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Abstract

Reserve funds are an understudied fiscal tool for cities. This study collected reserve fund data for California cities, separated by formal reserve funds (restricted or committed funds according to GFOA Statement 54 fund definitions, designated for general emergency or budget-balancing purposes) and informal reserve funds (all unrestricted general fund balance). In 2019, just under half of the cities in the study (45.5%) had some type of formal reserve fund. Nearly all cities had an informal reserve fund greater than 16% of total expenditures, which is the GFOA recommended minimum level. Panel regressions for fiscal years 2017 to 2019 show that cities decide whether to create a reserve fund and how much to save based on various financial factors, city characteristics, and institutional variables. The factors that explain variation in the presence and amount of formal reserve funds differ from informal reserve funds. Finally, this study demonstrated empirically through panel regressions that greater informal reserve funds are associated with an increase in the expenditures of a city.

Acknowledgements

<u>Introduction</u>

The COVID

expenditures, this project would indicate that reserves are a useful tool to help cities provide important services. In that case, city fiscal staff and city council members should be more interested in creating and maintaining reserve funds, especially in preparation for future emergencies.

Background

Local governments provide many important services, such as sanitation, health, water, other utilities, road infrastructure, and recreational facilities for their residents. All these services cost money, so cities must raise revenue. Municipalities have several sources of revenue, including property taxes, sales taxes, fines, charges and fees, transfers from state and federal governments, and bonds/accruing debt.

Many cities have a requirement or a goal to ensure that the total revenue for the fiscal year is greater than or equal to the expenditures for the year, otherwise known as balancing their budget. Balancing the city's budget shows residents that the city is managing their tax money properly while fulfilling their citizens' needs. Yet within the year and at the end of the year, budget deficits may arise when revenue does not equal or exceed expenditures. Month to month, some revenue sources and expenditures have a cyclical nature. For example, salaries for government workers are level throughout the year, but property taxes are collected and distributed to local governments only twice a year. Capital projects may increase expenditures for certain months. Other factors may affect revenue in the long-term; for example, declining economic conditions could lower revenue as people and firms spend less money, or population decline. Emergencies and sudden revenue changes may also create a budget deficit.

Some authors use the terms 'fund balance' and 'reserves' interchangeably. In this paper, I distinguish between the formal and informal ways of saving money for a city. The formal method creates a separate reserve fund with specific legislation or policies that may dictate the creation, amount, and/or use of the fund. Informal reserves, where there is no separate reserve fund, is measured in the form of the municipalities' unrestricted end-of-year fund balance.

Another way to categorize formal and informal reserve funds is by the way the fund was formed. The GASB (Governmental Accounting Standards Board) Statement No. 54 (Fund Balance Reporting and Governmental Fund Type Definitions) established four types of governmental funds: Restricted, Committed, Assigned, Unassigned. Restricted funds are money that can only be spent for a specific purpose defined by the city's constitution, external resource providers, or legislation (GFOA, 2009). Committed funds are also designated for specific purposes, but the fund is created by a formal action from the city's highest level of decision-making authority, such as the city council. Assigned funds indicate that a city intends to use the money for specific purposes, but the fund does not meet the requirements of a Restricted or Committed category. Finally, the Unassigned balance in the general fund is the classification for all other spendable funds. In this paper, formal reserve funds met either the Restricted or Committed classifications. Assigned and Unassigned funds were not included as a formal reserve fund.

There are specific subtypes of formal reserve funds that cities can create. One such type is a budget stabilization fund. These reserve funds are created specifically to counter year-to-year cyclical effects on the general budget, in the case that revenues do not cover expenditures. This type of fund is more commonly found in state government's budgets than in local

Literature Review

While there is a limited number of studies on the incidence and impact of reserves for

local governments, this paper will review literature on formal reserve funds, unrestricted general

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future. The expenditure tradeoff and delayed benefits complicate the decision making for how much reserves to hold, especially for formal reserve funds.

The political aspect builds on Tiebout's paper (1956) on how migration between cities is affected by the fiscal policies of each city. Tiebout proposed that people would move to the city that most closely matched their preferences for taxation and spending, given there is variation in fiscal policies between all the cities. By moving, people "vote with their feet" to influence fiscal policies, such as the amount of savings a city will hold. This theory implies that the amount of reserves held (both formal and informal) should vary, based not only on the types of risk present, but also on voters' different preferences for saving versus spending.

To begin assessing formal reserve savings in cities, Wolkoff conducted a survey of large cities in the United States. Of the 27 cities that responded, only 6 had a formal rainy day or contingency reserve fund (Wolkoff, 1987). According to the author, he limited his sample pool because large cities were more likely to have a formal rainy day fund. However, the limited scope of the study makes it difficult to draw conclusions about formal reserve funds in the 1980s.

By 2000, Anita Lawrence conducted a more expansive survey for all California cities with populations of 10,000 to 200,000. Out of 142 respondents, 33% had a formal, adopted written reserve policy for their city. 28% of the cities had a reserve policy that was informal, and 8% responded that they had a reserve policy, but in another form besides formal and informal. Formal reserve policies typically set a goal for the minimum fund amount, in either a fixed dollar amount or as a percentage of the city's total revenue or expenditure. For the California cities in Lawrence's survey, cities that set a dollar amount for their formal reserve policies had a minimum range from $1 to $20 million. For reserves measured as a percentage of revenues or

expenditures, policies ranged from 2% to 150%. Lawrence's survey results counter other literature that claim formal reserve funds are rare in local governments. For example, Hembree and Tyer (1999) specifically mention that formal reserve funds are unlikely to be found in North and South Carolina cities.

Lawrence (2000) asked the financial officers to rank the importance of certain criteria in determining reserve policy size. The criteria were cash flow, exposure to natural or other disasters, exposure to economic conditions, vulnerability to State actions which results in reduction of income, and other factors. Over half responded that exposure to economic conditions was either most important or more important. Vulnerability to state actions and exposure to natural disasters were mostly listed around average importance, while cash flow was generally evenly spread between the rankings.

Besides this survey, one other work specifically studies what factors influence the level of formal reserve funds for cities. Working off of Wolkoff's (1987) theories, Snow, Gianakis,

that residents who dislike the local government overtaxing them will also dislike the forced

saving inherent for formal reserve funds.

Wolkoff's (1987) first study into budget stabilization funds for municipalities brought

interest to formal reserve funds. However, Lawrence (2000) and Snow et al. (2015) remain some

of the only subsequent papers that study formal reserves funds at the city level. Additionally,

Snow et al. (2015) do mention that stabilization funds did not seem to decline in many

Massachusetts cities during recession periods, but otherwise they did not study the impact of

reserve levels on city spending.

Unrestricted Fund Balances

Like formal reserve policies, the GFOA published a Best Practices resource for

unreserved general fund balances, which recommended that "general-purpose governments,

regardless of size, maintain unrestricted budgetary fund balance in their general fund of no less

than two months of regular general fund operating revenues or regular general fund operating

expenditures." This Recommended Practice 4.1 was published in 2015, from the GFOA's

National Advisory Council on State and Local Budgeting. An unrestricted fund balance equal to

two months is approximately 16-17% of a city's revenues or expenditures, similar to the

GFOA's recommendation for formal reserve policies.

There is significantly more literature on reserves in the form of unrestricted fund balances

for local governments. Part of this may be a representation of municipal finance practices;

Hembree and Tyer (1999) found that North and South Carolina cities rely on their unassigned

fund balances as a reserve and rarely budget formal reserve funds. Positive fund balances

typically range from 20% to 50% of total expenditures in the South Carolina cities, and the mean

percentage is even higher for North Carolina cities. By sorting the cities and fund amounts into size categories, the authors observed that the population of the cities had a negative relationship with the percentage of fund balance. Besides total population and whether cities provided electric service, this study did not include other variables that might affect the amount of fund balance.

Arapis and Reitano (2018) studied the unassigned fund balance for 103 cities in Florida with populations above 5,000 (financial data was missing for the remaining 111 cities). Over an 8 year period, from 2005 to 2012, 70% of the cities held a fund balance higher than 15% of cities' operating expenditures, which is the GFOA's recommended minimum amount, according to Arapis and Reitano. Arapis and Reitano (2018) used a slightly different range for fund balances than the minimum range recommended by the GFOA in their Best Practices for Fund Balances (2015). However, it is still notable that fewer than 10% of the cities in the Florida study had lower than the minimum fund balance (5%). This adds to the positive fund balance ranges in North and South Carolina cities from Hembree and Tyer (1999).

Arapis and Reitano (2018) also studied the variables that may affect unrestricted fund balance. They categorized the level of fund balances by below, within, and above 5-15% of operating expenditures, and used a regression to estimate the probability of each category happening before (2005-2007), during (2008-2009), and after the Great Recession (2010-2012). They found that property taxes are a statistically significant variable during and after the Great Recession for cities with a fund balance level below 5%. As property taxes increased, the likelihood of the fund being below the GFOA level and during or after 2008 increases. The authors included net enterprise transfers, which is the net amount transferred from enterprise, or

Methods

Why California

This paper provides an empirical counterpart to Anita Lawrence's survey based data in 2000. The survey focused on cities with populations of 10,000 to 200,000 in California. Reserve funds may also be more important to cities in California; Lawrence writes about certain state laws that restrict California cities' ability to increase their income. In the case of a future budget imbalance, cities will have a harder time increasing revenue, so they must either cut expenditures or use reserve funds. Additionally, California has two fiscal data sources which are useful for this study – the state Controller's Financial Transactions Report and the Auditor's Local Government High Risk program. Finally, collecting the formal reserve data by hand takes time, so choosing one state helped to narrow the scope of the study.

Presence of Reserves

The goal of this research is to understand what influences the level of reserve funds and unrestricted general fund balances for cities in California, then to determine the impacts of the level of reserve funds on cities' expenditures.

The first step to understanding the level of formal and informal reserves in California cities is to describe the number of cities that have a formal and informal reserve.

For formal reserves, my hypothesis is that most cities had a formal reserve fund in 2020-2021, because Lawrence found that 33% of California cities had a formal reserve fund in 2000 (Lawrence, 2000), and more cities may have added reserve funds since then.

For informal reserves, my hypothesis is

and median household income could lead to a lower perceived need for stabilizing mechanisms like reserve funds, so a city may save less.

In 2019, Pew Research Center found differences in anti-tax sentiment between the surveyed Republican and Democratic voters; "A majority of Republicans (56%) say they pay more than their fair share in taxes, compared with 38% who say they pay about the right amount." (Pew Research, 2019). Snow et. al (2015) hypothesized that anti-tax communities would be more hesitant to create savings, since it seems like excess tax money that is wasted. If Republican voters have more anti-tax sentiment, the percentage of Republican voters should show a negative association with the presence of reserve funds.

Besides the voter registration parties, I added a dummy variable for charter versus general law cities. By becoming a charter city, a city is no longer bound to the state's general laws for municipal affairs. Although municipal affairs are not strictly delineated, a charter city has more control over the form of government, public contracts, finance and taxing power, and more. As the legal team from the League of California Cities succinctly writes, "A charter maximizes local control." (League of California Cities, 2001). The additional control could influence reserves by allowing cities to save more without too much oversight from the state.

$$Formal\ Reserve\ Fund = \beta_0 + \beta_1(Fiscal\ Characteristics) + \beta_2(SE\ Characteristics) + \dots$$

Effect of Reserves on Expenditures

The third part of this research asks the all-important question: Does saving reserves benefit cities? Since this study centers around the fiscal years 2017 to 2019, it is not possible to estimate the effect of reserves on a major fiscal shock, like COVID-19. Instead, the effects of reserves (X_t) will be measured on the total expenditures per capita in the following year (Y_{t+1}). Wang and Hou (2012) use a similar regression, except with total expenditures per capita (Y_t) as the dependent variable and previous year fund balances (X_{t-1}) as the independent variable.

I hypothesize that unrestricted fund balances will have a positive correlation with the following year's expenditures (governmental expenditures, not including enterprise/business-type activities). Unrestricted fund balances are essentially free cash that cities can spend, allowing cities to spend more than revenues taken in and still balance the budget. A city that has more informal reserves in one year may spend more in the following fiscal year.

I hypothesize that formal reserve funds will have a negative relationship with expenditures for the following fiscal year. This would show the tradeoff that Wolkoff (1987) describes, between spending more now or saving the money to spend in the future. Cities that increase their formal reserve funds will have less to spend in the following fiscal year. Oppositely, in a period of fiscal stress, reserve funds may decrease if used to cover lost revenue, while expenditures increase or stay stable.

I used a panel regression to help control for differences in cities and fiscal years. I used three regression specifications: one with the next year's expenditures (Y_{t+1}) on reserves and revenues, then another with the same variables plus controlling for the city characteristics

The socioeconomic variables that help to characterize the cities were downloaded from US Census American Community Survey, or ACS, on the IPUMS National Historical Geographic Information System (NHGIS), a data integration software by the University of Minnesota. These variables include median home value for owner-occupied housing, percentage of the population that moved into a different house in the past year, percentage of total population under the federal poverty line, ethnicity (Black, Asian & Pacific Islander, and Hispanic as percentage of total population), unemployment rate as a share of total labor force, and total population.

The percentage of voters by party was from the website StatewideDatabase. I used the number of registered voters in the general election, downloaded at the zip code level then merged to city data. Because the general election only happens during even years, I also used the party registration data to represent party distributions for the previous year.

The charter versus general law city data is from the Construction Industry Force Account Council (CIFAC). Their website has a list of all California cities by county, and whether each city is a charter or general law city. The data was last updated on October 13, 2021.

Table 1. Descriptive Statistics of All Variables for FY 2019.

Formal reserve amount ($ in thousands)	0	5285.541	14435.46	27985.76	21625	365830
Unrestricted general fund balance ($ in thousands)	-16545	4897.391	14516.4	35353.03	33897.66	2390787
Governmental expenditure (t+1) ($ in thousands)	195.076	12951.41	37684.96	115759.5	88342.61	9102910

Findings

Presence of Reserves

Table 2.a Formal Reserves

|	
All CA municipalities in fiscal year 2019	482
Total municipalities for which formal reserve data was collected	209
Cities with a formal reserve	93 (45.5% of collected)
Cities with NO formal reserve	116 (55.5% of collected)

Table 2.b Informal Reserves

Total municipalities for which unrestricted fund balance data is available in 2019	467
Cities with an informal reserve of 16% of expenditures or less	69 (14.8% of available)
Cities with an informal reserve greater than 16% of expenditures	397 (85.2% of available)

Tables 2.a and 2.b show the number of cities that have a formal reserve fund and an informal reserve fund in the fiscal year 2019.

For the study cities in the fiscal year 2018-2019, 45.5% had a formal reserve fund policy and money in the reserve fund. This is less than my hypothesis of greater than 50%. However, more cities have established a formal reserve fund policy since Lawrence's study in 2000. A larger percentage of cities have a formal reserve fund in 2019 (45.5%) than in 2000 (33%).

On the other hand, the majority of all California cities held more than 16% of expenditures in their unrestricted general fund balance in 2019. Over 85% of cities had a balance greater than 16% of governmental expenditures, which supports my hypothesis. This adds to the findings of existing studies, namely Hembree and Tyer (1999) and Arapis and Reitano (2018), where most cities meet this minimum threshold.

The two graphs below depict the distribution of reserve fund sizes, as a fraction of total governmental expenditures, in 2019. For formal reserves, the majority of the reserves are below 20% of the city's expenditures. On the other hand, the magnitude of informal reserve funds is much greater, sometimes even adding up to over 100% of a city's expenditures. Most of the informal reserve fund balances are still equal to less than 50% of the cities' expenditures.
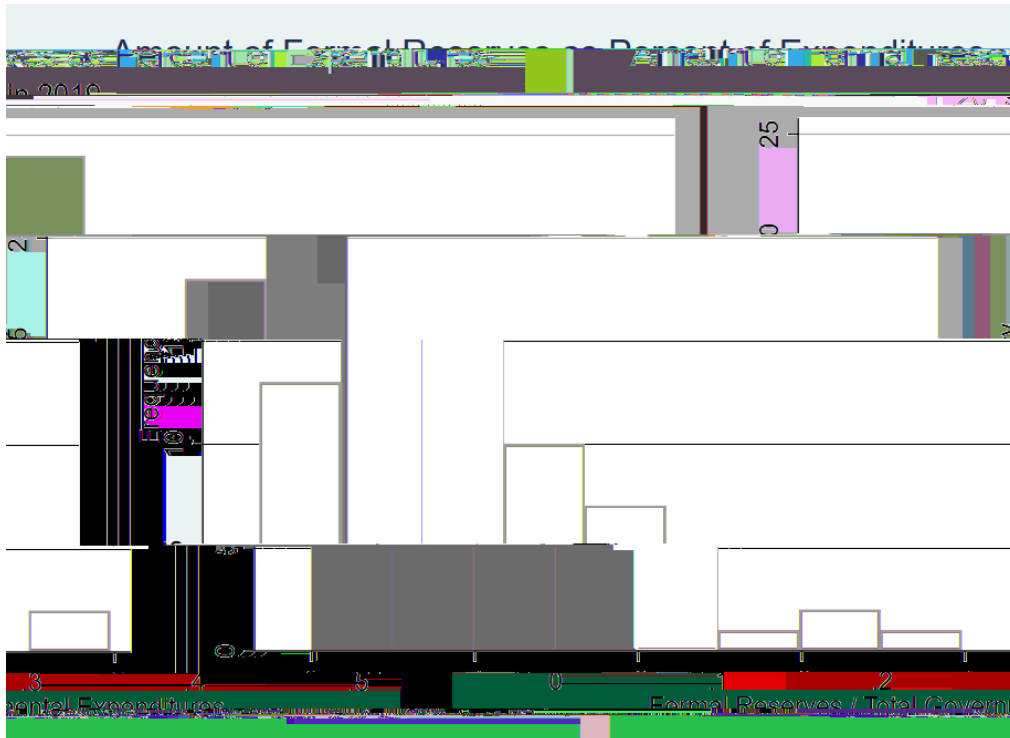
Graph A. Histogram of Formal Reserve Amount, as a fraction of Total Governmental Expenditures in 2019.
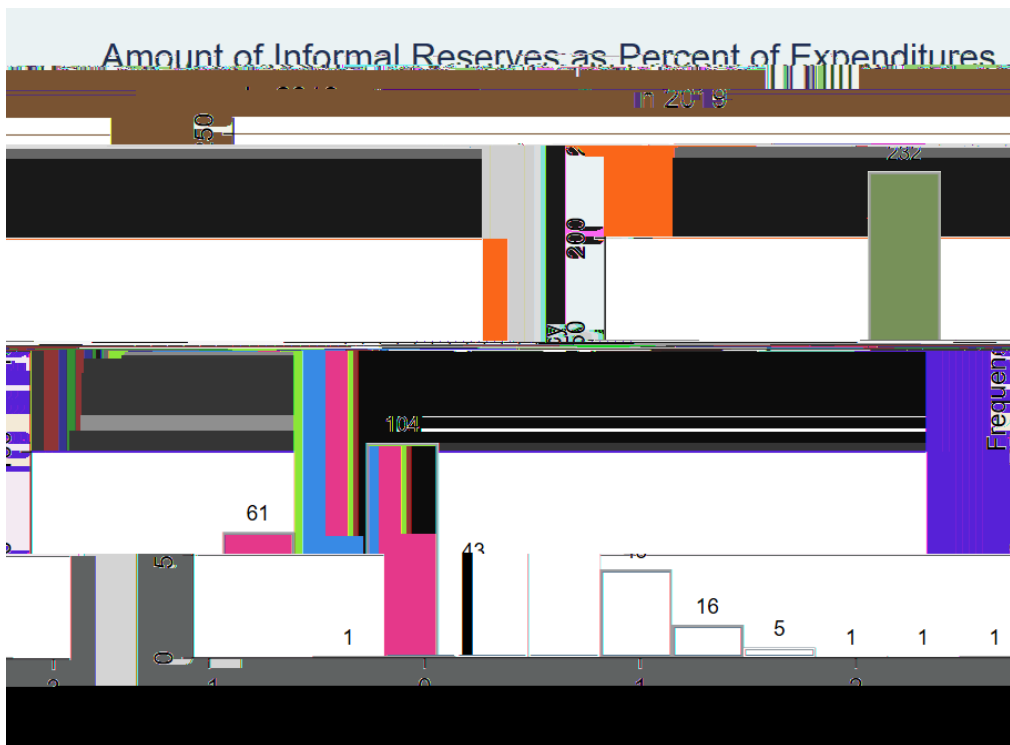
Graph B. Histogram of Informal Reserve Amount, as a fraction of Total Governmental Expenditures in 2019.

City Characteristics and Reserve Amounts

Estimating the Presence of Reserve Funds: Logistic Regressions

To test for the presence of a reserve fund, I used a logistic regression on each dummy variable. In Table 3, the first regression is on the presence of any reserve fund for the cities where reserve data was collected. The second regression is on the presence of an unrestricted general fund balance (the informal reserve fund) greater than 16% of the city's expenditures. Both regressions are pooled for the three fiscal years from 2017 to 2019, and the estimated coefficients are listed as the odds ratio.

The first column for the presence of a formal reserve fund shows that only three of the seventeen variables are statistically significant at the 90% level. The percent of households that moved in the city is a statistically insignificant variable, suggesting that the time mismatch between current saving and future spending does not factor in heavily when a city decides whether to hold formal reserve funds.

Of the variables that measure a part of future need, intergovernmental transfers and the unemployment rate are statistically significant. As the fraction of revenue from intergovernmental transfers increases, it decreases the odds for a city to have a formal reserve fund by a small amount, 0.955. This counters the hypothesis that higher reliance on intergovernmental transfers would be positively correlated with reserve funds, assuming that transfers are seen as an unstable revenue source. Increasing the unemployment rate also decreases the odds for a city to have a reserve fund, by 0.853. This is a greater magnitude than intergovernmental transfers.

The percent of that is Black statistically significant as well. As the Black population

increases, the odds of having a formal reserve fund. Otherwise, none of the other explanatory

variables are statistically significant in this logit regression.

Table 3. Logit regression. Pooled fiscal years 2017-2019, robust standard errors.		
	Y = Presence of Reserve Fund	Y = Presence of Unrestricted Balance above 16%
	Odds Ratio (SE)	*Odds Ratio (SE)*
Governmental Revenue ($ in thousands)	1.000	1.000^
	(0.000000731)	(0.000000118)
Sales Tax (% of Total Revenue)	1.006	1.033^**
	(0.0137)	(0.0115)
Charges for Service (% of Total Revenue)	0.990	0.962^**
	(0.0171)	(0.0128)
Property Tax (% of Total Revenue)	1.025	0.977
	(0.0160)	(0.0143)
Intergovernmental Transfers (% of Total Revenue)	0.955^**	0.957^**
	(0.0158)	(0.0122)
Debt Obligations ($)	0.996^	0.997^*
	(0.00196)	(0.00138)
Pension Obligations ($)	1.001	0.991^**
	(0.00249)	(0.00241)
Total Population (in thousands)	1.002	0.998^**
	(0.00339)	(0.000732)
Population that moved (% of Total Population)	1.032	0.985

	(0.0255)	(0.0143)
Population Under the Federal Poverty Line (% of Total Population)	1.184^*	1.067
	(0.0905)	(0.0587)

statistically significant variables at the 0.1 level. The percent

Estimating the Amounts of Reserve Funds: Linear Panel Regressions

After exploring the relationship between city characteristics and the presence of a reserve fund, the next step is to use the same explanatory variables but estimating the dollar amount in the formal and informal reserve funds. Table 4 shows the two panel regressions with formal reserve funds in the first column and informal reserve funds in the second column.

Table 4. Panel linear regression. Cities in fiscal years 2017-2019, robust standard errors.		
	Y = Formal Reserve Fund (in thousands)	**Y = Informal Reserve Fund (in thousands)**
Governmental Revenue ($ in thousands)	0.0134***	0.162**
	(0.00407)	(0.0565)
Sales Tax (% of Total Revenue)	703.0*	204.1
	(311.9)	(120.0)
Charges for Service (% of Total Revenue)	-259.0	-183.3
	(195.8)	(184.0)
Property Tax (% of Total Revenue)	721.7	363.3
	(570.2)	(207.2)
Intergovernmental Transfers (% of Total Revenue)	-397.6	-38.78
	(269.1)	(52.94)
Debt Obligations ($)	2.613	141.6
	(37.30)	(83.74)
Pension Obligations ($)	-113.2*	-6.685
	(47.51)	(44.28)

	(397.9)	(189.0)
Population Under the Federal Poverty Line (% of Total Population)	-3623.0**	-2132.7
	(1320.7)	(1109.9)
Unemployment Rate (% of Labor Force)	-2383.7	-1798.6**
	(1411.0)	(666.7)
Median Home Value ($ in thousands)	-4.349	6.501
	(9.593)	(6.414)
Black Population %	90.44	577.9
	(428.0)	(391.7)
Hispanic Population %	374.7**	318.5*
	(143.6)	(148.3)
API Population %	356.4*	827.2***
	(154.8)	(209.1)
Republican Voters (% of Registered Voters)	3.959	241.7
	(236.5)	(154.2)
Charter (1) vs General law (0)	7504.8*	24183.0**
	(3692.3)	(8147.6)
Constant	-10681.8	-13106.8
	(18088.9)	(11312.5)
N	201	1164
Standard errors in parentheses		
* p<0.05 ** p<0.01 *** p<0.001		

For the amount in each formal reserve fund, there are eight statistically significant

variables at the 0.05 level. The percentage of the population that moved within the past y Tw [(m)1c9mwe(e)1 (

correlation is the opposite of my hypothesis that a higher migration will lead to lower savings because current residents may not benefit from current saving.

An increase in the total governmental revenue is correlated with an increase in formal reserve amounts, which supports my hypothesis. Since both variables are calculated in the thousands of dollars, a $100,000 increase in total revenue is associated with a $1,340 increase in formal reserve amounts. The magnitude may seem small in comparison to other fiscal variables, but the median for total governmental revenue is $50,414,500, so the coefficient is still meaningful when estimating how much a city will save. Another fiscal variable, the fraction of revenue from sales tax, is also significant. Increasing revenue from sales tax by one point percentage is correlated with a $703,000 increase in the formal reserve amount. Both variables support my hypotheses on a city's ability to fulfill needs and perceived revenue source stability.

The poverty percentage and pension obligations both have negative correlations with formal reserve funds. As the percent in poverty increases by one, the estimated decrease in reserve amount is $3,623,000. The magnitude of this variable is much greater than the other explanatory variables. A contrasting example is pension obligations as a percentage of total governmental revenue. A

Finally, the Hispanic population and Asian & Pacific Islander population have a positive relationship with formal reserve amounts, of similar magnitude. A one percent increase is correlated with a $374,700 and $356,400 increase, respectively.

For the amount in the unrestricted general fund balance, there are seven statistically significant variables at the 0.05 level, as shown in the last column on Table 4. The percent of the population that moved into the city within the past year has a positive correlation to formal reserve funds. As the percent increases by one point, the informal reserve fund increases by $421,000. This does not support my hypothesis that more migration would decrease the incentive to save.

A $100,000 increase of governmental revenue is correlated with an increase of unrestricted fund balance of $16,200, which is larger than the coefficient for total governmental revenue on formal reserve funds. Similarly, the coefficient is smaller than other explanatory variables. However, in this regression, none of the revenue source variables are statistically significant.

Instead, the total population and unemployment rate have a statistically significant correlation with informal reserve fund amounts. As total population increases by a thousand, the informal reserve fund decreases by $379,100, holding all other variables constant. Compared to total revenue, the magnitude of total population is greater. The sign of this coefficient is opposite of what I expected for the total population. The unemployment rate also has a negative correlation, with an even larger magnitude. A one point increase of the unemployment rate is associated with a $2,383,700 decrease in the unrestricted fund balance.

Like formal reserves, the charter city variable is statistically significant and again has the largest magnitude of the regression for informal reserves. A charter city is associated with a $24,183,000 increase in unrestricted general fund balance. This is a very large magnitude, given that the median of unrestricted fund balance is $12,860,020.

Overall, there are differences in the statistically significant variables for the estimates of presence versus amounts of reserve funds. Some of the explanatory variables have coefficients that support my hypotheses. Other variables suggest that cities are being more reactive in spending rather than proactive in saving. For example, the unemployment rate has a negative correlation with the presence of formal reserve funds, the amount of formal reserve funds, and the amount of informal reserve funds. I had expected to see an increase in the reserve funds as the unemployment rate increases, since cities might see the need to increase expenditures in the future. However, the negative correlation for unemployment rate suggests that cities with a higher unemployment rate may already be using reserves or contributing less to reserve funds, resulting in lower reserve amounts.

Another variable with the opposite correlation than expected is the share of intergovernmental revenue. In both reserve presence regressions, the intergovernmental revenue decreases the odds of a city having a formal or an informal reserve fund. My hypothesis rested on the assumption that intergovernmental revenues are more unstable than other revenue sources; if the state or federal government was tight on revenue, the amount of intergovernmental transfer revenue going to the city might decrease, putting the city at risk of a budget imbalance. This phenomenon does not seem to be the case in these regression estimates. One reason for this

negative correlation may be that intergovernmental transfers are already designated for certain

expenditures, so cities are unable to place any of that increase in total revenue into a reserve

fund. For example, the CARES Act stipulated that the payments to states and some

municipalities were only used for necessary expenditures. (U.S. Department of the Treasury,

2021). If intergovernmental revenues increase total revenue but do not increase the funds cities

can use for reserves, the lower odds for a reserve fund makes sense.

Table 5. Panel regression. Cities in fiscal years 2017-2019, robust standard errors.

Y =

The additional specifications in the remaining columns of Table 5 support the findings in the first regression. The second regression estimates the relationship between fund amounts and total revenue with total expenditures in the same fiscal year. The third regression adds the fiscal, socioeconomic, and institutional variables to the first regression, where total expenditures in the next fiscal year is the dependent variable. The same sign and the statistically significance for the formal and informal reserve amounts holds the same through each variation of regression. In the third regression with additional control variables, the informal reserve fund coefficient increases, so that a $1,000 increase is associated with a $1,141 increase in expenditures the following year.

Policy Application

There are three main policy implications from the results of this study on the effectiveness of a mandated minimum reserve policy from the state for cities, the state of transparency in municipal reserve funds, and the need for further research on the budget balancing effectiveness of formal reserve funds.

One of the main questions for the policy application of this study is whether California state should mandate cities to establish a reserve fund policy. A state mandated policy would ensure that more cities hold a formal reserve fund and greater informal reserve funds, with the goal to help stabilize city finances. Currently, the state only requires school districts to save a minimum amount in a formal reserve fund, but not cities. The recommendation from the GFOA seems to be the leading resource for cities in developing a reserve fund policy. In fact, six of the cities mention a recommendation from the GFOA in their reserve policies, including Stockton, Vallejo, South San Francisco, Chowchilla, San Buenaventura, and Berkeley. There seems to be

some confusion on the exact recommendation from the GFOA - Vallejo and South San Francisco both quote the minimum as 15% instead of 16.67%, or two months of expenditures or revenues (See Appendix A). Regardless, there is evidence that cities are using the GFOA's resources when creating reserve fund policies.

In order to evaluate whether it would be beneficial for the state to create a minimum reserve fund policy, I should first establish that reserves are useful. As this study shows, an increase in the unrestricted general fund balance is correlated with an increase in expenditures. Assuming that the purpose of reserves is to boost municipality expenditures, informal reserves are useful.

The next step is to establish whether a state mandated policy would be useful. Many cities are already saving in both formal and informal reserve funds. As Table 2 listed, 97.2% of all cities have an informal fund amount greater than the GFOA recommended amount, 16% of expenditures. I also collected data on informal reserve policies, where a city has a minimum

types of risk or want to create more specific types of reserve funds instead of leaving it as unrestricted general fund balance.

On the other hand, the expenditure regressions during the fiscal years 2017 to 2019 did not reveal a statistically significant correlation for formal reserve funds. Showing the effect of formal reserve funds on expenditures in this period could be more difficult because committed and restricted funds can only be used for a specific purpose and may require approval from the city council or other authority. During the fiscal years 2017 to 2019, it is likely that most cities did not have major shocks that might require a use of the formal reserve fund. In the subsequent years, when COVID-19 impacted all cities' spending and ability to collect revenue, cities may have been more likely to use reserve funds. In the future, it would be useful to study the effects of reserves on expenditures starting in 2020.

The lack of evidence that formal reserve funds are useful has implications for measuring fiscal condition and stress. Fiscal condition essentially measures the ability for a municipality to pay current and future expenditures, using fiscal measures like revenues per capita, capital expenditures, deficits, debt, and other fiscal factors.

An alternative recommendation arising from this paper is the need for better data transparency on reserves. Tracking the amount of formal reserve funds cities are holding would make future studies on effects of reserves at the city level easier. Also, one could argue that including formal reserves would provide a fuller picture of key financial indicators for the Auditor's Office. As mentioned previously, the California State Auditor's Office focuses on fiscal indicators only to evaluate cities' fiscal health and monitor for fraud or mismanagement. While informal reserve funds are included in the fiscal indicators, formal reserve funds are not.

The California State Controller does not require cities to report formal reserve funds in the

annual Financial TransactiDooReports either. However, if formal reserves are not making an

Table 7. T-Test for Difference in Means of Formal Reserves, by Fiscal Year.

H$_0$:	H$_A$:	Difference	t =	Pr =
Mean(2019) - Mean(2020) = 0	Mean(2019) > Mean(2020)	5,863,215	0.8135	0.2085
Mean(2019) - Mean(2021) = 0	Mean(2019) > Mean(2021)	1,004,834	0.1044	0.4585
Mean(2020) - Mean(2021) = 0	Mean(2020) Mean(2021)	-4,858,381	-0.6400	0.5230

Conclusion

Formal reserve funds seem to be an understudied fiscal tool for cities, based on the limited amount of literature. This study collected reserve fund data for California cities, partly to gauge how many cities have established restricted or committed funds (according to GFOA

As mentioned above, data availability constrained this study's ability to test the effects of formal reserves. Another element to consider is the possibility of measurement error when collecting the formal reserve data. In this study, a formal reserve fund is defined as a restricted or committed fund, with the primary purpose of helping to balance the city's budget when needed. It is possible that some reserve funds were improperly categorized because there is no standard language for reserve funds, besides the GFOA guidance on fund types from Statement 54. Some cities provide more language on the use and details of reserves compared to other cities. Further, by defining informal reserve funds as total unrestricted general fund balance, there may be some overlap between formal and informal funds. Although the California Auditor's office defines reserves as unrestricted fund balance, it may be more appropriate to only include assigned and unassigned fund balance in the informal reserve fund balance, given that committed funds are more difficult to reappropriate. In a policy brief about informal reserve funds and municipal bankruptcies, one author considers only the assigned and unassigned general fund balances as the informal reserve fund (Joffe, 2020). This definition of reserve funds is also used by the Florida State Auditor, while the Ohio state auditor only considers the unassigned fund balance. In future studies on city reserve funds, researchers may consider measuring formal and informal reserves differently.

Regardless, this study is a start to describing empirically

Appen

| (397.9) | (189.0) | (718.0) | (452.9) | |

Works Cited

Arapis, T., & Reitano, V. (2018). A Glimmer of Optimism in Government Savings Accumulation? An Empirical Examination of Municipal Unassigned Fund Balance in Florida. *Public Finance Review*, *46*(3), 389–420. https://doi.org/10.1177/1091142116643386

Board of Governors of the Federal Reserve System. (2020, April 9). *Federal Reserve takes additional actions to provide up to $2.3 trillion in loans to support the economy*. Board of Governors of the Federal Reserve System. https://www.federalreserve.gov/newsevents/pressreleases/monetary20200409a.htm

Boarnet, M., Rodnyansky, S., & Austin, B. (n.d.).

Marlowe, J. (2005). Fiscal Slack and Counter-Cyclical Expenditure Stabilization: A First Look at the Local Level. *Public Budgeting & Finance*, *25*(3), 48–72. https://doi.org/10.1111/j.1540-5850.2005.00367.x

Pew Research. (2019, December