The Effects of Underfunded Legislative Mandates on Fiscal Stability of School Districts

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This study examines the fiscal stability of Pennsylvania public school districts within the context of underfunded pension and charter school mandates. Results indicate that mandated pension and charter school expenditures are negatively associated with unassigned fund balances during the period 2011-17. Differential effects are identified across years and locale. While pension expenditures have negative effects on fund balances beginning 2012-13, districts located within towns, rural areas, and suburbs experience negative effects related to charter school expenditures. Policy issues include tax-shifting, public financing of education, access to bond financing, as well as institutional sustainability.

Keywords: Public Education, Underfunded Mandates, Pensions, Charter Schools, Fund Balances

INTRODUCTION

In recent years, the Commonwealth of Pennsylvania implemented major legislation expected to result in significant cost increases for public school districts across the state. First, the Pennsylvania legislature enacted the 1997 Charter School Law, which requires public school districts in Pennsylvania to pay for each student residing within their districts who attends a charter school. At their inception, charter schools were primarily a threat to urban school districts, where brick and mortar options were readily available. However, cyber charter schools are now available to all students across Pennsylvania. Indeed, 69 percent of districts report increased cyber charter expenses, while 80 percent tapped their fund balances in the 2016-17 budget (PASA-PASBO 2017).

Second, during a booming stock market and pension surplus in 2001, Pennsylvania Governor Tom Ridge and the Legislature passed Act 9, which provided a 50 percent increase in pension benefits for legislators by boosting their multiplier from 2.0 to 3.0 percent and from 2.0 to 2.5 percent for teachers along with other state workers. The legislation included a retroactive application and reduced by half the time required to qualify for a pension, from 10 to 5 years (Weckselblatt 2017). Act 38 subsequently enhanced benefits for retirees initially excluded from Act 9.

Pension mandates have pushed contributions by school districts to 32.57 percent of salaries, which will further increase in future years. While Pennsylvania and local school districts equally share pension contributions, such steep increases have resulted in pensions consuming over 11 percent of total school expenditures in 2016-17, up from about 2 percent over the past 8 years (PSBA 2017). Although Pennsylvania recently attempted to address the pension crisis by approving Act 5, which will move many state and public school employees toward 401(k) retirement structures, this legislation does not address existing unfunded liabilities at the state level that are estimated to exceed $60 billion (Calvert 2017).

In the midst of these legislative mandates, Pennsylvania's funding for education has essentially remained flat, which exacerbates distressed school budgets. Moreover, significant variations in state funding can occur from one year to the next. However, the majority of funding for districts continues to originate at the local levels, where there can be large variability in the strength and stability of local tax bases. This environment often results in educational funding differences across Pennsylvania with "rich" and "poor" school districts.

Thus, charter school and pension legislation, combined with flat state funding for education in Pennsylvania, creates underlying conditions that may result in fiscal distress for districts across the state. While underfunded mandate expenses continue to increase, school districts are coping by drawing upon reserves, increasing local taxes, reducing non-mandated expenditures, or a combination of these actions. Indeed, about 75 percent of Pennsylvania school districts are expected to experience shortfalls of revenue versus expenditures by 2020 (Hartman and Shrom, 2015) and 90 percent of school districts have implemented local tax increases over the past 5 years (Erdley 2015). In addition to local revenue increases, schools are cutting teachers, programs, and other services. For example, districts left 14,000 positions unfilled throughout Pennsylvania during 2011-12 (Micek 2012).

A district's fund balance, or reserves, can also affect its credit rating and borrowing cost. For example, Moody's credit rating agency has issued junk status credit ratings to several school districts in Western Pennsylvania due to such issues. Indeed, Pennsylvania school districts provide 20 percent of Moody's junk bond ratings, largely due to mounting pension payments combined with charter school payments (Ferral 2015). In 2014, Moody's Investors Service also downgraded Pennsylvania's credit rating due to unfunded pension liabilities (PSBA 2017).

This combination of unstable funding and underfunded mandates present an opportunity to examine the effects of mandate expenditures on the unassigned (unrestricted) fund balances for public school districts. In addition, this paper investigates differential effects of underfunded mandates across different categories of school districts for the six-year period 2011-17. The fiscal stability effects of underfunded pension and charter school mandates has implications for shifting tax burdens across jurisdictions, enterprise risk management and bond financing. Quality of educational opportunities and student preparation for higher education may also be jeopardized through budgetary stress imposed by underfunded mandates. Similar issues are also affecting public higher education in Pennsylvania as well as other states.

RELATED LITERATURE

Imazeki and Reschovsky (2004) examine whether the federal No Child Left Behind Act of 2001 was an unfunded mandate for states. Using data from Texas, they find that the costs incurred by school districts greatly exceeded the federal funding provided. With regard to pension funding, Mahoney (2002) studies underfunding of state and local government retirement systems and notes that Pennsylvania's pension funding deficiencies reach back to 1981, which led to adoption of Act 205. In addition, Chaney, et al. (2002) examine whether or not fiscal stress and balanced budget restrictions at the state level affects public retirement funding. Consistent with their findings, Pennsylvania, which is fiscally stressed and maintains a balanced budget requirement, has not achieved sufficient pension funding. To compensate, states may shift funding deficiencies to local levels through underfunded mandates.

Arapis, et al. (2017) examine unassigned fund balances for school districts before and after the Great Recession. They note that one-half of school districts were out of compliance with the limitations on unassigned fund balances, having accumulated higher levels to provide for greater financial flexibility. Arapis and Reitano (2017) state that the unassigned fund balance is the "true savings" available for any purpose. As special-purpose entities, school districts may use unassigned fund balances to compensate for revenue shortfalls and unexpected expenditures. Indeed, a recent survey indicates that 70 percent of school districts plan to use reserves to balance their budgets (Daniels 2013). Thus, unassigned fund balances are an important measure of financial flexibility and fiscal stability. Indeed, Mensah and Werner (2003) use unrestricted net assets to total assets as a measure of financial flexibility within the context of examining cost inefficiency within higher education.

Finally, Collins (2016) states that several Pennsylvania school districts have local tax burdens that exceed 10 percent of personal income, over twice the average school tax burden in the state. As noted, Pennsylvania districts are heavily dependent upon local taxes and the state ranks seventh in the nation with respect to dependence on local taxes for public school funding. This suggests that local taxes tend to be a far more important and stable funding source than either state or federal funding.

Although fund balances, along with local tax revenues, are critical in bridging the gap between expenditures arising from underfunded legislative mandates, effective performance management systems (PMS) can be useful as well. Gorden and Fischer (2018) present a framework for developing a PMS to better control administrative spending within public higher education. PMS can be an effective tool to promote continuous improvement, provide insight regarding operational efficiency and effectiveness, and enable educational entities at all levels to more proactively manage costs.

No prior studies examine fiscal stability within the context of underfunded legislative mandates. Specifically, this paper examines the incremental effects of pension and charter school expenditures mandated by legislation on the unassigned fund balances of public school districts. This issue is important from a fiscal sustainability and bond rating perspective. It also has important public policy and risk management implications for entities that are subject to legislative risk from underfunded mandates.

RESEARCH DESIGN

Perrin (2016) provides descriptive analysis regarding how well different types of school districts can support the costs of underfunded mandates, such as pension costs and charter school expenditures. For example, school districts located within small towns and rural areas may have less capacity to tap a primary funding source, local property taxes, to sustain operations. Moreover, De Luca (2006) suggests that differential fiscal health arises across different categories of districts.

This study classifies school districts using "urban/rural" classifications available from the National Center for Education Statistics (NCES). The urban-centric locale code system consists of 12 locale codes and include 'city' and 'suburban' (classified by population size into small, midsize and large), and 'town' and 'rural' (classified by proximity to an urbanized area into fringe, distant and remote). Such partitioning of school districts using NCES codes facilitates examination of differential effects of underfunded mandates on changes in fund balances across locales.

Fund balance represents net worth and equals the difference between assets and liabilities (Arapis and Reitano 2017). Total fund balance within public school districts consists of three different categories: (1) committed fund balance is formally designated for specific uses by a school board; (2) assigned fund balance is intended for a specific purpose by a committee of the school board; and (3) unassigned fund balance, which is available for any purpose (PSBA 2017). Only unassigned fund balances provide the financial flexibility to deal with unexpected events and help to maintain solid credit ratings.

The Government Finance Officers Association (GFOA) emphasizes that adequate levels of fund balances are essential to mitigate risks and to maintain stable tax rates. Such reasons underlie the Pennsylvania School Boards Association (PSBA 2017) recommendation that school districts maintain an unassigned fund balance equal to 5 to 10 percent of expenditures. However, the Pennsylvania School Code restricts school districts from raising property taxes should unassigned balances be considered too high.

Hypotheses

Whenever states impose unfunded, or underfunded, legislative mandates, expenditures are likely to outpace revenue. Under such conditions, school districts can attempt to increase local revenue, reduce other expenses, and/or rely upon their unassigned fund balance to close the budget gap caused by underfunding. To the extent that underfunded mandates create fiscal distress for school districts, unfavorable changes to fund balances may result. This leads to the first primary hypothesis that a negative relationship exists between changes to expenditures for pension mandates and changes to unassigned fund balances, stated in the null as follows:

H1: *Unassigned fund balances for Pennsylvania districts are not associated with expenditures for pension mandates.*

The alternative hypothesis is that unassigned fund balances are negatively associated with pension expenditures.

Similarly, growth of charter schools (particularly cyber charter) increasingly burden district budgets. Required payments to charter schools create significant outlays without commensurate increases in funding, or reduction in expenses, since much of a school district's costs are committed (unavoidable) fixed costs. This leads to the second primary hypothesis that a negative relationship exists between unassigned fund balance and payments for charter school mandates. This is stated in the null as H2:

H2: *Unassigned fund balances for Pennsylvania districts are not associated with expenditures for charter school mandates.*

The alternative hypothesis is that unassigned fund balances are negatively associated with underfunded charter school expenditures.

While unassigned fund balances are expected to be negatively associated with pension and charter school expenditures for the aggregate population, it is also likely that differential effects occur across locales, or geographic classifications (De Luca 2006). For example, more rural and less wealthy school districts may not have the tax base strength to offset underfunded mandates as easily as wealthier, suburban school districts. In addition, residents within city and rural school districts may be more likely to pursue alternative educational options due to perceptions of lower educational attainment relative to small town and suburban school districts. Districts within such locales could experience more adverse effects from underfunded charter school mandates. Therefore, the following additional hypothesis, stated in the null, is examined.

H3: *Unassigned fund balances for Pennsylvania districts are not differentially associated with expenditures for pension or charter school mandates across locales.*

The alternative hypothesis is that unassigned fund balances are differently associated with mandated expenditures across locales.

Finally, underfunded mandates are expected to impose increasing budget burdens on districts across time, particularly exacerbating fiscal distress in the more recent years of the 6-year period in this study. As noted above, the pension contribution rate for school districts is increasing each year from 5 percent in 2010-11 to more than 31 percent for fiscal year 2017-18. This leads to the fourth hypothesis, stated in the null:

H4: *Unassigned fund balances for Pennsylvania districts are not differentially associated with expenditures for pension or charter school mandates across years.*

The alternative hypothesis is that unassigned fund balances are differently associated with mandated expenditures with greater impacts occurring in recent years.

Thus, this study investigates the associations between unassigned fund balances and expenditures arising from underfunded mandates for pension and charter school obligations. In addition, differential effects are investigated across locales and years for subsamples of school districts. Univariate tests and multivariate OLS regression analyses examine the underfunded mandate hypotheses.

Data

Fiscal data are obtained from the Pennsylvania Department of Education (PDE) website http://www.education.pa.gov school finance page. Data obtained from the PDE website include unassigned fund balances, local, state, and federal revenues, salaries, pension expenditures, charter school payments, non-pension benefits, and other expenditures, by school district. In addition, a size measure, average daily membership is obtained from the PDE website. Data items are cross-referenced to the Pennsylvania Local Education Agencies (LEA) Chart of Accounts Object Codes.

Locale Codes for geographic partitioning of districts are obtained from the National Center for Education Statistics (NCES) http://nces.ed.gov. Locale Codes are matched to school district fiscal data by administrative unit number (AUN). These 12 locale codes replace the 8 metro-centric codes previously used for classifying school districts by location. For some classifications, the 12 locale codes result in very small sample sizes. The 12 locale codes are then consolidated into four classifications for the following subsamples: city; suburb; town; and rural.

Table 1 summarizes sample characteristics. Panel A shows that the number of public school districts in Pennsylvania totals 500, of which 499 are used in the analysis. One large suburban school district had outlier data that likely reflects an error in the data set. For this reason, all observations related to this school district are removed from the analysis. The breakdown using NCES Locale Codes indicates that the majority of school districts are located in suburban (211 net of outlier) and rural (172) areas. Large districts dominate the suburban category, while rural classifications tend to be either fringe or distant. City locales provide 16 school districts, while the remaining 100 districts are located in towns.

TABLE 1
SAMPLE CHARACTERISTICS

Panel A: Count by Locale			
	Total Public School Districts in Pennsylvania		N = 500
	Breakdown by NCES Locale Codes		
	City – Large	2	
	City – Mid-Size	2	
	City – Small	12	
	Sub-total – City		16
	Suburb – Large	165	
	Less: Outlier Suburb - Large	(1)	
	Suburb – Mid-Size	22	
	Suburb – Small	25	
	Sub-total – Suburb		211
	Town – Fringe	63	
	Town – Distant	28	
	Town – Remote	9	
	Sub-total – Town		100
	Rural – Fringe	79	
	Rural – Distant	82	
	Rural – Remote	11	
	Sub-total – Rural		172
	Total used in analysis		499

Panel B: Selected Characteristics – 2016-17 Fiscal Year						
	Total Expenditures (000s)		Fund Bal (000s)		Fund Bal % of Expenditures	
Locale	Mean	Median	Mean	Median	Mean	Median
City (N = 16)	430443	153946	11919	8615	2.77	5.60
Suburb (N = 211)	69906	57976	4184	3361	5.99	5.80
Town (N = 100)	36841	30979	3351	2492	9.10	8.04
Rural (N = 172	30082	21065	2855	2113	9.49	10.03
Total (N = 499)	61113	35540	3807	2619	6.23	7.37

Panel B of Table 1 presents total expenditures, unassigned fund balances, and unassigned fund balances as percentages of total expenditures, by major locale, for the most recent 2016-17 fiscal year. Overall, Pennsylvania school districts maintain a mean (median) unassigned fund balance as a percentage of total expenditures equal to 6.23% (7.37%). City school districts maintain the lowest fund balance percentages with a mean (median) of 2.77% (5.60%). At the other end, rural districts maintain the highest fund balance percentages with a mean (median) of 9.49% (10.03%). These initial characteristics suggest that rural districts within Pennsylvania may have a greater cushion against underfunded mandates, relative to districts located within cities.

Model and Variable Specifications

Districts have widely varying student populations along with corresponding revenues and expenditures. Since such differences can bias results through size effects, all variables are deflated by the size measure "average daily membership" or "ADM". The ADM measures the size of a school district, or the number of pupils that attend. Thus, deflating all variables by ADM controls for size effects. The dependent variable, ΔFUNDBAL (change in unassigned fund balance per ADM from one fiscal year to the next), is computed for fiscal years ending 2011-17 and represents the primary measure of fiscal stability.

Change in unassigned fund balance is a key indicator of tight budgetary situations for school districts and are expected to be negatively affected by operating deficits. Under such conditions, drawdowns may cause the unassigned fund balance to decrease as it provides a buffer to sustain operating activities. Thus, the dependent variable and measure of fiscal stability is the annual change in fund balance:

ΔFUNDBAL = change in unassigned fund balance per ADM from one fiscal year to the next

Two independent test variables include: (1) the change in pension expenditures, which relates to mandated employee pension costs; and (2) the change in charter school payments (including cyber charter), which relates mandated charter school costs.

ΔPENSION = change in mandated pension expenditures per ADM from one fiscal year to the next. A negative association with ΔFUNDBAL is expected.

ΔCHARTER = change in mandated charter school expenditures per ADM from one fiscal year to the next. A negative association with ΔFUNDBAL is expected.

Other factors that can affect unassigned fund balance are considered as control variables for the multivariate regressions. These factors include expenditures for non-retirement benefits (e.g., healthcare), and all other expenditures. On the funding side, control variables for local and state revenue are included. Federal revenue is also initially examined, but not used due to it being a relatively small and variable funding source.

Final control variables are specified below.

> ΔOTHBEN = change in non-pension benefits per ADM from one fiscal year to the next. A negative association with ΔFUNDBAL is expected.
>
> ΔOTHEXP = change in all other expenditures per ADM, excluding pension costs, charter school payments, non-retirement benefits, and salaries from one fiscal year to the next. A negative association with ΔFUNDBAL is expected.
> ΔLOCREV = change in local revenue per ADM, a major source of school district funding; school districts exercise some degree of control over this funding source. A positive association with ΔFUNDBAL is expected.
>
> ΔSTREV = change in state revenue per ADM, a non-controllable source of school district funding. A positive association with ΔFUNDBAL is expected.

As indicated in the hypothesis formulations, negative associations are expected between the test variables, ΔPENSION and ΔCHARTER, and the dependent variable ΔFUNDBAL. Negative associations are expected between the control expense variables, ΔOTHBEN and ΔOTHEXP, while positive associations are expected for both funding variables, ΔLOCREV and ΔSTREV. Univariate tests of differences in means (t-tests) and medians (Mann-Whitney U tests) are performed across locales for a 6-year period 2011-17. In addition, the following multivariate OLS regression model is used to test the underfunded mandate hypotheses:

Regression Model

$$\Delta FUNDBAL = \alpha + \Delta PENSION + \Delta CHARTER + \Delta LOCREV + \Delta STREV + \Delta OTHBEN + \Delta OTHEXP + \varepsilon \quad (1)$$

As noted, regression model (1) includes the two test variables for pension and charter school expenditures, along with revenue control variables for major funding factors. In addition, the model controls for non-retirement benefits (e.g., health benefits) and other non-labor-related expenditures that can also affect the unassigned fund balance.

Except for the levels data in Table 2 below, all data are presented as first differences since incremental changes in expenditures arising from underfunded mandates are expected to be associated with incremental changes in unassigned fund balances. First differencing also controls for omitted-variable bias and is equivalent to employing a fixed effects model by which unobservable differences are controlled across groups. Moreover, a first-difference specification mitigates multicollinearity issues, and reduces non-stationarity and simultaneity bias (Dunbar and Phillips 1997).

The multivariate analyses initially pool observations across all locales and across the 6-year period 2011-17. In addition, each year is separately examined across all locales pooled by year. Further regression estimates across all years are pooled for each locale subsample. Through these analyses and tests, the associations of expenditures arising from underfunded mandates with unassigned fund balance and fiscal stability are scrutinized.

RESULTS

Descriptive Statistics and Univariate Tests

Panel A of Table 2 presents levels of fund balances and revenues per ADM for the most recent fiscal year 2016-17. The mean (median) fund balance per student for all school districts was \$1,489 (\$1,244). In addition, local revenue sources, with a mean (median) of \$9,079 (\$8,456) per ADM far exceed the aggregate of state and federal sources per ADM. City and rural districts tend to be more dependent on state funding than those located within suburbs and towns, which is likely due to lower wealth levels typically present within these locales.

In Panel B, total expenditure levels per ADM for all school districts in 2016-17 were a mean (median) of $17,398 ($16,757). Salaries constitute approximately 40 percent of total expenditures, while total benefits represent roughly 25 percent. In the aggregate, labor and related benefit costs contribute almost two-thirds of total public school district expenditures. Of the total benefits, pension expenditures represent a mean (median) of $2,042 (1,972), or roughly 47 percent of total benefit costs, with non-retirement benefits, such as healthcare, representing the remainder.

Mean (median) charter school payments appear to be greater for cities relative to other categories as cities expended a mean (median) of $1,243 ($945) per ADM versus $488 ($335) across all districts. While rural districts have the lowest charter school payments per ADM, their payments for cyber charter students are relatively high with a mean (median) of $340 ($304), not far behind cyber payments made by city locales. Other expenditures across all school districts are comparable, ranging from a low mean (median) of $5390 ($4560) for towns to a high mean (median) of $5754 ($5265) for suburbs.

TABLE 2
DESCRIPTIVE LEVELS BY LOCALE – MOST RECENT FISCAL YEAR 2016-17

Panel A: Levels of Fund Balance and Revenues Per Average Daily Membership (ADM)–2016-17 Fiscal Year

	Fund Balance		Local Revenue		State Revenue		Federal Revenue	
Locale	Mean	Median	Mean	Median	Mean	Median	Mean	Median
City (N = 16)	980	1157	6759	6361	8438	8831	979	1157
Suburb (N = 211)	1121	1122	11049	10888	6030	5343	338	221
Town (N = 100)	1654	1313	7490	6910	8145	7993	413	361
Rural (N = 172	1890	1484	7803	6936	8940	9266	421	346
Total (N = 499)	1489	1244	9079	8456	7534	7132	402	311

Panel B: Levels of Expenditures Per Average Daily Membership (ADM) – 2016-17 Fiscal Year

	Total Expenditures		Salaries		Benefits		Pension	
Locale	Mean	Median	Mean	Median	Mean	Median	Mean	Median
City (N = 16)	16745	16102	6133	6190	3949	3968	1826	1830
Suburb (N = 211)	17910	17369	7255	6930	4365	4177	2139	2030
Town (N = 100)	16510	15616	6532	6498	4172	4074	1913	1912
Rural (N = 172	17348	16745	6881	6713	4406	4282	2018	1982
Total (N = 499)	17398	16757	6945	6704	4327	4197	2042	1972

Panel B: (continued)

	Non-Retirement Benefits		Charter		Cyber-Charter Only		Other Expenditures	
Locale	Mean	Median	Mean	Median	Mean	Median	Mean	Median
City (N = 16)	2124	2188	1283	945	368	330	5379	5106
Suburb (N = 211)	2226	2160	537	321	240	210	5754	5265
Town (N = 100)	2259	2158	417	345	298	281	5390	4560
Rural (N = 172	2389	2339	395	333	340	304	5666	5245
Total (N = 499)	2285	2213	488	335	290	266	5639	5163

Table 3 presents spearman correlation coefficients for first differences pooled across the 6-year period 2011-17. Statistically significant coefficients are observed at a p-value < 0.01 between ΔFUNDBAL and all independent variables. As expected, all expenditure variables have negative associations with ΔFUNDBAL, while all revenue variables have positive associations with ΔFUNDBAL.

TABLE 3
SPEARMAN CORRELATION COEFFICIENTS FOR FIRST DIFFERENCES
POOLED FOR 6-YEAR PERIOD 2011-17
N = 2994

	ΔFUNDBAL	ΔSALARY	ΔPENSION	ΔOTHBEN	ΔCHARTER	ΔOTHEXP	ΔLOCREV	ΔSTREV
ΔFUNDBAL	1.000							
ΔSALARY	-0.067**	1.000						
ΔPENSION	-0.024	0.610**	1.000					
ΔOTHBEN	-0.082**	0.328**	0.255**	1.000		.		
ΔCHARTER	-0.094**	-0.081**	-0.088**	-0.043*	1.000			
ΔOTHEXP	-0.074**	0.086**	0.114**.	0.008	-0.063**	1.000		
ΔLOCREV	0.200**	0.256**	0.225**	0.141**	-0.029	0.145**	1.000	
ΔSTREV	0.096**	0.322**	0.215**	0.178**	-0.011	0.093**	0.110**	1.000

*, ** Indicate that the correlation is significant at the 0.05 and 0.01 levels, respectively. Two-tailed tests.

Variable Definitions
ΔFUNDBAL = change in unassigned fund balance from one fiscal year to the next
ΔSALARY = change in employee salary expenditures from one fiscal year to the next
ΔPENSION = change in retirement expenditures from one fiscal year to the next
ΔOTHBEN = change in nonretirement benefits from one fiscal year to the next
ΔCHARTER = change in charter school expenditures from one fiscal year to the next
ΔOTHEXP = change in all other expenditures, excluding charter school payments
ΔLOCREV = change in local revenue, a major source of school district funding school districts exercise some degree of control over this funding source
ΔSTREV = change in state revenue, a non-controllable source of school district funding

Note that ΔSALARY has a very strong bivariate correlation with ΔPENSION (0.607), which suggests the risk of multicollinearity could arise with using this variable in the multivariate regression analysis. In addition, bivariate correlations greater than 0.30 occur between ΔSALARY and ΔOTHBEN as well as ΔSTREV. For these reasons, ΔSALARY is excluded from the multivariate analyses.

Table 4 shows descriptive and univariate statistics, including tests of differences in means and medians for variables used in the regression analyses. First differences, deflated by ADM, are pooled for the 6-year period 2011-17. This provides 2,994 first difference observations for 499 districts across the 6-year period. Panel A presents means, medians, and standard deviations by locale, while Panel B shows pairwise tests of differences in means and medians. First, mean annual decreases in unassigned fund balances per ADM (ΔFUNDBAL) for city school districts occur across the 6-year period. While towns maintain small annual increases in ΔFUNDBAL, on the average, rural and suburb locales generate increases during this period.

TABLE 4
DESCRIPTIVE STATISTICS AND TESTS OF DIFFERENCES IN MEANS AND MEDIANS FOR VARIABLES USED IN REGRESSION ANALYSIS FIRST DIFFERENCES PER ADM POOLED FOR 6-YEAR PERIOD 2011-17

Panel A: Descriptive Statistics					
Variable	All Districts	City Subsample	Suburb Subsample	Town Subsample	Rural Sub sample
N =	2994	96	1266	600	1032
ΔFUNDBAL					
Mean	29.546	-36.581	28.386	8.105	49.586
Median	29.210	2.974	20.862	18.871	49.270
Std. Dev.	718.595	638.309	694.024	735.765	744.930
ΔPENSION					
Mean	279.436	243.256	291.589	260.706	278.784
Median	273.280	240.250	284.001	259.173	273.902
Std. Dev.	97.474	117.577	103.904	86.625	90.524
ΔOTHBEN					
Mean	38.636	23.870	26.002	45.088	51.758
Median	43.681	29.309	34.538	49.258	57.650
Std. Dev.	164.987	180.381	157.328	150.175	179.272
ΔCHARTER					
Mean	32.559	104.815	35,951	28.595	23.768
Median	19.954	69.950	17.856	22.885	18.837
Std. Dev.	123.417	198.820	147.856	100.015	85.764
ΔOTHEXP					
Mean	129.001	170.861	159.216	107.996	100.253
Median	84.856	60.423	85.424	87.271	84.738
Std. Dev.	2584.766	2287.478	2237.599	3188.784	2619.084
ΔLOCREV					
Mean	265.106	190.694	292.189	218.692	265.791
Median	242.958	177.188	283.622	196.235	231.468
Std. Dev.	324.821	301.448	339.034	317.833	309.073
ΔSTREV					
Mean	357.861	368.637	290.016	384.399	424.659
Median	293.795	343.259	247.063	330.792	353.922
Std. Dev.	365.769	346.873	347.162	345.300	386.794

TABLE 4 (CONTINUED)						
Panel B: Tests of Differences in Means and Medians (p-values)						
Variable	City vs. Suburb	City vs. Town	City vs. Rural	Suburb vs. Town	Suburb vs. Rural	Town vs. Rural
ΔFUNDBAL						
Mean	0.341	0.534	0.215	0.571	0.484	0.275
Median	0.363	0.677	0.149	0.455	0.025*	0.028*
ΔPENSION						
Mean	0.000**	0.166	0.005**	0.000**	0.002**	0.000**
Median	0.000**	0.063	0.000**	0.000**	0.003**	0.000**
ΔOTHBEN						
Mean	0.911	0.276	0.150	0.012*	0.000**	0.421
Median	0.453	0.099	0.026*	0.027*	0.000**	0.190
ΔCHARTER						
Mean	0.001**	0.000**	0.000**	0.230	0.014*	0.288
Median	0.000**	0.000**	0.000**	0.213	0.423	0.093
ΔOTHEXP						
Mean	0.962	0.814	0.776	0.723	0.567	0.421
Median	0.750	0.925	0.926	0.718	0.684	0.963
ΔLOCREV						
Mean	0.002**	0.403	0.022*	0.000**	0.051	0.004**
Median	0.001**	0.536	0.055	0.000**	0.001**	0.009**
ΔSTREV						
Mean	0.034*	0.680	0.137	0.000**	0.000**	0.030*
Median	0.001**	0.956	0.359	0.000**	0.000**	0.065

*, ** Indicate significant differences at the 0.05 and 0.01 levels, respectively. P-values for two-tailed t-tests of differences of means; p-values for two-tailed Mann-Whitney U tests of medians.

Variable Definitions

ΔFUNDBAL = change in unassigned fund balance from one fiscal year to the next
ΔPENSION = change in retirement expenditures from one fiscal year to the next
ΔOTHBEN = change in nonretirement benefits from one fiscal year to the next
ΔCHARTER = change in charter school expenditures from one fiscal year to the next
ΔOTHEXP = change in all other expenditures, excluding charter school payments
ΔLOCREV = change in local revenue, a major source of school district funding school districts exercise some degree of control over this funding source
ΔSTREV = change in state revenue, a non-controllable source of school district funding

Pension costs (ΔPENSION) increase across all subsamples, whereas suburb and rural locales appear to have relatively larger annual increases relative to other locales. Non-retirement benefits (ΔOTHBEN) show substantially smaller increases across all locales relative to pension expenditures. Note that districts are potentially better positioned to control non-retirement benefit costs relative to state-mandated retirement contributions. In addition, changes to charter costs (ΔCHARTER) are larger for cities relative to other locales across the 6-year period, while other expenditures (ΔOTHEXP) are somewhat higher (lower) for cities (rural) locales. Finally, local revenues (ΔLOCREV) are lower (higher) for cities (suburbs), while state revenues (ΔSTREV) are lower for suburbs and higher for the other locales.

Panel B of Table 4 shows two-tailed tests of differences in mean and median changes. For ΔFUNDBAL, Mann-Whitney U tests of medians indicate statistically significant differences between rural versus suburban as well as rural versus town locales, which indicate differentials from which to cope with underfunded mandates. Differences in means (t-tests) and medians for ΔPENSION are statistically significant for all pairwise comparisons except city versus town. These initial findings suggest that city school districts experience lower increases in pension costs, relative to suburb and rural locales.

Although non-retirement benefits (ΔOTHBEN) show lesser differences in annual changes across locales, Panel B identifies statistically significant differences in both means and medians for suburb versus town and suburb versus rural comparisons. Thus, ΔOTHBEN appears to have increased more within suburbs, relative to town and rural locales during the 6-year period. Charter school expenditures per ADM (ΔCHARTER) show that increases are greatest for the city subsample with statistically significant differences in ΔCHARTER across both means and medians for city versus suburb, city versus town, and city versus rural. These univariate tests suggest that city districts experience differential charter expenditures per ADM relative to districts in other locales. While ΔOTHEXP appears to increase across all subsamples, none of the differences across locales is statistically significant.

On the revenue side, suburbs, which tend to be wealthier and have a more stable tax base, realized annual changes to local revenue that exceeded other locales. Most notable are the significant differences between medians for suburban districts versus all other locales. In addition, rural districts attain greater mean and median increases in ΔLOCREV versus the town locale. Pairwise tests also find significant mean and median differences in ΔLOCREV for rural versus city. This indicates that rural districts have been better able to implement additional local tax funding relative to city and town locales.

Finally, at the state level, cities, towns and rural school districts benefited more than suburbs from some restoration of state education funding after substantial cuts. Indeed, these differences result in a significant median difference in ΔSTREV for cities versus suburbs and a significant mean difference for rural versus towns. Moreover, statistically significant mean and median differences are observed for suburb versus town and suburb versus rural. These results suggest that wealthier suburban locales have not derived the same degree of state funding restoration as districts in other locales across the state.

Multivariate Regression Analysis

Table 5 presents OLS regression results for all districts across the 6-year period 2011-17 with 2,994 total observations. Variance inflation factors range from 1.005 to 1.220, which suggests no multicollinearity issues. In addition, Durbin-Watson statistics fall between 1.835 and 2.094, which indicates neither positive nor negative autocorrelation exists across all regressions. Results for all districts attain an adjusted R^2 equal to 4.0 percent. As expected, the two test variables (ΔPENSION and ΔCHARTER) have negative estimated coefficients and are statistically significant at the $p < 0.01$ level, using one-tailed tests. Estimated coefficients for both revenue control variables (i.e., ΔLOCREV, and ΔSTREV) are also significant in the expected directions. One of the additional expenditure control variables, ΔOTHBEN, is also negatively associated with ΔFUNDBAL.

Overall results suggest that ΔCHARTER and ΔPENSION have negative and statistically significant effects on ΔFUNDBAL across the 2011-17 period for all districts. Thus, H1 is rejected since pension expenditures have an incremental negative association with unassigned fund balances, controlling for major funding sources and other expenditures that can influence fund balances. In addition, H2 is rejected as charter school expenditures also have a negative association with unassigned fund balances, controlling for major funding sources and other expenditures.

A further examination of all districts, partitioned by year, provides insight regarding the differential associations of ΔCHARTER and ΔPENSION with ΔFUNDBAL and stability of these relationships across years. Explanatory power ranges from an adjusted R^2 of 3.0 percent in 2014-15 to 7.7 percent in 2015-16. Consistent with expectations, ΔCHARTER is negatively associated with ΔFUNDBAL in four of the six years. In addition, ΔPENSION is statistically significant in three of the years, with significance in two of the three most recent years. These results identify differential associations of fund balances with both pension and charter expenditures across years, which rejects H4.

Panel B of Table 5 shows regression results by locale, pooled across the 6-year period. The city subsample contributes 96 observations; towns provide 600 observations; the rural subsample consists of 1,032 observations; and the suburb locale provides 1,266 observations. Each observation is a first difference pooled across the 6-year period, as noted above. Two-tailed tests of significance are used for the intercept, while one tailed tests for the test and other explanatory variables.

TABLE 5
OLS REGRESSION RESULTS

Panel A: OLS Regression Model with Control Variables– All Locales								
Variable	Expected Sign	All Locales & Years Combined	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Intercept	?	-4.397	-37.673	38.969	-16.415	163.247	185.136	-16.265
t-stat		0.108	0.400	0.318	0.138	1.222	1.462	0.134
(p-value)		(0.914)	(0.690)	(0.751)	(0.446)	(0.222)	(0.144)	(0.894)
ΔPENSION	(-)	-0.344**	-0.125	-0.857*	-0.259	-0.811*	-1.125**	-0.001
t-stat		2.447	0.261	1.675	0.643	1.846	2.916	0.002
(p-value)		(0.007)	(0.397)	(0.048)	(0.261)	(0.028)	(0.002)	(0.499)
ΔCHARTER	(-)	-0.434**	-0.486*	-0.057	-0.358*	-0.890**	-0.216	-0.679*
t-stat		4.154	2.155	0.245	1.759	2.948	0.724	2.173
(p-value)		(0.000)	(0.016)	(0.402)	(0.040)	(0.002)	(0.235)	(0.015)
ΔLOCREV	(+)	0.361**	0.253**	0.468**	0.345**	0.339**	0.755**	0.152
t-stat		8.755	3.036	4.418	3.749	2.960	6.514	1.496
(p-value)		(0.000)	(0.002)	(0.000)	(0.000)	(0.002)	(0.000)	(0.068)
ΔSTREV	(+)	0.170**	0.151*	0.177	0.094	0.108	0.163	0.215**
t-stat		4.755	2.085	1.319	1.110	0.971	1.459	2.855
(p-value)		(0.000)	(0.019)	(0.094)	(0.134)	(0.166)	(0.073)	(0.002)
ΔOTHBEN	(-)	-0.329**	-0.165	-0.602**	-0.395*	-0.304	-0.097	-0.437*
t-stat		4.076	0.995	2.954	2.179	1.379	0.466	2.106
(p-value)		(0.000)	(0.160)	(0.002)	(0.015)	(0.085)	(0.321)	(0.018)
ΔOTHEXP	(-)	0.001	-0.014	0.008	-0.034**	0.005	0.002	0.022*
t-stat		0.240	1.226	0.614	2.457	0.395	0.179	1.850
(p-value)		(0.405)	(0.111)	(0.270)	(0.007)	(0.347)	(0.429)	(0.033)
N =		2994	499	499	499	499	499	499
Adjusted R^2		0.040	0.032	0.046	0.040	0.030	0.077	0.032

*,**Significant at the 0.05 and 0.01 levels, respectively. One-tailed tests for all test and control variables. Two-tailed tests for intercepts.

Regression Model: $\Delta FUNDBAL = \alpha + \Delta PENSION + \Delta CHARTER + \Delta LOCREV + \Delta STREV + \Delta OTHBEN + \Delta OTHEXP + \mathcal{E}$

TABLE 5 (CONTINUED)					
Panel B: OLS Regression Model With Control Variables– By Locale					
Variable	Expected Sign	Cities	Towns	Rural	Suburbs
Intercept	?	-88.891	-55.908	15.412	3.068
t-stat		0.567	0.575	0.199	0.053
(p-value)		(0.572)	(0.565)	(0.843)	(0.958)
ΔPENSION	(-)	-0.472	-0.110	-0.409	-0.347*
t-stat		0.831	0.305	1.506	1.775
(p-value)		(0.204)	(0.381)	(0.066)	(0.038)
ΔCHARTER	(-)	-0.497	-0.836**	-0.517*	-0.295*
t-stat		1.526	2.849	1.939	2.269
(p-value)		(0.066)	(0.003)	(0.027)	(0.012)
ΔLOCREV	(+)	0.322	0.379**	0.314**	0.385**
t-stat		1.487	3.973	4.122	6.518
(p-value)		(0.071)	(0.000)	(0.000)	(0.000)
ΔSTREV	(+)	0.417*	0.161*	0.240**	0.100*
t-stat		31.968	1.878	3.970	1.769
(p-value)		(0.026)	(0.031)	(0.000)	(0.039)
ΔOTHBEN	(-)	-0.195	-0.660**	-0.479**	-0.069
t-stat		0.551	3.274	3.555	0.551
(p-value)		(0.292)	(0.001)	(0.000)	(0.291)
ΔOTHEXP	(-)	0.052*	0.017*	-0.001	-0.015*
t-stat		1.677	1.894	0.135	1.773
(p-value)		(0.047)	(0.030)	(0.447)	(0.039)
N =		96	600	1032	1266
Adjusted R^2		0.123	0.053	0.038	0.037

*,**Significant at the 0.05 and 0.01 levels, respectively. One-tailed tests for all test and control variables. Two-tailed tests for intercepts.

Regression Model: $\Delta FUNDBAL = \alpha + \Delta PENSION + \Delta CHARTER + \Delta LOCREV + \Delta STREV + \Delta OTHBEN + \Delta OTHEXP + \mathcal{E}$

For the city subsample (n=96), results show an adjusted R^2 equal to 12.3 percent. While neither of the test variables are significantly associated with ΔFUNDBAL, ΔSTREV is statistically significant for city districts. Results for the town subsample (n=600) show an adjusted R^2 of 5.3 percent, where ΔCHARTER and ΔLOCREV have statistically significant coefficients. These results for the town subsample suggest that ΔCHARTER has a negative and statistically significant effect on ΔFUNDBAL.

The rural subsample (n=1032) shows an adjusted R^2 of 3.8 percent. The estimated coefficient for ΔCHARTER is negative and significant at the $p < 0.05$ level, while ΔOTHBEN also has a negative estimated coefficient and is significant at the $p < 0.01$ level. Two other control variables, ΔLOCREV and ΔSTREV are also significant at the $p < 0.01$ level. Results for the rural subsample are consistent with the town subsample and affirm that ΔCHARTER has a negative and statistically significant effect on ΔFUNDBAL for rural districts.

Finally, results for the suburb subsample (n=1266) show an adjusted R^2 of 3.7 percent. Comparable to the overall sample, the two test variables, ΔPENSION and ΔCHARTER, have negative estimated coefficients and are significant at the $p < 0.01$ level. Likewise, estimated coefficients for all control variables are significant in the expected directions (i.e., ΔLOCREV, ΔSTREV, ΔOTHBEN, and ΔOTHEXP). This indicates that underfunded mandates have incrementally negative associations with unassigned fund balances, controlling for other expenses and funding sources. Differential associations of fund balances with both pension and charter expenditures across locales also rejects H3.

In sum, results support alternative hypothesis 1 and suggest that pension legislation adversely affects the fiscal stability of all districts, controlling for the other major factors that can affect fiscal stability. Negative effects for pension expenditures are identified across fiscal years 2014-15 and 2015-16, which suggests fiscal instability effects are associated with the pension mandate, becomes more intense in later years. This supports alternative hypotheses 4, which relates to differential mandate effects across years. This research also finds support for alternative hypothesis 2, which suggests that unassigned fund balances are negatively associated with charter school legislation. All locales, except for cities, show statistically significant associations between charter expenditures and fund balances. These differential effects across locales affirm alternative hypothesis 3.

DISCUSSION AND CONCLUSION

No prior studies examine fund balances for public school districts within the context of underfunded legislative mandates. This research finds that expenditures arising from pension and charter school legislation, combined with tepid funding at the state level, is negatively associated with unassigned fund balances and fiscal stability for districts across the state. Results from this study have implications for taxpayers, public employees, legislators, and educational institutions.

Fund balances and local tax revenues are essential to maintain fiscal stability while coping with underfunded legislative mandates. Fiscal stability of school districts can affect the quality and availability of services, both of which have ripple effects to higher education. In addition, bond ratings depend on fiscal strength and adverse rating actions can increase the cost the borrowing and limit future investment in the physical infrastructure.

Underfunded mandates ultimately shift revenue sources from the state to local levels and cause school districts to rely upon unassigned fund balances, and to some extent reducing non-mandated expenditures, to close the funding gap. Although local tax increases are bounded by Pennsylvania statute, this tends to be the most important, controllable, and stable funding source, relative to state or federal funding. Thus, local revenues compensate for state funding shortfalls and shift tax burdens for residents.

Similar to findings by Trussel and Patrick (2013), high proportions of intergovernmental revenue signal prospective reductions in public services and may lead to deteriorating educational quality and levels of school services. Moreover, consistent with Chaney, et al. (2002), public policy concerns arise whenever public pension plans remain underfunded to facilitate the balancing of state budgets. Although public unions are increasingly under political attack, to some extent, they can provide a counter-balance to protect pension funding.

Differential strength in local tax bases leads to inequities in funding levels, notwithstanding state efforts to equalize such inequities. Within the current political landscape, some traction is developing for eliminating local funding with a shift toward greater levels of state revenues. Such actions could further jeopardize education funding and create greater political risks. Residents and voters should hold legislators accountable for underfunded mandates and ensure careful consideration of legislative changes that affect local tax revenues.

Finally, this research has risk management and performance management implications for entities subject to legislative risk from underfunded mandates as well as other legislative actions. A risk management approach can provide guidance to manage external risks. When legislative risks are explicitly recognized executive leadership can become proactive in planning, lobbying, and mitigating such threats. As noted by Gorden and Fischer (2018), performance management systems can also help to manage costs while maintaining efficiency and effectiveness of educational services.

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