

Will More Kids in Town Raise the Local Tax Rate?

**A Report to the
New Hampshire Association of Realtors**

By

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Introduction

This report explores one possible reason that New Hampshire's towns and cities might be reluctant to fast track construction projects that make new housing more readily available. As the title of this report suggests, some citizens and officials in a town or city might harbor the fear that the construction of new housing units will bring additional school-age children to their community and that schooling costs and the property tax rate will both increase as a consequence. But this fear raises a very serious question: Would more kids in town inevitably raise the local tax rate? As we shall see, the answer to that question is absolutely not.

This fear that housing additional families would require a higher property tax rate to pay for public schools has been expressed by a number of local officials and community members. Redevelopment of the former DES site in downtown Concord, for example, has been designed to attract "singles, childless young couples and empty-nesters." According a Concord city official, "the project will have negligible impacts on student enrollment for the Concord School District" (*Concord Monitor*, June 20, 2019).

The creation of barriers to housing construction because of a reluctance to educate more children is a serious issue because housing affordability is a continuing problem in New Hampshire. According to the 2018 *Housing Market Report* published by the NH Housing Finance Authority, 46 percent of rental households are spending 30 percent or more of their household income on rent (p. 6). Between 2010 and 2018, listings for homes less than \$300,000 dropped over 59 percent while listings of homes above \$300,000 decreased by less than 13 percent. Homes under \$300,000 are

typically in the price range desired by those looking for their first home (p. 9). The average time that a listed home stays on the market remains quite low compared to previous years, evidence of limited options for homebuyers (p. 9). Although the number of building permits for new homes has increased modestly during recent years, the number of permits issued by New Hampshire's towns and cities remains far below the years before the Great Recession (p. 10).

This tightness in the housing market might be good news for existing owners of homes and apartment complexes, but it is not good for the New Hampshire economy. According to the president of the Greater Concord Chamber of Commerce, Mr. Tim Sink, many young people are leaving New Hampshire despite the state's very low unemployment rate because of the scarcity of affordable housing for recent college graduates and young families. According to Mr. Sink, affordable housing for young professionals is the most pressing need if New Hampshire wants to recruit and retain those workers who will help the state's economy to expand and prosper (*NH Union Leader*, 21 July 2019).

No doubt there are multiple reasons for the escalation of apartment rents and house prices in New Hampshire and the sluggish rate of apartment and housing construction in response to those profit signals. However, reluctance of towns and cities to rezone land for residential use, especially multi-family buildings, could be one reason. Another reason might be a slow and complicated planning and permitting process within a town or city that raises the cost of constructing new housing in that locality. Edward Glaeser and Joseph Gyourko, two economists at the respected National Bureau for Economic Research, provided evidence in a 2002 paper that zoning

and other local regulations on land use can indeed have a serious impact on housing affordability.

In the next section of this report, I will use some simple accounting and the economist's distinction between average and marginal cost to explore the impact of more school-age children on a school district's budget. I use recent budget data from the Concord School District to illustrate several lessons that we can derive from accounting and economic principles. In the section that follows, I analyze average class size data to explore the options available to school districts if new students enroll in those districts. In the final section of this report, I use NH Department of Education data on changes in student enrollment (ADM in residence) and the property tax rate for local public education to see whether or not the presence of more children in a community has raised the tax rate actually paid by its property owners. This analysis covers all 234 towns and cities in the state during the decade from the 2007-08 school year through the 2017-18 school year.

School Enrollment and Budget Analysis

Consider the following (faulty) line of reasoning. Suppose that a new house or apartment unit entered the assessment rolls in Concord in 2017 with an assessed value of \$250,000. Since the local education tax rate in Concord that year was \$13.24 per thousand dollars of assessed value, this newly constructed housing unit would yield \$3,310 of annual property tax revenue to help fund the Concord School District.

What if a school-age child lived in this domicile? The *average* cost of educating an elementary student in Concord was \$17,570 during the 2017-18 school year and the

average cost of schooling a high school student was \$14,179.* At first glance, it would appear that the housing unit wouldn't generate enough additional revenue to pay for the child's schooling and that the tax rate imposed on all property owners would have to rise to cover the child's "funding deficit." If one accepted this reasoning without further thought, it might be tempting to wish that the child's home had never been built in the first place and that his or her family had not come to live in Concord.

This reasoning is utterly false and misleading, however, for two major reasons. One reason is that this example implicitly assumes that local property owners are the only source of funding with which to pay for public schools and that the property tax is the only revenue source with which to pay for an additional child's schooling costs. The other reason for rejecting the logic of our example is that it fails to distinguish between the average cost of schooling all the children living in Concord and the marginal, or incremental, cost of educating an additional child. As we shall see, the marginal cost of an extra child is substantially less than the average cost of educating the district's student population.

Concord School District Revenues, 2017-2018 (millions of dollars)	
Local sources (tuition, transportation fees, food services, etc.) +	4.63 +
State aid (building, vocational education, special education, etc.) +	2.68 +
Federal aid (program grants, child nutrition, Medicaid, etc.) +	7.91 +
Other revenues and credits +	2.63 +
State adequacy grants +	19.93 +
Local property taxes =	46.64 =
Total operating budget	84.42

Source: NH Department of Revenue Administration, *MS-26 School Budget Form, 2018*.

* NH Department of Education, *COST PER PUPIL BY DISTRICT, 2017-20*.

Consider first the sources of revenue that help to pay for the public education of Concord's school age children. As the actual budget data for 2017-18 (previous page) demonstrate, local property taxation accounted for more than \$46 million of the district's operating budget, but funding for almost \$40 million of the district's expenditures came from other sources.

When a new pupil enrolls in the Concord School District, one might expect several of these revenue amounts to increase. Transportation fees and food service sales might increase by a modest amount, for example, to help pay for those services. Much more importantly, grants from the state and federal governments might increase because of a student's enrollment. The amount of this increase is hard to predict without detailed information about the child and the school district, however, because state and federal education grants often target concentrations of low-income, special needs and non-English speaking students.

What we can say with certainty is that New Hampshire's adequacy grant program guarantees a *substantial* financial boost to a school district for *every* new student who lives and enrolls in the district. In FY2020, the base adequacy grant from the state to local towns and cities will be \$3709 for every pupil living in a locality. This means that the state adequacy grant program might provide more financial support for a new student's schooling than the local property tax levied on the house or apartment in which the pupil lives.

Even more important than these revenue considerations is the fact that the *marginal* cost of educating an additional student is far less than the *average* cost of schooling all of the students enrolled in a district. Look, for example, at the cost side of the 2017-18 operating

budget for the Concord School District (next page). What is striking is that several of these cost categories would increase little, if at all, if a school district experienced an increase in enrollment.

Concord School District Costs, 2017-2018 (millions of dollars)	
Instruction	44.02
Student support services	5.53
Instruction staff services	3.67
Administration	5.25
Plant operations & maintenance	6.65
Student transportation	3.32
Debt service	5.04
Other	10.94
Total operating budget	84.42

Source: NH Department of Revenue Administration, *MS-26 School Budget Form, 2018*.

Debt service (principal and interest) on existing bonds that were issued to build the district's buildings is a fixed cost that does not vary with current enrollment. If there are empty seats on the fleet of school buses used to transport students, then an enrollment increase would have a minimal impact on student transportation costs.

Although additional students might result in additional cleaning and repair costs, the costs of plant operations (heating, lighting, etc.) depend primarily on building size and design, not on the number of students who enter the front door every morning. The staff needed to administer a school district does not rise proportionately with student enrollment and thus administrative cost per student should actually decline as more students enroll in the district.*

* This point also implies that many small New Hampshire school districts have a high average cost per pupil because administrative overhead costs cannot be spread over a larger number of students.

All of these points suggest that the construction of new homes and apartments in a town will have a modest impact on local education costs unless the enrollment increase is so large that it necessitates construction of new schools, expanding the fleet of yellow school buses, growth of the district's administrative staff, etc.

But what about the direct costs of educating a school district's pupils? Most of the employees of a district are classroom teachers and aides, reading specialists, school psychologists and other professionals who instruct and support students. Turning once again to the table displaying Concord's operating costs, one sees that expenditures on instruction and student support services totaled nearly \$50 million in 2017-18. Wouldn't the school district incur additional instructional and support service expenses if it enrolled additional students? The answer is not necessarily.

This point is easiest to see if we focus our attention on the elementary grades where pupils spend all or most of their school day in self-contained classrooms with a specific classroom teacher.* At the elementary level of instruction, it is necessarily true that:

$$[1] \text{ Total instruction cost} = \frac{(\text{average teacher compensation}) * \text{elementary enrollment}}{\text{average class size}}$$

$$[2] \text{ Average instructional cost} = (\text{average teacher compensation})/(\text{average class size}),$$

where average teacher compensation includes salary, benefits and district retirement contributions and elementary enrollment is measured by ADM in attendance.

* The exceptions, of course, are those special needs students who meet with specialists outside their classrooms during part of the school day. If a school district has a large contingent of special needs students, then student support costs will be substantial and in addition to regular instructional costs.

What will happen to total instruction cost if enrollment increases because of new housing construction? That depends entirely upon what happens to average class size. *If* class size remains exactly the same and *if* newly hired teachers receive the average compensation of the existing staff, then the extra instructional cost for one additional student will be the same as the average cost for all students. *If*, however, average class size goes up as enrollment rises or if new teachers receive compensation below the average for the entire teaching staff, the marginal instruction cost for an additional student will be less than the average instructional expense for all students. *If* average class size rises by the same percentage as enrollment, then total instructional cost remains the same and the additional expense required to instruct one more student will be zero. It is clear, then, that the fiscal impact of enrolling additional students depends crucially on what happens to average class size as total enrollment expands and what salary new teachers receive if they are hired to instruct a growing number of pupils.

Consider first the question of class size. If enrollment grows, shouldn't average class size remain the same in order to preserve the quality of classroom instruction? Won't the education that pupils receive suffer if average class size is allowed to increase? Those questions have been hotly debated by taxpayers, legislators, school administrators, parents and teachers for years and providing definitive answers is beyond the scope of this report. Let me, however, contribute the following observations to this debate:

- NH Department of Education Rule 306.17 mandates that class sizes in the first two grades not exceed 25 pupils and that class sizes in higher elementary grades not exceed 30 pupils.

- Average class sizes in the Concord School District are well within these state-mandated ceilings and have declined during the last decade. (See table below.) It seems reasonable to ask whether or not average class size in Concord might increase to accommodate more pupils in the district’s elementary schools, thereby limiting any increase in instructional cost.
- Average class sizes in Concord’s elementary grades were well above the statewide average in both 2007-08 and in 2017-18. It seems reasonable that some parents and teachers might object to accommodating more students without hiring additional classroom teachers and other instructional professionals. Holding class sizes constant at the 2017-18 levels would, however, result in a substantial increase in instructional cost if enrollment were to increase.

Average Class Size in Elementary Grades			
	Grades 1&2	Grades 3&4	Grades 5-8
Concord, 2007-08	21.0	21.0	22.1
NH state average, 2007-08	17.5	19.1	20.1
Concord, 2017-18	19.4	20.5	20.8
NH state average, 2017-18	16.2	17.7	16.2

Source: NH Department of Education, *Average Class Size by District in Public Elementary Schools*.

- It is difficult to argue that New Hampshire students don’t receive adequate instruction due to excessively large class sizes since Granite State public school students ranked third among the 50 states on 4th grade and 8th grade NAEP reading tests in 2017.

- Students in Massachusetts typically rank first in the nation on NAEP reading and math achievement tests. Half of all Bay State pupils in grades 1-4 during 2016-17 were assigned to classes with twenty or more children. In that same school year, ninety-five percent of Massachusetts students in grades 2-4 were assigned to classes with more than 17 students.* It is not obvious, then, that Granite State pupils find themselves in excessively large classes compared to students in Massachusetts, the leader in elementary school achievement.

But what if a school district does respond to growing enrollment by hiring additional teachers in order to limit or prevent an increase in average class size? Will those new teachers receive the average salary of the teachers already employed by the district? Almost certainly not. School administrators typically hire younger and less experienced teachers compared to the teachers already employed by the district. In 2017-18, the statewide average teacher salary was \$58,278 but the statewide average *minimum* salary (with a B.A. degree) was \$37,451.[°] In that same school year, the average teacher salary in Concord was \$73,531 whereas the minimum starting salary in Concord was \$41,580. Accommodating more students by hiring more teachers is therefore less costly than one might suppose by looking at average teacher salary data.

Summarizing this section of this report, we have found compelling budgetary evidence that the tax rate paid by a school district's property owners need not increase if that

* MA Department of Elementary and Secondary Education, *ESE Policy Brief*, December 2017.

[°] NH Department of Education, *Teacher Average Salary in Public School Districts and Teacher Minimum Starting Salary*.

district's pupil enrollment increases because of new construction. One reason is that the district's revenues will rise even if the property tax rate remains the same, increases in total assessed valuation and state adequacy grants being two major reasons. The other reason is that several items on the cost side of the school district's budget will not increase proportionately, if at all, as enrollment goes up. This is especially true if a school district has the option to raise its average class sizes to the levels of a decade ago.

Analysis of Average Class Size Data

In this section, let's take a closer look at average class size data across the Granite State to see how easily school districts could teach additional students without hiring a lot of new teachers. What the next chart shows is that there is tremendous diversity in average class sizes (grades 1&2) among New Hampshire's school districts. In some communities, there are fewer than ten students per classroom in the entering grades. In other communities, there are twenty or more first and second graders per class. Most districts, however, have between ten and twenty pupils per class, well below the state mandated maximum of 25 students. What this chart also shows is that many districts experienced falling class sizes during the past decade whereas a large number of districts saw an increase in average class size.

It is important to note, however, that the school districts with very small class sizes are often in small towns with aging populations. In 2017-18, for example, there were 23 school districts with twelve or fewer students in first- and second-grade classrooms. Errol, a tiny town in Coos County, had only 3.8 students per classroom! Because most of these 23 towns are not

very accessible to employment centers, one would not expect much demand for new housing construction and thus no threat at all to the local tax rate. However, New Castle, Newington, Newfields and South Hampton are four Seacoast towns with very small class sizes that would surely attract new residents if additional housing were built. The school districts of those four towns could easily accommodate more children by simply increasing class size and utilizing their existing teaching staff.

What can we say about the larger towns and cities where new residents might want to put down roots and raise families? Do those communities have class sizes that are small enough so that new students could be educated without large increases in instructional costs? The evidence in this case is somewhat mixed. As the following table shows, nine of eleven large school districts have witnessed a decline in class size during recent years. Those recent decreases would permit these districts to increase total enrollment by simply returning their average class sizes to the levels of 2015-16. Manchester stands out as a district that would have some difficulty enrolling more students without hiring more teachers. Derry, Merrimack, and Salem – on the other hand – could easily serve more students simply by raising class sizes.

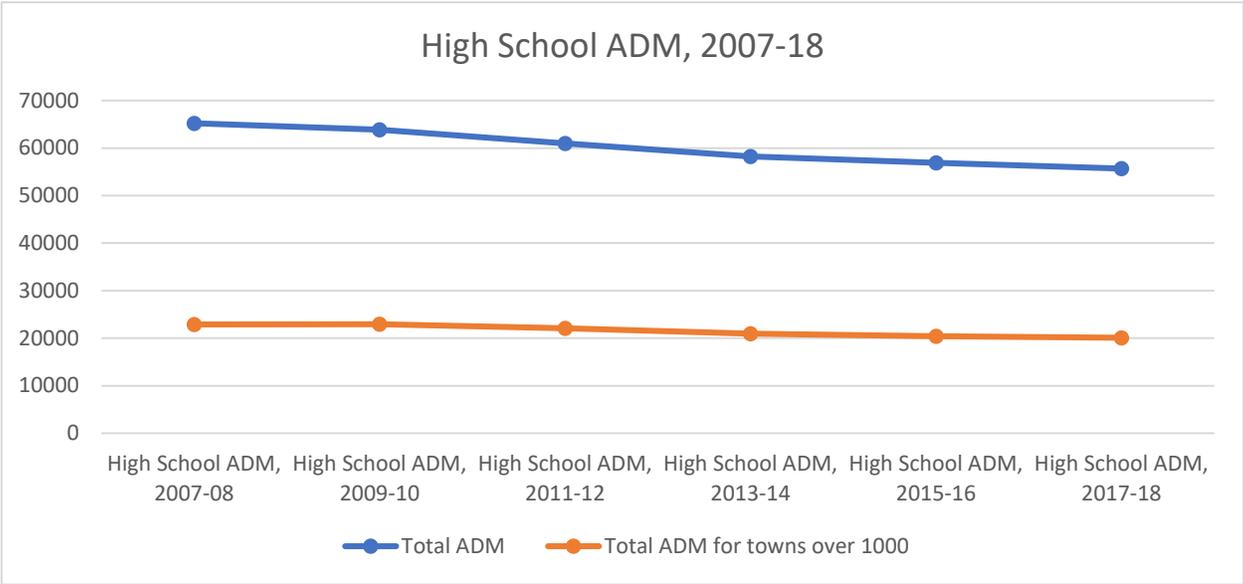
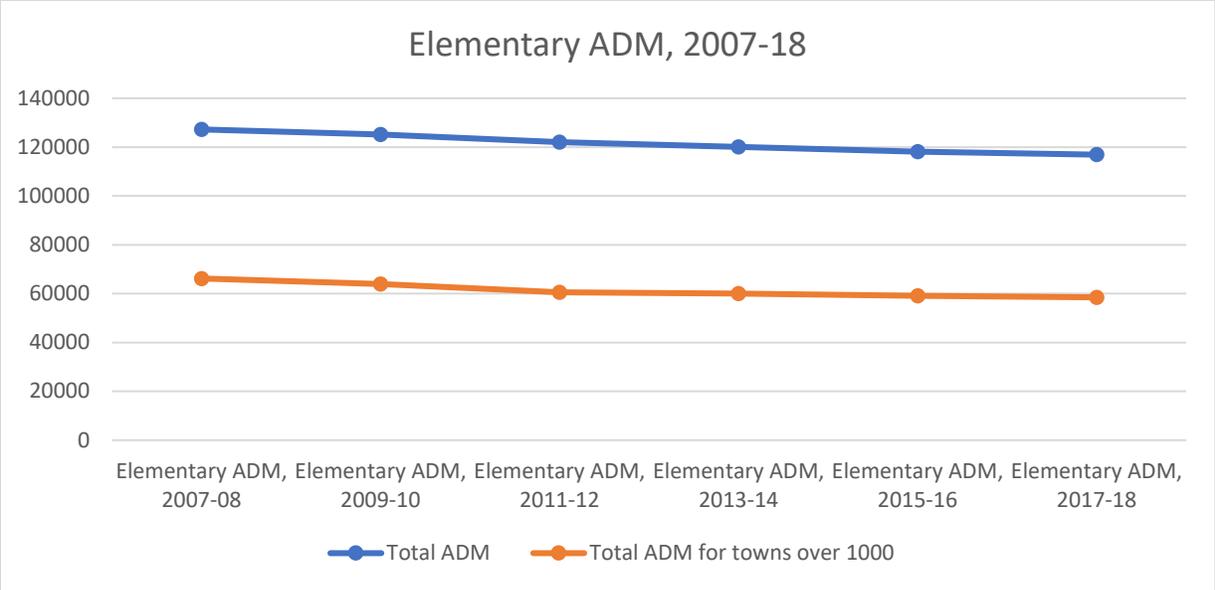
Average Class Size, Grades 1&2, Larger Districts		
	2015-16	2017-18
Bedford	18.9	18.6
Concord	18.5	19.4
Derry	18.4	16.9
Dover	20.2	19.7
Hudson	18.0	18.3
Londonderry	19.1	18.7
Manchester	21.0	20.8
Merrimack	19.1	17.5
Nashua	19.2	18.0
Rochester	19.1	18.0
Salem	15.9	16.5

Note: Larger districts are defined as those with more than 2000 elementary students in 2017-18.
 Source: NH Department of Education, *Average Class Size by District in Public Elementary Schools*.

Analysis of Enrollments and Tax Rates for NH Towns & Cities

The first section of this report deployed several economic and accounting principles to shed some light on whether or not an increase in public school enrollment forces a community to raise its property tax rate. This discussion might have seemed a bit hypothetical to the reader, however, because most of the data offered came from a single school district, the City of Concord. In this section, I analyze data for all 234 towns and cities and all 167 public school districts in New Hampshire. These data for the last decade provide compelling evidence that changes in tax rates for local public education have *not* been determined by changes in the resident student population of the towns and cities.

The first point to be made is that growth of enrollment in public schools has not been an issue in New Hampshire as a whole during the last decade. As we can see from two charts below, the number of pupils at the elementary and secondary levels of schooling in New Hampshire declined from 2007-08 to 2017-18. Total elementary student population declined by 10,320 children during this decade. Roughly $\frac{3}{4}$ of that decline took place in towns and cities with a thousand or more resident pupils. Total secondary enrollment declined by 9537 pupils over ten school years. The decline in the number of high school students in towns and cities with a thousand or more resident pupils was nearly 2800.



Not all of the towns and cities in New Hampshire experienced a decline in resident student population during this decade, however. Of the state's 234 municipalities, a total of 29 communities experienced growth in enrollment from 2007-08 to 2017-18. (See table below.) In some cases, this growth was quite modest, e.g. Nottingham. In other cases, growth of student population was quite substantial, e.g. Dover, Greenland and Windham. We need to see whether or not these 29 communities experienced larger increases in local education tax rates than those towns and cities that witnessed a contraction of student population during the same decade.

Towns and Cities with Elementary ADM Growth, 2007 AY to 2017 AY* (percentage change)			
Andover	12.44	Madbury	27.34
Ashland	10.74	Manchester	0.83
Auburn	3.74	Milan	11.13
Barrington	6.30	New Boston	8.50
Campton	4.43	Newmarket	11.66
Deerfield	0.58	Nottingham	1.32
Dover	16.36	Ossipee	2.43
Dunbarton	7.24	Penacook	7.76
Durham	9.56	Somersworth	4.35
Effingham	6.80	Stoddard	56.68
Epping	6.75	Sutton	38.43
Greenland	23.17	Thornton	8.19
Hopkinton	2.25	Tilton	32.47
Lempster	1.41	Windham	22.01
Lyme	6.57	N = 29	

* Towns with ADM growth but fewer than 100 elementary students in 2017-18 not included.
Source: Calculations by author using NH Department of Education data.

Let us begin that analysis by looking at eleven larger districts with 2000 or more elementary students in 2017-18. (See table below.). Two of those districts, Dover and Manchester, experienced elementary enrollment growth. Only Dover experienced substantial growth, 16.4 percent over a decade. The other nine larger districts witnessed a contraction in elementary student population. In four of these cases (Hudson, Londonderry, Merrimack and Salem), the percentage decline over the decade exceeded 15 percent.

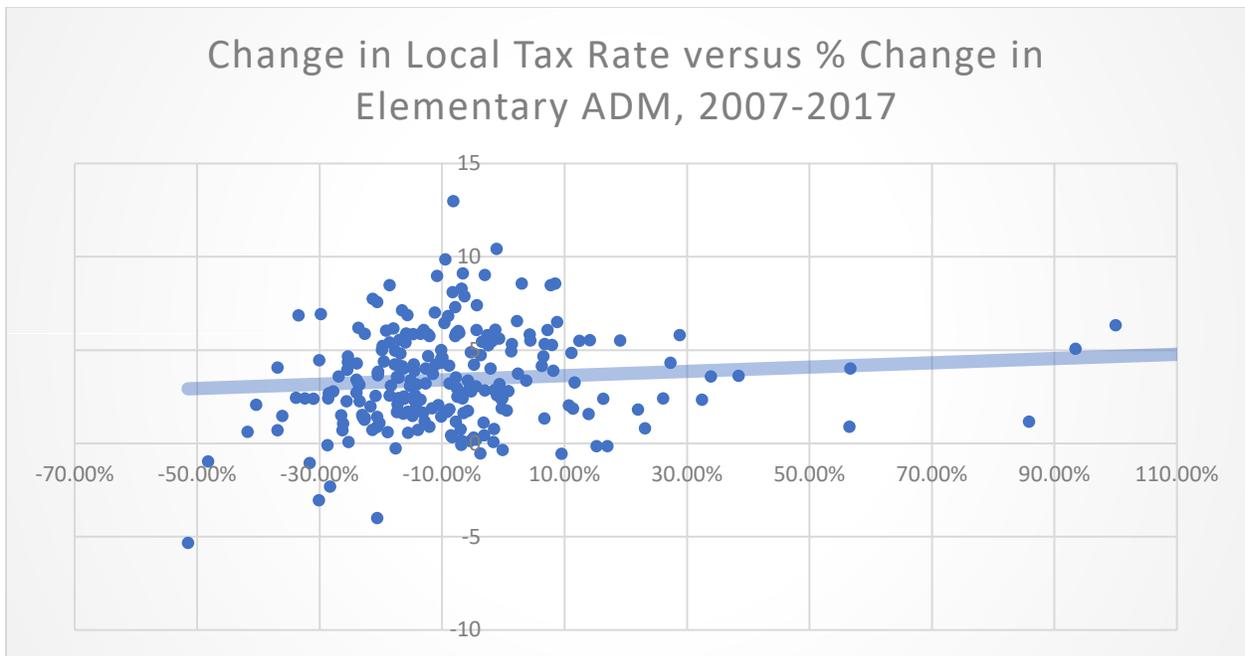
Several facts about these larger districts are quite striking:

- All eleven of these districts had an increase in the property tax rate to support the local public schools. Even the nine communities with *declining* student populations experienced an increase in their tax rate during the decade of our study.
- Dover, the one town or city with substantial growth of student population, had a *smaller* increase in tax rate than six of the communities with contracting student enrollments. This fact provides some preliminary evidence that student enrollment is not the primary driver of the local tax rate for public schools.
- The *largest* increase in tax rate came in Salem, a town that experienced a nearly 20 percent decline in the number of elementary students during the decade.

Elementary Enrollment and Tax Rate Changes in Larger Districts, 2007-2017		
	% change in elementary ADM in residence	Change in local education tax rate (\$ per thousand of equalized valuation)
Bedford	-4.50	0.21
Concord	-11.07	4.21
Derry	-12.65	4.01
Dover	+16.36	2.38
Hudson	-17.07	3.51
Londonderry	-21.66	1.98
Manchester	+0.83	2.80
Merrimack	-15.13	3.37
Nashua	-0.24	1.88
Rochester	-4.44	3.05
Salem	-19.46	4.38

Note: Larger districts are defined as those with more than 2000 elementary students in 2017-18.
Source: Calculations performed by author using NH Department of Education data.

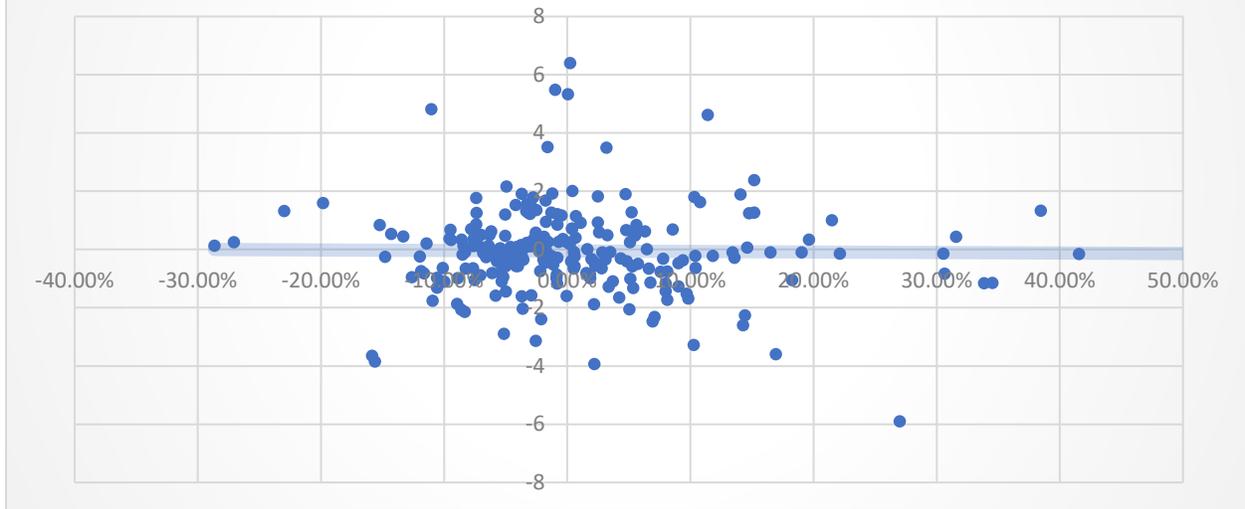
With this preliminary analysis in place, let’s look at the relationship between changes in enrollment and changes in tax rate for all 234 towns and cities in New Hampshire. Consider the ten years from 2007-08 to 2017-18. The following scatter diagram shows the percentage changes in resident student population (x-axis) and changes in local education tax rate (y-axis). The tax rate is measured as dollars of tax paid per \$1000 of equalized valuation.



The linear trendline fitted to this scatter plot has a small positive slope but the R squared is only 0.01. This means that most of the variation in changes in tax rates during the decade *cannot* be explained by changes in enrollment during the same time period. In fact, there are large differences in tax rate changes at any particular level of expansion or contraction of elementary ADM. Notice that a large number of towns and cities experienced *higher* tax rates during the decade even though their student populations *contracted*. In fact, only seven communities experienced both a contraction of elementary ADM and a lower tax rate in support of local public schools.

To further explore this tax rate-enrollment relationship, consider the shorter time period from 2015-16 to 2017-18. The scatter plot below displays the relationship for these two recent years.

Change in Local Tax Rate by % Change in Elementary ADM, 2015-2017



What this scatter plot reveals is that over this two year period, there was no correlation at all between the percentage change in resident student population and change in local education tax rate ($R^2 = 1/5000$). Even more striking is the fact that there were a number of towns with lower education tax rates despite elementary ADM growth and a number of towns with higher tax rates despite contraction of resident student population.

Conclusions

This report has touched upon a number of important and sometimes controversial topics in public policy: the property tax, the funding of public schools, the sources of student achievement, housing affordability, etc. It is not possible in a brief report to thoroughly address all of those complex topics in detail. Rather, this report seeks to answer a very simple question that is nonetheless a very important one: Will the construction of new homes in a community and the enrollment of additional children in its public schools necessarily raise the property tax rate? Using three types of analysis, I believe I have shown that the answer is definitely not.

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