Evaluating the Impact of School District Mergers in Vermont: Fiscal Reallocation, Equity, and Community Perspectives

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Abstract

This study examines the causal effects of school district mergers on educational spending, budget allocations, tax rates, and perceptions of equity in Vermont, exploiting a series of voluntary and mandated mergers from 2017 to 2020 as a natural experiment. Utilizing a difference-in-differences methodology across a panel of 109 districts, I analyze the financial repercussions of merging. The findings indicate no substantial impact on overall per-pupil spending or its growth rate post-merger. Tax rates were similarly unaffected. However, I observe a significant reallocation of funds, with merged districts reducing spending on administrative support and contracted services, while increasing expenditure on salary and benefits, teacher and student support, materials, and transportation. This shift underscores the complexity of mergers, suggesting both economies of scale in administrative functions and potential diseconomies from broader resource distribution. Interviews and surveys with administrators supplement these results, revealing divergent experiences that range from efficiency gains to challenges in community engagement and resource logistics. The study adds to the existing literature by providing nuanced insights into the fiscal and operational impacts of district mergers, highlighting the critical need for precise policy goals and effective execution frameworks, especially in settings like Vermont where education systems are closely linked to community values and governance structures.

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1 Introduction: Motivation and Summary, Related Literature

1.1 Motivation and Summary

The organization of educational governance structures to enhance cost efficiency and improve equitable student outcomes presents a complex challenge. Since the mid-20th century, the escalation in education costs has not translated into significant improvements in student achievement (Odden & Clune, 1995). This disparity has led several states to reconsider their educational governance frameworks. Notably, the consolidation movement from 1930 to 1970 reduced the number of school districts from roughly 200,000 to 20,000 in an attempt to increase specialization and efficiency. Yet, today several district structures that complicate financial and administrative processes remain (Berry, 2006). For example, Nebraska has several small, non-contiguous districts, while New Jersey has instances of districts spending $50,000 per student for regional high school education, starkly contrasting with the state's average of approximately $17,000 per student (Howley et el., 2011). Since 2000, the topic of consolidation has resurfaced, particularly during periods of economic downturn, with one in every nine school districts merging between 2000 and 2015 (Collins, 2019). States like Kentucky, West Virginia, and Ohio have encouraged mergers by offering funding for new schools that meet specific size criteria, hoping to address the fiscal limitations of smaller districts reliant on state capital for construction projects (e.g., Arkansas Act 60; Howley et al., 2011).

Despite the prevalence of mergers, the empirical evidence on their impact is limited and inconclusive, leaving questions about their efficacy in achieving cost efficiency and equitable student outcomes unanswered. The majority of existing research focuses on pre-consolidation cost analysis or post-consolidation qualitative feedback from administrators, with only a handful of studies using regression analysis to examine the impact of mergers on school spending (Duncombe and Yinger, 2007; Gordon and Knight 2008; Chin 2023). This paper presents new evidence on the causal effect of school district mergers on spending, budget allocations and tax rates and explores qualitative measures of student equity. I take advantage of a natural experiment of a series of voluntary and mandated school district mergers in Vermont from 2017 to 2020. The empirical strategy leverages variation in the timing of mergers across districts, providing a quasi-experimental setup to infer causality. Specifically, I employ a difference-in-difference comparison of spending, budget allocations, and tax rates on merged and unmerged districts.

I find no evidence that district mergers have led to significant savings in per pupil spending or slowing of its growth rate. Specific budget allocation categories were significantly altered however. Experiencing a merger led to a significant average decrease in spending per pupil on administrative support and contracted services by $386.87 and $2,168.6 respectively. This reduction in spending was reallocated to spending per pupil on salary and benefits, teacher and student support, materials, and transportation by $1,212.13, $87.65, and $166.14 respectively. Absent reallocation, the savings in administrative support and contracted services represent 6.5% of the average budget for merged districts in 2024.

I find weak evidence that tax rates were lowered as a result of the merger, with the only year experiencing a significant decline being the first year after the merger, -.02. This finding aligns with the estimate for overall

spending per pupil. Since tax rates are linked to this metric for districts, and spending per pupil was not significantly altered, the change in tax rates can be attributed to the financial incentives in place for districts to merge.

Interviews and surveys with administrators provide a layered view of the effects of school district mergers, particularly highlighting shifts towards greater student equity and more holistic, district-wide educational strategies. Administrators observed a notable change in school board discussions, moving from focusing on the needs of individual schools to embracing a broader district-wide perspective, which facilitated equitable access to curriculum and resources. Additionally, mergers were credited with enabling the distribution of special education and capital construction costs over a wider base, easing financial pressures on smaller districts. The shared hiring of supportive roles across schools emerged as a benefit, enhancing educational support services. However, the reception to these changes was mixed; while some administrators emphasized the positive impact on equity, others voiced concerns over weakened community connections and increased logistical costs due to the sharing of personnel and materials.

These insights underline the complexity of assessing mergers' impact solely in quantitative terms. At the same time however, relying entirely on anecdotal evidence to gauge the success of district merger policies is concerning as well, stressing the need for a balanced analysis approach that incorporates both qualitative and quantitative analysis. Administrator testimony compiled in this project reveals both the nuanced outcomes mergers have on student equity and district functionality and suggests that the adjustment period following mergers may be extensive, potentially revealing more significant effects as districts continue to adapt to their new structures.

Vermont's rural landscape and historical reluctance to governance changes present an ideal backdrop for examining the outcomes of district mergers. The state's implementation of Act 153 (2010) and Act 46 (2015) sought to create "sustainable governance structures" amidst declining student numbers and rising educational expenses (No. 153, 2010; No. 46, 2015). From 1997-2011, Vermont experienced a 57% increase in inflation-adjusted per-pupil expenditures, alongside a 20% decrease in enrollment (Rogers et al., 2014). In 2014, Vermont had the nation's smallest school districts, lowest student to board member ratio, and the highest per pupil spending, but did not experience corresponding improvements in educational outcomes (Rogers et al., 2014). The combined effect of Act 153 and 46 led to 206 districts forming 50 new union school districts, a reduction of 156 districts in total (State of Vermont Agency of Education, 2017).

This paper makes 4 important contributions to the current literature on school district mergers. First, it adds to the limited number of studies that employ regression analysis to understand the effect district mergers as an intervention have on education spending, offering new insights into how these structural changes influence financial allocations within the education sector. Secondly, it distinguishes between the terms 'merger' and 'consolidation,' which have been used interchangeably in previous research. Unlike earlier policies that led to school closures, Vermont's Acts 153 and 46 notably resulted in minimal closures, challenging the assumption that economies of scale necessitate school consolidation. This distinction is crucial, especially for rural contexts where schools serve as community hubs and voters place high value on local control. Third, by integrating both quantitative and

qualitative analyses, this paper addresses the shortcomings of prior studies that relied on a singular methodology to assess the outcomes of district mergers. Lastly, it underscores the importance of policy consensus and effective implementation strategies for achieving the desired economies of scale, while also highlighting the potential for diseconomies post-merger. This comprehensive examination, facilitated by Vermont's unique educational landscape and legislative approach, fills a significant gap in existing research and sets the stage for further exploration into the nuanced effects of school district consolidation.

The paper is structured as follows. The following section reviews prior research on district consolidation efforts and their impacts on student outcomes and budgets. Section 2 provides background on Vermont's district organization structure, consolidation legislation, and financing formula. Section 3 and 4 outline the data used and empirical framework employed in the analysis. Section 5 presents the regression and interview findings. Finally, the concluding section evaluates the effectiveness of consolidation in Vermont, discusses contemporary policy implications, and outlines directions for future research.

1.2 Related Literature

The transformation of educational governance in the United States over the last ninety years is marked by a substantial reduction in the number of school districts; from 117,108 in 1939 to 13,862 by 2006, nearly a 90% decline (Duncombe & Yinger, 2010). This trend towards district mergers and consolidations has been a focal point of academic scrutiny and debate, reflecting its enduring significance and influence on educational policy (Berry & West, 2010; Cubberley, 1922). However, debates about the effectiveness of mergers in realizing economies of scale and enhancing student achievements present varying perspectives.

Advocates of district mergers posit that consolidation fosters district and school efficiency, facilitating economies of size (Duncombe and Yinger, 2007). The concept of economies of size, correlating per-pupil expenditure with enrollment, suggests cost benefits accruing from increased scale. Preliminary cost analyses have predicted efficiency gains from mergers (Andrews, Duncombe, & Yinger, 2002; Kenny, 1982; Chakraborty et al., 2000), though empirical validations of these efficiency improvements post-merger are scarce. Despite identifying administrative and instructional redundancies, these studies often neglect the potential diseconomies of scale larger districts might face, raising concerns about the accuracy of these estimations.

Recent literature examining consolidation as an intervention tends to focus on outcomes such as achievement, housing prices, and teacher responses rather than fiscal impacts (Brummet, 2014; Beuchert et al., 2018; Berry & West, 2008; Hu & Yinger, 2008; Nitta et al., 2010). Within this domain, few studies have rigorously tackled the financial consequences of district mergers. A noteworthy exception is the work by Duncombe & Yinger (2007), which evaluates the consolidations of rural districts in New York between 1985 and 1987, demonstrating marked reductions in operational costs, especially for smaller districts. Nonetheless, the limited scale of their analysis, involving only 12 units in the treatment group, limits its generalizability and the depth of insights into the broader

financial implications of district mergers.

Economic theories underscore the potential of mergers to enhance student achievement and equity, suggesting that additional educational investments can improve metrics such as test scores and academic attainment (Candelaria & Shores, 2019; Hyman, 2017; Lafortune et al., 2018). Merged districts are theorized to offer superior personnel, academic programs, and extracurricular activities, improving student outcomes.

Conversely, several critics argue against mergers, highlighting potential inefficiencies in larger districts due to increased transportation costs, more formidable teachers' unions, and amplified bureaucratic layers, all potentially detracting from community engagement and educational motivation (Chin, 2023). Empirical studies often report diminishing returns to scale, with particular adverse effects on African American and low-socioeconomic status students in large schools (Summers & Wolfe, 1977; Lee & Smith, 1997), suggesting non academic benefits of smaller schools such as enhanced community belonging and closer adult interactions. However, much of the quantitative research critiquing district mergers effect on expenditures relies on methodologically weak approaches, such as visual trend analysis and simple correlation calculations, thus challenging the causality of observed effects (see Cooley & Floyd, 2003; McGee et al., 2022). Recent studies utilizing difference-in-difference methodologies to assess the impact of mergers on district expenditures have found no evidence of overall per-pupil savings. However, these investigations fall short of exploring the underlying reasons for the absence of fiscal benefits, generating ambiguity around whether mergers inherently lack the potential to influence savings or if outcomes are contingent on additional variables (Chin, 2013; Gordon and Knight 2008).

This paper adds to the limited body of research offering causal evidence on the effects of school district consolidations. It stands out by focusing on Vermont's merger policy, which resulted in bureaucratic instead of physical school consolidations, exploring the possibility of achieving economies of scale without closing schools. Additionally, by integrating qualitative data from administrators, this study aims to deepen the comprehension of the consolidation process, overcoming the limitations of previous research that relied exclusively on either quantitative or qualitative methods.

2 Background

2.1 Vermont School Districts

In 2010, 291 school districts served Vermont students, creating the lowest student to board member ratio in the country and an average of 309 students per district. This large number of school districts is primarily a result of Vermont's complex educational governance structure. Historically, Vermont's educational system evolved from small, locally managed schoolhouses, leading to a highly fragmented district structure where individual schools that served kindergarten through sixth or eighth grade often functioned as independent districts (Weiss-Tisman, 2023). This arrangement fostered a strong sense of local control but also contributed to inefficiencies and inequities in

educational resource allocation and outcomes (Perrault, 2011).

The Vermont Legislature, responding to rising concerns over the efficiency and equity of education outcomes across the state, implemented Acts 153 (2010) and Act 46 (2015), aiming to streamline educational governance through consolidation while maintaining a commitment to local input and control. These acts sought to improve educational outcomes, achieve equity across districts, and realize cost efficiencies by encouraging the formation of unified union school districts. Specifically, the legislative report on Act 46 states in incontrovertible but vague language that the purpose is to;

> encourage and support local decisions and actions that: (1) provide substantial equity in the quality and variety of educational opportunities statewide; (2) lead students to achieve or exceed the State's Education Quality Standards, adopted as rules by the State Board of Education at the direction of the General Assembly; (3) maximize operational efficiencies through increased flexibility to manage, share, and transfer resources, with a goal of increasing the district-level ratio of students to full-time equivalent staff; (4) promote transparency and accountability; and (5) are delivered at a cost that parents, voters, and taxpayers value.

2.2 The Natural Experiment

The Vermont Legislature began the multi-year merger process with Act 153 (2010) which encouraged voluntary mergers and offered incentives for districts to collaborate or merge into larger, more efficient units known as Regional Education Districts (REDs). Once proposed, a merger was only implemented if each town involved had a majority consenting vote. Despite these efforts, the desired consolidation outcomes were not fully achieved, leading to the enactment of Act 46 in 2015 (legislative report on act 46).

Act 46 aimed to accelerate the merger process by establishing a clear preference for unified union school districts as the model governance structure. This legislation outlined a multi-year, phased approach to encourage voluntary mergers initially, with provisions for forced mergers if voluntary consolidation did not occur. The goals, as articulated by the legislature, once again included improving educational outcomes, achieving equity across districts, and realizing cost efficiencies through scaled governance structures.

The merger process under Act 46 was designed to be participatory, involving extensive consultation with affected communities, school boards, and educational professionals. School districts were required to evaluate their ability to meet state-defined education goals independently or through merger proposals. The State Board of Education played a crucial role in this process, reviewing proposals and making final decisions on district alignments to ensure compliance with the legislative objectives.

2.3 Vermont Education Funding Formula

Vermont's education funding mechanism stands out for its complexity and is crucial for understanding the ramifications of the state's merger legislation. Following the state Supreme Court decision in Brigham v.

State, Vermont introduced Act 60 (1997) and Act 68 (2003), fundamentally transforming its education funding system(Downes, 2004). These laws were designed to disconnect school budgeting from local property wealth, ensuring equitable funding across districts, especially for those with a higher need student population, without placing undue stress on local taxpayers. This reform aimed to equalize educational opportunities throughout Vermont, sparking widespread discussions about its efficacy both within the state and across the nation (Downes, 2004).

The funding model begins with each district proposing a budget for local approval. After accounting for categorical aids and adjustments, the district's educational spending is determined and then divided by the "equalized pupils" count, which is a weighted figure adjusting for various factors including grade level and socioeconomic status, thereby reflecting the cost of education more accurately. This formula prioritizes students with higher educational costs, intending to distribute funds more equitably based on student needs.

Revenues for these budgets are sourced from the State Education Fund, primarily supported by property and state taxes. The formula calculates homestead property tax rates based on per-pupil expenditure, ensuring uniform tax rates for districts with similar spending, irrespective of their property wealth. This approach seeks equity by mitigating the impact of property wealth on educational funding and enabling districts with more equalized pupils to support higher budgets without exorbitant tax implications.

The study explores how district mergers, by potentially modifying the equalized pupil count and district demographics, affect budgets, per-pupil expenditures, and tax rates under Vermont's distinctive funding framework. It highlights the interplay between Vermont's innovative funding model and district consolidation, offering insights into the financial outcomes of mergers. Additionally, this funding formula illustrates Vermont's effort to maintain a balance between local autonomy and state-provided equitable education funding, a theme that continues to be at the forefront of the state's educational policy discourse.

2.4 Current State of Vermont Education Finance

Since the turn of the century, Vermont has experienced a significant increase in inflation adjusted per pupil spending, driven by dwindling student numbers and an evolving perception of public education's role, which now integrates many aspects of social support (Rogers et, al. 2011). This surge in spending has amplified the strain on property taxes, causing widespread local dissatisfaction and pushing the state's education funding mechanisms to their brink. Superintendents have reported operating schools where per-pupil spending in Vermont schools has reached up to $40,000, underlining the severity of these fiscal strains (Downes, 2004).

Compounding these financial strains are Vermont's significant infrastructure challenges. A considerable number of the state's educational facilities require urgent renovations or replacements due to their deteriorated condition and the presence of environmental hazards like PCBs. A case in point is Burlington High School, which has resorted to using a vacant mall since 2021 following the discovery of PCBs in the school's structure (Meisenzahl,

2021) To address this, the Burlington School District approved a significant bond for building a new high school, an expense that is felt across the state due to Vermont's education funding model. Similarly, North Country Union High School's recent expenditure of $489,000 for PCB mitigation underscores the pervasive nature of these infrastructure issues. The financial demands for addressing such problems often exceed the capacities of smaller districts, highlighting the potential advantages of district mergers in enabling critical infrastructure projects.

In 2021, amidst these funding and infrastructure challenges, Vermont passed additional legislation in response to a report revealing significant flaws in the state's pupil weighting factors (Kolbe et al., 2017). This report criticized the existing weights for lacking empirical support and perpetuating inequities in funding across districts. Act 146 was enacted to revise these weights, leading to financial adjustments for various districts—some facing losses and others gaining. Initially, to mitigate impacts on districts that would see increased costs, the legislature introduced a 5% cap on tax increases. This cap encouraged many districts to rapidly increase their budgets to fund expansions and renovations. However, the subsequent removal of this cap has left districts navigating a complex financial landscape, characterized by expanding budgets, construction challenges, and the pressing need for equitable funding adjustments.

This unfolding situation in Vermont reflects the broader national education finance crisis, where states grapple with balancing equitable funding, local control, and fiscal sustainability. Across the United States, educational finance systems are under increasing scrutiny as they confront rising costs, infrastructure decay, and the challenge of ensuring equitable access to quality education. Vermont's experience highlights the critical need for innovative policy solutions that can address these multifaceted challenges while adapting to changing societal expectations of public education.

3 Data

3.1 Merger Data

This study comprises a primary panel dataset of 109 districts, including 49 that underwent mergers (treatment group) and 60 that did not (control group). Districts that demerged prior to 2024 or lacked comprehensive data were excluded to maintain analytical precision. Following Gordon and Knight's (2008) methodology for analyzing district mergers in Iowa, this dataset consolidates all pre- and post-merger data for each final district, identifying mergers as significant treatment events. Merger-related data, including details on consolidation actions, resultant district structures, and merger timings, were procured from Brad James, Education Finance Manager at the Vermont Agency of Education (AOE). This dataset delineates the district affiliations of Vermont towns from 2009 to 2024, facilitating the construction of my final aggregated district entities.

Brad James also provided AOE fiscal calculation data that contained information that created my outcome variables. These files contained data on districts local education spending (LES), average daily membership (ADM),

equalized pupil counts (EQP), and tax rates. LES denotes the approved district budget after subtracting district revenues. ADM counts the students residing within a district, while EQP represents a weighted ADM adjusting for factors like grade level, socioeconomic status, and English language proficiency. The study calculates per pupil expenditure (LES/EQP) to determine district tax rates. This paper's outcome variables—tax rates, per pupil spending, and spending growth rates—rely on complete data for these metrics across the observation period.

Preliminary balance tests on district size, household income, and per pupil spending, conducted to verify the random assignment of mergers, showed no significant pre-merger differences between treatment and control groups, reinforcing the study's methodological robustness (Brasington, 1999). Despite a notable discrepancy in ADM among a few districts, adjusted analyses confirm that this discrepancy does not substantially affect the study's outcomes, affirming the merger's independent impact (see tables 1 and 2).[†]

Table 1: Data Characteristics for Merged and Non-Merged Districts

	Merged		Non-Merged	
	Mean (SD)	Median	Mean (SD)	Median
ADM	297.32 (213.645)	228.99	521.48 (709.45)	285.34
Income	37.87 (6.58)	36.8	36.39 (8.9)	33.8
Spending per Pupil	13.12 (1.08)	13.31	13.12 (1.45)	12.87
Growth in Spending Per Pupil	.03 (.007)	.03	.03 (.015)	.03

Table 2: Data Characteristics for Merged and Non-Merged Districts Excluding Districts more than 1,000 ADM

	Merged		Non-Merged	
	Mean (SD)	Median	Mean (SD)	Median
ADM	297.32 (213.645)	228.99	267.8 (220.85)	221.48
Income	37.87 (6.58)	36.8	36.39 (8.9)	33.8
Spending per Pupil	13.12 (1.08)	13.31	13.12 (1.45)	12.87
Growth in Spending Per Pupil	.03 (.007)	.03	.03 (.015)	.03

3.2 Budget Allocation Data

The AOE provided detailed expenditure records from 2009 to 2023, employing a coding system to categorize education spending by function, object, and project. Due to significant coding changes, with a completely new system in 2020, custom coding buckets were developed to ensure consistent analysis across fiscal years, informed by insights from superintendents, principals, and AOE finance personnel. The resulting allocations analyzed for the function category are direct instruction, teacher and student support, administrative support, transportation, finance, and food. The resulting allocations analyzed for the object category are salaries and benefits, services, materials, finance, special education, and transportation. The resulting allocations analyzed for the project category are regular education, special education, co-curricular or extracurricular education, additional programs, finance, construction, and food.

[†]There are only ten non-merged school districts with more then 1,000 students. All regressions were run with and without these units, with no significant change in results. To increase statistical power, these districts were kept in the final data set.

3.3 Interview & Survey Data

The stated intentions of Act 46 require multiple levels of analysis. The AOE claims in their 2018 merger progress report that benefits of Act 46 are extensive, such as providing opportunities to "even out" enrollment among schools and improve student to teacher ratios. Due to the scope of this project, I am unable to gather quantitative data necessary to provide evidence for this level of nuance. Instead, I looked to capture the intricate experiences of the merger process through interviews with superintendents across the state. In addition to providing extra insight and explanation for the quantitative analysis in this paper, these interviews also address the gap in literature that gives voice to the experiences of school administrators on the ground with the mergers.

The AOE provides a spreadsheet that contains all superintendents supervisory union's phone number, mailing address, and fax number. Using this spreadsheet and supervisory union websites, I compiled a list of every superintendents email, 56 in total, briefly explaining my research project and asking to set up a meeting to discuss the merger process, Vermont's funding formula, and how they both have affected their supervisory union. 10 superintendents replied, and I had a meeting via zoom or phone call with 9 of them.

In addition to the superintendent perspective, I wanted to gain insight into the perspective of principals on the merger process. To accomplish this, I sent out an email to every single principal of a school that operates within a merged district. The AOE provides a spreadsheet of every Vermont school principal with their mailing address, fax number, and phone number, yet this spreadsheet does not provide their email address nor what district each school is a part of. As a result, I used the National Center for Education Statistics to find the schools that operate within each merged district, and then went to each school's website to locate the email of the principal(s). I sent out an email to 183 principals in total.

The following questions were included in the emails and used to guide the conversations via zoom and phone call

1. How would you characterize the process leading to your school district merger - as voluntary, mandated, or a combination of both?
2. In your opinion, has the merger resulted in financial benefits for your district? If so, could you provide specific instances of cost savings? Were these savings solely reflected in budget reductions or were funds reallocated to other areas?
3. If the merger hasn't generated financial savings for your district/school, what factors do you believe contributed to this outcome?
4. Initially, how did your school district perceive the idea of merging? Was there a difference in opinion between families and school administrators? Have attitudes shifted since then?
5. From your perspective, do you think mergers offer a viable solution to Vermont's funding challenges, particularly those related to school construction and Act 127?
6. Is there any additional aspect related to mergers or Vermont's education funding that you would like to comment on?

I received 14 responses. As expected, a problem encountered with the principal survey was that many current principals were not around when the school underwent a merger. To get more information, I sent the same list of questions to all superintendents that preside over a merged district(s) who I had not already talked to via interview. I emailed 27 superintendents and received a response from 7.

The current divisive climate surrounding educational finance in Vermont may have influenced the range of responses received from principals and superintendents creating response bias. Those who chose to participate in the study and provide statements might represent a subset of educational leaders who are either more open to discussing the subject or hold particularly strong opinions about it. This selective participation could mean that the perspectives and experiences of administrators from districts where the issue of mergers is more contentious or polarized are underrepresented in the dataset. Consequently, the feedback gathered might skew towards viewpoints that do not fully encapsulate the breadth of opinions and experiences across all Vermont districts.

Such biases in data collection can significantly affect the study's findings, presenting a version of the merger process and its outcomes that does not entirely reflect the diverse array of experiences and attitudes held by educational administrators across Vermont. Interview results should thus be interpreted with caution, acknowledging that they may not comprehensively represent all viewpoints within the state's education system.

4 Theoretical Framework& Specifications

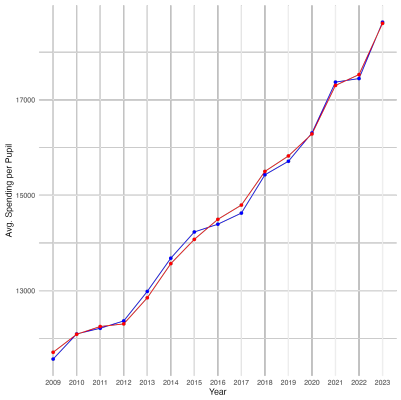
4.1 Theoretical Framework

The potential implications of school district consolidations on the efficiency and equity of public education have been a focal point for economists and educational researchers. Consolidation initiatives are posited to facilitate economies of scale, potentially enhancing the efficiency of the education production function (Chin, 2023). However, concerns have been raised about the potential negative impacts of increased school size on the personal connections between teachers and students, which are vital for student motivation and performance. The interplay between the size of schools and districts and their respective impacts on wages, as noted by Berry and West (2005), suggests that while larger districts might be associated with higher earnings, the benefits could be negated by the disadvantages of larger school sizes.

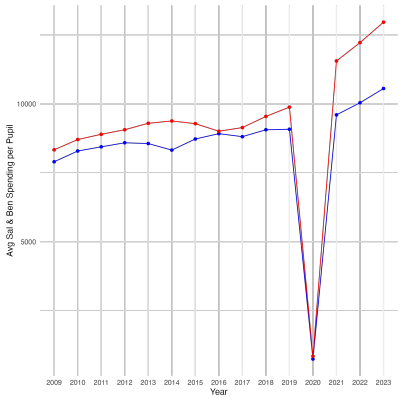
This study leverages a difference-in-differences (DiD) regression approach to empirically examine the effects of school district mergers on financial metrics and qualitative indicators of student equity. The DiD method compares pre- and post-merger changes in outcomes between districts that underwent mergers and those that did not, accounting for both fixed differences between groups and common trends over time. This strategy, underpinned by the assumption of parallel pre-merger trends between merged and unmerged districts, aims to isolate the causal impact of mergers from other temporal effects.

The DiD approach is predicated on the assumption that, in the absence of a merger, merged and unmerged districts would have followed parallel trends in the outcome variables. This assumption enables the attribution of deviations from these trends post-merger to the effect of the merger itself, rather than confounding factors. Preliminary graphical analysis, depicted in Figure 1 for selected outcome variables, corroborates this assumption by illustrating no discernible systematic divergence in the pre-intervention trends between the two cohorts for four of

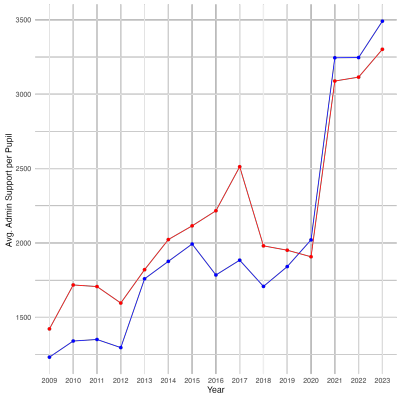
my outcome variables. Graphical analysis was conducted for all outcome variables as well but have been excluded here for efficiency. Graphs displaying the evolution of significant outcome variables overtime located in section 5 further confirm the parallel trends assumption. Merged districts are plotted in red and non-merged districts are plotted in blue.



(a) Education Spending per Pupil



(b) Sal & Benefit Spending per Pupil



(c) Admin Spending Per Pupil

(d) Transport Spending Per Pupil

Figure 1: Parallel Trends

Employing district fixed effects and temporal trends significantly mitigates the risk of endogeneity bias. However, these controls may not fully account for variables that both affect spending and influence the decision to merge, especially if these factors change in a nonlinear manner over time. In Vermont's context, the impact of such variables is minimized due to the mandates of Act 46, which required all districts to either propose a merger plan or justify the absence of a need for consolidation, with the final configurations being determined by the AOE. Given this framework, short-term changes in a district's socio-economic standing are unlikely to sway the decision towards consolidation. Therefore, incorporating district fixed effects and accounting for time trends should sufficiently guard against selection bias in this analysis.

Analyzing the consequences of school district mergers necessitates a methodological approach that simplifies the complex landscape of Vermont's education system. By treating post-merger districts as single, consolidated entities from the outset, this study aligns its observational unit with the structural reality post-consolidation. This

methodological decision, while facilitating a streamlined analysis, acknowledges the potential for obscured heterogeneity among merged districts, particularly where mergers aim to provide financial relief or distribute costs across a broader tax base. Benefits to smaller, financially weaker districts pre-merger might be diluted when aggregated with larger counterparts, potentially masking the targeted support mergers are designed to offer, such as enabling significant investments in special education or infrastructure.

Despite these considerations, this strategic methodological choice enhances analytical clarity facilitating a comprehensive examination of school district mergers' consolidated impact. Qualitative insights from school administrators complement this analysis, addressing nuances obscured by aggregation, while further quantitative exploration can illuminate the complex dynamics of district mergers.

4.2 Baseline Specifications

The baseline difference-in-differences (DiD) model we estimate is given by:

$$Y_{it} = \alpha + \beta \text{Merge}_{it} + \delta_t + \lambda_i + \varepsilon_{it} \tag{1}$$

where Y_{it} is the outcome of interest for school district i in year t. Merge_{it} is a dummy variable that equals 1 if the school district is operating as a merged entity in year t, and 0 otherwise. δ_t represents year fixed effects, capturing common shocks across all districts in year t. λ_i represents school district fixed effects, capturing unobserved time-invariant characteristics of each district. ε_{it} is the error term.

To examine the effect of merging in specific years (2017, 2018, 2019, 2020), we extend the model as follows:

$$Y_{it} = \alpha + \sum_{y=2017}^{2020} \left(\sum_{t=2010}^{2023} \beta_{yt} \text{Merge}_{y,it} \times \text{Year}_t \right) + \delta_t + \lambda_i + \varepsilon_{it} \tag{2}$$

where $\text{Merge}_{y,it}$ is a dummy variable for districts merging in year y (2017, 2018, 2019, or 2020). Year_t is a dummy variable for year t, allowing us to capture the effect of merging in year y on the outcome in each specific year t.β_{yt} represents the effect of being a merged district in year y on the outcome in year t.

5 Results

5.1 Regression Results

Initial findings, captured across Tables 3 through 5, reveal no significant impact of mergers on these outcome variables across any group, encompassing districts that merged from 2017 through 2020. This observation suggests that, at a macro level, district mergers do not fundamentally alter these key financial indicators.

However, when we narrow our focus to specific budget allocation categories, a more nuanced picture emerges. The detailed regression outputs, as shown from Tables 6 through 11, indicate significant effects of mergers

on particular financial aspects. The rest of the budget categories had no significant change due to merging. Administrative support spending per pupil decreases significantly in merged districts, particularly for those merging in 2019, which saw a reduction of $616.822 per student compared to non-merged districts, a significant shift at the 1% level. Conversely, merged districts on average saw an increase in salary and benefits spending per pupil by $1,212.126, a trend consistent across all merger years except for 2019.

Further analysis reveals that merged districts allocated $87.648 more per pupil on materials, an effect uniquely observed in the 2017 and 2018 cohorts. Spending on contracted services, however, dipped across the board for merged districts, with a notable decrease of $2,168.59 less per pupil, a trend unaffected by the specific year of merger. Interestingly, merged districts increased their expenditure on transportation and teacher and student support by $166.14 and $374.27 more per pupil, respectively, with transportation spending increases notable in the 2017 to 2019 merger cohorts and teacher and student support spending enhancements evident in all but the 2019 group.

Table 3: Effect of Merger on Spending per Pupil by Year of Merger

	Dependent variable:				
	Spending per Pupil				
	(All)	(2017)	(2018)	(2019)	(2020)
Merge	81.439	−418.059	112.020	29.121	171.956
	(110.317)	(350.292)	(220.234)	(168.594)	(181.717)
Constant	11,573.850***	11,511.030***	11,531.260***	11,511.370***	11,554.460***
	(296.516)	(325.991)	(314.771)	(334.683)	(303.748)
Dependent variable:	(1)	(2)	(3)	(4)	(5)
Observations	1,635	975	1,050	1,230	1,155
R^2	0.848	0.836	0.843	0.821	0.854

Note: *p<0.1; **p<0.05; ***p<0.01

Standard Errors reported in parentheses are hetero-skedastic robust. District and Time Fixed effects are included but not displayed.

Table 4: Effect of Merger on Growth of Spending Per Pupil by Year of Merger

	Dependent variable:				
			growth		
	(All)	(2017)	(2018)	(2019)	(2020)
Merge	−0.001	−0.003	−0.008	−0.007	0.009
	(0.007)	(0.024)	(0.015)	(0.010)	(0.012)
Constant	−0.336***	−0.336***	−0.331***	−0.338***	−0.339***
	(0.018)	(0.022)	(0.022)	(0.021)	(0.021)
Dependent variable:	(1)	(2)	(3)	(4)	(5)
Observations	1,635	975	1,050	1,230	1,155
R^2	0.713	0.650	0.655	0.673	0.679
Note:					*p<0.1; **p<0.05; ***p<0.01

Standard Errors reported in parentheses are hetero-skedastic robust. District and Time Fixed effects are included but not displayed.

Table 5: Effect of Merger on Tax Rates by Year of Merger

	Dependent variable:				
			Tax Rates		
	(All)	(2017)	(2018)	(2019)	(2020)
Merge	−0.027**	−0.053	−0.061***	−0.027	0.002
	(0.011)	(0.036)	(0.022)	(0.017)	(0.019)
Constant	1.224***	1.216***	1.217***	1.217***	1.220***
	(0.030)	(0.033)	(0.032)	(0.034)	(0.031)
Dependent variable:	(1)	(2)	(3)	(4)	(5)
Observations	1,635	975	1,050	1,230	1,155
R^2	0.743	0.736	0.739	0.712	0.757
Note:					*p<0.1; **p<0.05; ***p<0.01

Standard Errors reported in parentheses are hetero-skedastic robust. District and Time Fixed effects are included but not displayed.

Table 6: Effect of Merger on Admin Support Spending per Pupil by Year of Merger

	Dependent variable:				
	Admin Support Spending per Pupil				
	(All)	(2017)	(2018)	(2019)	(2020)
Merge	−386.872***	−244.600	−276.096	−616.822**	−197.004
	(128.424)	(437.884)	(279.540)	(193.337)	(228.621)
Constant	1,822.121***	1,876.260***	1,857.619***	1,812.801***	1,848.947***
	(345.186)	(407.507)	(399.535)	(383.800)	(382.149)
Dependent variable:	(1)	(2)	(3)	(4)	(5)
Observations	1,635	975	1,050	1,230	1,155
R^2	0.424	0.392	0.393	0.397	0.415
Note:					*p<0.1; **p<0.05; ***p<0.01

Standard Errors reported in parentheses are hetero-skedastic robust. District and Time Fixed effects are included but not displayed.

Table 7: Effect of Merger on Salary and Benefit Spending per Pupil by Year of Merger

	Dependent variable:				
	Salary and Benefit Spending per Pupil				
	(All)	(2017)	(2018)	(2019)	(2020)
Merge	1,212.126***	3,181.050***	3,112.912***	−33.984	1,075.601***
	(212.441)	(659.393)	(433.150)	(299.806)	(340.813)
Constant	7,112.169***	7,117.114***	7,101.259***	7,120.569***	7,116.815***
	(571.010)	(613.649)	(619.083)	(595.156)	(569.683)
Dependent variable:	(1)	(2)	(3)	(4)	(5)
Observations	1,635	975	1,050	1,230	1,155
R^2	0.842	0.854	0.849	0.842	0.854
Note:					*p<0.1; **p<0.05; ***p<0.01
					Standard errors in parentheses

Standard Errors reported in parentheses are hetero-skedastic robust. District and Time Fixed effects are included but not displayed.

Table 8: Effect of Merger on Materials Spending per Pupil by Year of Merger

	Dependent variable:				
	Materials Spending per Pupil				
	(All)	(2017)	(2018)	(2019)	(2020)
Merge	87.648***	132.566*	345.965***	−0.510	54.402
	(21.552)	(68.645)	(44.789)	(30.613)	(35.876)
Constant	534.149***	534.284***	535.168***	540.701***	529.167***
	(57.930)	(63.883)	(64.015)	(60.772)	(59.968)
Dependent variable:	(1)	(2)	(3)	(4)	(5)
Observations	1,635	975	1,050	1,230	1150
R^2	0.703	0.703	0.709	0.702	213.5
Note:					*p<0.1; **p<0.05; ***p<0.01
					Standard errors in parentheses

Standard Errors reported in parentheses are hetero-skedastic robust. District and Time Fixed effects are included but not displayed.

Table 9: Effect of Merger on Services Spending per Pupil by Year of Merger

	Dependent variable:				
	Contracted Services Spending per Pupil				
	(All)	(2017)	(2018)	(2019)	(2020)
Merge	−2,168.588***	−2,885.259***	−3,979.084***	−1,021.240***	−2,814.319***
	(219.195)	(716.793)	(449.531)	(319.500)	(374.818)
Constant	657.480	665.238	633.186	673.003	613.228
	(589.164)	(667.067)	(642.495)	(634.253)	(626.523)
Dependent variable:	(1)	(2)	(3)	(4)	(5)
Observations	1,635	975	1,050	1,230	1,155
R^2	0.598	0.616	0.617	0.622	0.614
Note:					*p<0.1; **p<0.05; ***p<0.01
					Standard errors in parentheses

Standard Errors reported in parentheses are hetero-skedastic robust. District and Time Fixed effects are included but not displayed.

Table 10: Effect of Merger on Transportation Spending by Year of Merger

	Dependent variable:				
	Transportation Spending per Pupil				
	(All)	(2017)	(2018)	(2019)	(2020)
Merge	166.142***	214.161**	370.321***	114.440*** 86.9	
	(26.744)	(89.710)	(56.951)	(39.405)	(47.434)
Constant	700.580***	692.289***	691.260***	699.723***	698.117***
	(71.885)	(83.486)	(81.398)	(78.224)	(79.290)
Dependent variable:	(1)	(2)	(3)	(4)	(5)
Observations	1,635	975	1,050	1,230	1155
R^2	0.519	0.518	0.517	0.529	.506
Note:					*p<0.1; **p<0.05; ***p<0.01
					Standard errors in parentheses

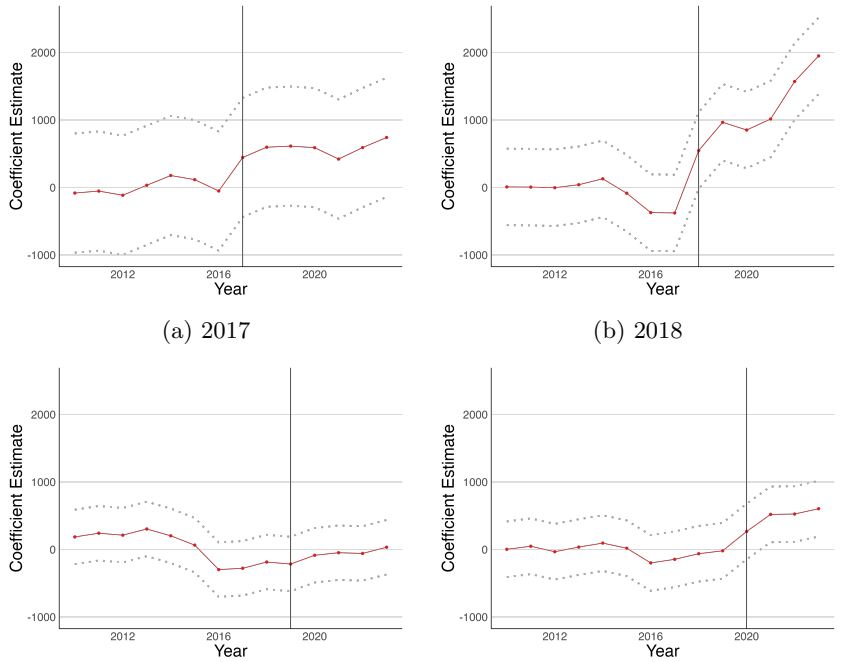
Standard Errors reported in parentheses are hetero-skedastic robust. District and Time Fixed effects are included but not displayed.

Table 11: Effect of Merger on Teacher and Student Support Spending by Year of Merger

	Dependent variable:				
	Teacher and Student Support Spending per Pupil				
	(All)	(2017)	(2018)	(2019)	(2020)
Merge	374.27***	568.03***	1,222.29***	-119.56	502.88***
	(154.23)	(152.43)	(109.13)	(80.07)	(47.434)
Constant	519.68***	524.67***	533.10***	529.42***	698.117***
	(154.23)	(83.486)	(155.98)	(158.95)	(144.76)
Dependent variable:	(1)	(2)	(3)	(4)	(5)
Observations	1,635	975	1,050	1,230	1155
R^2	0.687	0.744	0.695	.744	.722
Note:					*p<0.1; **p<0.05; ***p<0.01
					Standard errors in parentheses

Standard Errors reported in parentheses are hetero-skedastic robust. District and Time Fixed effects are included but not displayed.

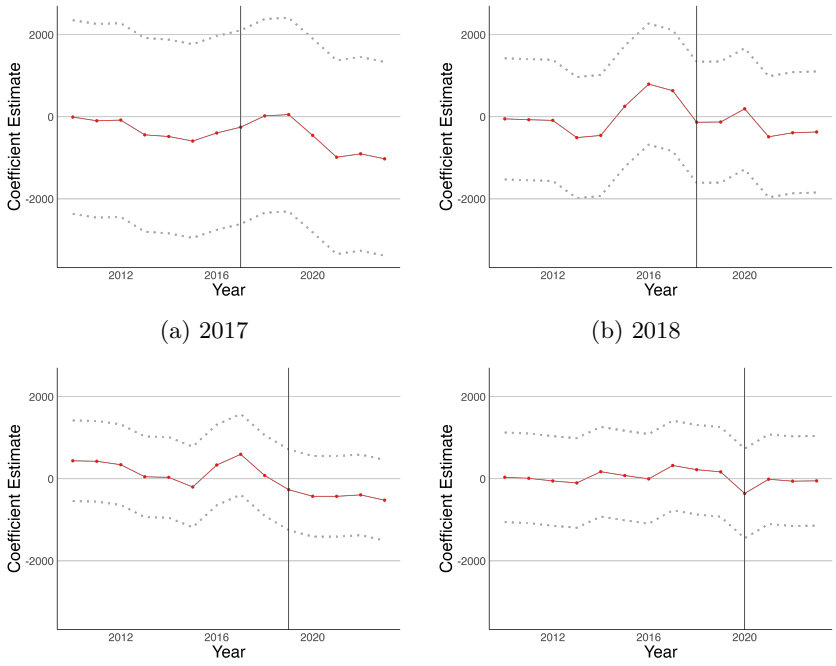
To visually capture these dynamics, Equation (2) was employed to create graphs (Figures 2-7) charting the coefficient on merging over time for the budget allocation categories significantly affected by the mergers. These graphical analyses not only confirm the parallel trends assumption—demonstrating that coefficients did not significantly deviate from zero in the pre-merger period—but also articulate the temporal effect of mergers on each budget category for different groups.



(a) 2017 (b) 2018

(c) 2019 (d) 2020

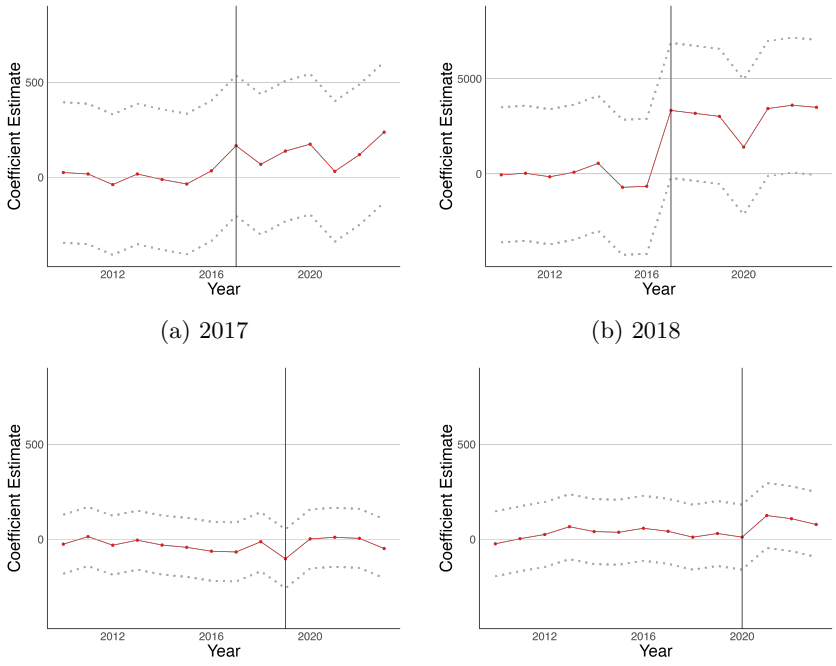
Figure 2: Teacher and Student Support Spending Dynamics following a Merger



(a) 2017 (b) 2018

(c) 2019 (d) 2020

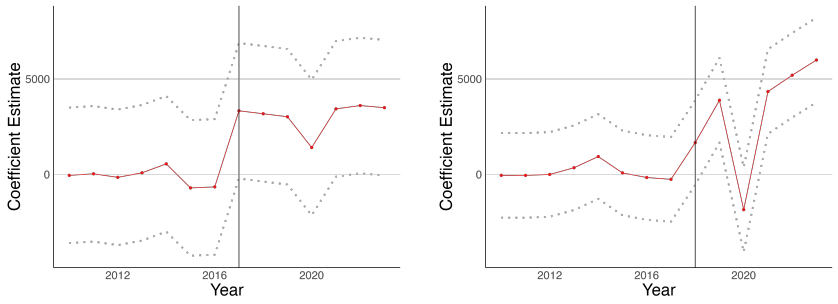
Figure 3: Admin Support Spending Dynamics following a Merger



(a) 2017 (b) 2018

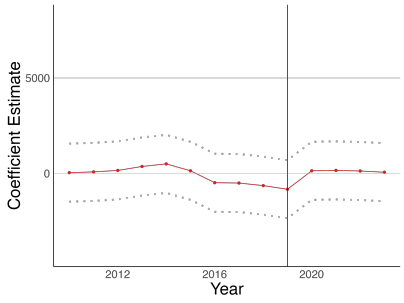
(c) 2019 (d) 2020

Figure 4: Material Spending Dynamics following a Merger

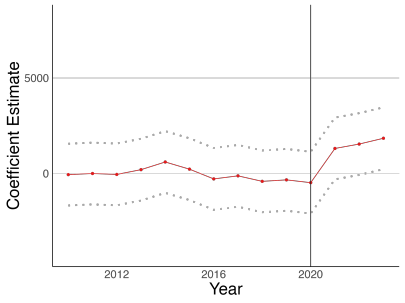


(a) 2017

(b) 2018

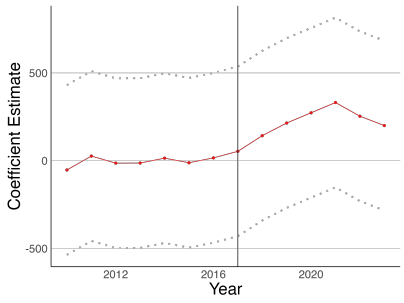


(c) 2019

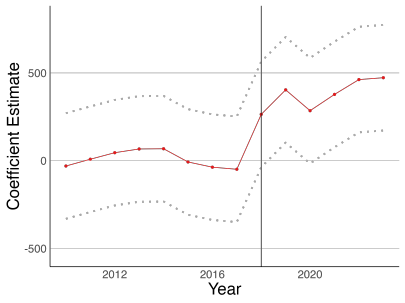


(d) 2020

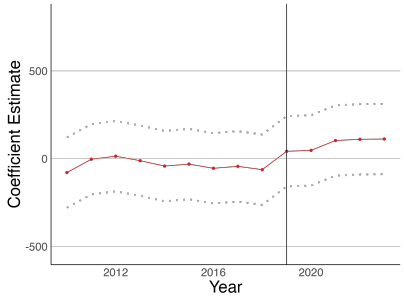
Figure 5: Salary and Benefit Spending Dynamics following a Merger



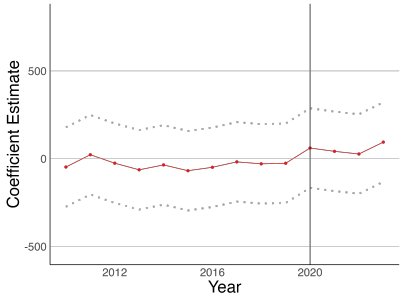
(a) 2017



(b) 2018

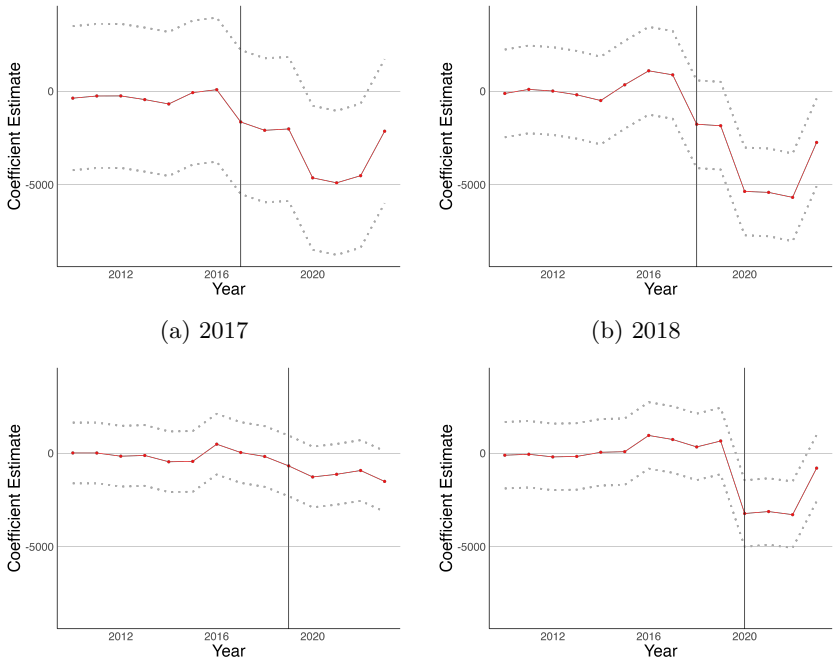


(c) 2019



(d) 2020

Figure 6: Transportation Spending Dynamics following a Merger



(a) 2017 (b) 2018

(c) 2019 (d) 2020

Figure 7: Services Spending Dynamics following a Merger

5.2 Interview Results

The outcomes of the email survey and interviews, summarized in Table 12, reflect a divided picture of the district merger process. Half of the administrators reported financial benefits for their districts following the mergers, while the other half saw no fiscal improvements. The half that saw fiscal improvements attributed these to net savings or financial support to what were smaller individual districts pre merger. A common concern among towns was the perceived loss of local control, although 61% of respondents noted that this concern diminished as the merger process advanced. Approximately 56% observed an increase in equity, with many administrators noting a shift in the rhetoric at school board meetings from individual school focus to district-wide considerations, thereby ensuring uniform access to curriculum's and materials. However, 44% reported no change in equity or cost savings, often attributing this to diseconomies of scale, where the logistical costs of transferring materials or personnel negated any financial savings. The reduced influence of individual districts under a merged board was another point of reflection, highlighting a decrease in personal connections and community ties.

The diversity of responses underscores not only the variability in the merger's effects across districts but also the importance of the initial approach to the merger process. One superintendent pointed to significant savings in their Supervisory Union, crediting a strategic search for partners with aligned values that facilitated effective budget streamlining. Similarly, a separate superintendent shared insights into their district's approach, emphasizing operational unity and equity, though acknowledging challenges in transitioning to a collective district identity amidst strong local control sentiments; "I think it depends on how the district approached it. We are a

Table 12: Perceived Benefits and Drawbacks from the Merger Process

Question	No	Common Reasons for No	Yes	Common Reasons for Yes
Did the merger provide financial benefits?	9	**spending additional dollars to maintain separate Central Offices, transporting shared services, budgets are no longer robust, diseconomies of scale**	9	**sharing of resources, able to hire full time personnel, unified curriculum and materials, lowered contracted services**
Was local control a concern in towns prior to merging?	18	**voters feared loss of school, community, and board power**	0	
Have attitudes shifted?	7	**still animosity between towns, voters see no evidence of merger benefits**	11	**schools didn't close, voters begrudgingly accept, voters believe it has been beneficial**
Has the merger created equity?	8	**merger didn't change anything, less board power and board relationships**	10	**increased community focus, better personnel and materials**
Do you support mergers?	3	**no direction or clarity from the state, excess costs, no evidence for merger benefits**	15	**small schools with large budgets aren't sustainable, helps struggling districts, saves money**

single pre K through 12 district, and there's equity between our school districts, and we're operating as one system. Other districts may have just decided that each building is still going to do their own thing, but that's not how we operate in our district. So I think it's been a huge cost savings." However, this superintendent also alluded to a more challenging transitory phase predicated on towns commitment to local control. "It's taken a while. I have a school board with three members from each of our towns. And initially they used to identify themselves as 'I'm so and so the board member from [town name].' Now, they're just [district name] board members. It's really about all of us collectively as a district and not about these individual towns, which is a little challenging when you look at our funding mechanisms and how property taxes are calculated based on the town in which you live." Among these observations, key benefits mentioned by superintendents included the spreading of special education and construction costs over a larger tax base, and the ability to hire necessary additional administrative and instructional personnel post merger; "The savings included improved programs. For example, instead of hiring multiple French teachers in each school, we hired a French teacher that was shared across schools. This example was the same with athletics, afterschool programs, and summer programs. Rather than have each individual school have separate programs, we were able to share resources which improved opportunities for students and saved money." Teachers weren't the only additional staff hired post merger. One superintendent noted that he was able to fill multiple roles that prior to merger fell solely on principals.

Conversely, 50% of administrators characterized the merger as a bureaucratic maneuver that failed to yield real financial or operational benefits. These administrators highlighted minimal cost savings and increased logistical expenses, casting doubt on the effectiveness of the mergers as a financial strategy. This sentiment was echoed in varied principal responses within the same district, illustrating the subjective nature of perceived merger benefits. I received two separate email responses from principals in the same unified school district. Responding to the question "Has the merger resulted in financial benefits for your district?" the first principal answered; "Yes! We are able to share resources and finances to help support all of our schools and student needs.". The second principal however responded "We have seen minimal gains in financial savings (buying bulk supplies) which were reallocated."

Despite these mixed views, there was general support for mergers as a policy tool, though opinions varied on the necessity of school closures or a state-driven process to achieve significant savings. One superintendent's comments underscored frustrations with Vermont's education financing system, pointing to disparities in resource allocation and the challenge of securing community support for school funding. The district merger process, as well as Vermont's state education financing formula, is rooted in local decision making. Yet, public education is funded through a statewide system. During our conversation they stated;

> We are one of the lowest spending school districts in the state. We have the fifth highest poverty in the state. And our students don't have adequate resources. And it's really because we can't pass a budget. We don't have community wide support for funding our schools. So should our students have less than

> others? I get we still need taxpayers to vote yes... the way act 127 is currently written, we in [District name] would be paying for [other high spending Districts] increases. So a disadvantaged district like ours, with high rates of poverty would be paying for [said district] to have more, because they're taking advantage of the caps, where our district could have added an additional $3 million. And we didn't because we wanted to make sure we were fiscally responsible. I struggle with the fact or the concept of a statewide education funding system that's voted on locally.[‡]

Not all feedback was supportive, with some administrators questioning the merger's ability to deliver substantial savings against the costs and complexities involved. The lack of comprehensive data and a unified policy direction contributed to skepticism about the initiative's efficacy. As opposed to the testimony above, other principal's emphasized the value of local governance, underscoring the benefits of close relationships and tailored decision-making at the district level.

> I don't disagree that trying to have a state funded system that is based on local decisions is a super hard thing to figure out. The one thing that comes to mind [however] is the relationship with school boards. If superintendents are asking a unified board to pass an $80 million budget for every school in the merged district, that's very different from me asking my board to pass a $17 million budget for our one school. I can explain everything to my nine members and I can do that relatively well. I have a relationship with the high school board; I know many of them just through growing up here. We rarely have contentious issues, but if there's something that is sort of on the surface, that might come up in a board meeting, I'd give them a heads up beforehand.

Overall, the interviews and survey responses reflect a broad spectrum of experiences and opinions on the district merger process in Vermont, highlighting both the potential and the challenges of seeking to streamline education administration and finance through consolidation.

6 Discussion & Conclusion

This paper examines the impact of both voluntary and mandated district mergers in Vermont on spending, budget allocations, tax rates, and perceptions of equity. The findings suggest that, overall, district mergers did not significantly influence total per-pupil spending, the growth rate of per-pupil spending, or tax rates. However, mergers did lead to a significant reallocation of expenditures, notably reducing spending on administrative support and contracted services in favor of increasing investments in salaries and benefits, teacher and student support, and materials, as well as transportation costs. These shifts align with prior cost-analysis predictions and administrative feedback, highlighting economies of scale through administrative consolidation and potential diseconomies in material and personnel reallocation.

The analysis further reveals a diversity in merger experiences and outcomes, not necessarily correlated with the year of merger, district size, income level, political composition, or spending growth rates. Depending on the first year of merger, merging had varying effects on budget allocations. Yet the units of observation in the 4

[‡]Since this conversation, the 5% tax cap has been removed

groups of the merger period do not vary significantly with district size, income level, or number of districts that merged. This variability suggests that the approach to the merger process, rather than structural characteristics, may influence outcomes.

The interviews and surveys also warn against using qualitative data alone to evaluate the success of the merger process, a technique the Vermont Agency of Education and legislature has been relying on thus far. Lack of consensus on the mergers ability to save money is indicative of the diverse amount of approaches Vermont districts had to mergers, but the discrepancy between two principals of the same district's description of merger savings indicates that qualitative data can not be driving legislative decisions. In addition, several administrators cited that "merging slowed the rate of increase in spending" or "absent mergers spending would have continued to rise more", but evidence from this study reveals this is not the case.

Qualitative insights were crucial for advising the quantitative analysis and interpreting results, despite the mixed responses about the mergers' success in achieving cost savings and educational goals. This study underscores a critical need for clearer articulation of the objectives behind district mergers, both in Vermont and elsewhere. The state's legislature and the AOE have yet to clearly define what constitutes equitable student outcomes, leading to implementation challenges and public dissatisfaction. One principal articulated the current lack of consensus that weakens policy effectiveness during their interview;

> What do we want to accomplish with our educational system? Do we want high SATs scores? Do we want high AP scores? Do we want kids to not drop out? Do we want them to be good citizens? Let's assume we don't just want high test scores, that we want some of this other stuff, too, then I think that's where the size conversation becomes very interesting. Because I can make a very strong argument that [school name], which graduates 10 to 18 students per year, does a really good job producing good citizens. What outcomes do we want? And how do we make sure those outcomes are equitably distributed?

The disparity in experiences and lack of consensus on the mergers' effectiveness calls for further research and a more explicit delineation of goals by policymakers, especially for state funded systems that value local control. Merging's effect on quantitative metrics of student achievement remains an avenue for future research in the context of Vermont. An integrated approach using both quantitative and qualitative data is necessary to fully grasp the implications of district mergers on financial efficiencies and educational equity. Future policy directions should be informed by a comprehensive understanding of these dynamics to ensure that district consolidations align with the broader objectives of the educational system and garner public support.

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