The Quest for Equity: An Examination of Weighted-Student Funding and Site-Based Budgeting in Tennessee

By

Angelique Nicole Crutchfield

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Approved:

Christopher A. Candelaria, Ph.D.
Jason A. Grissom, Ph.D.
Chezare A. Warren, Ph.D.
Alounso A. Gilzene, Ph.D.

To my inspiring and bright daughters to encourage you to dream big and never give up,

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Chapter 1

Introduction

In the landscape of American public education, the pursuit of equitable educational opportunities has long been a fundamental tenet. Ensuring that all students, regardless of their socioeconomic background, geographical location, or other student characteristics, have access to a high-quality education that fosters positive student outcomes remains a paramount goal. Equitable school funding is one means of promoting positive student outcomes (e.g., Jackson, 2020; Candelaria & Shores, 2019), yet intra-district funding is often inequitably distributed (Shores & Ejdemyr, 2017). This is particularly problematic in urban districts which tend to serve large proportions of students with higher educational needs, such as economically disadvantaged students and English language learners, who typically have poorer outcomes compared to more advantaged student subgroups (Miles & Roza, 2006; Stiefel, Rubenstein, & Berne, 1998).

To ensure more equitable opportunity for these students and improve student outcomes, many districts have adopted a decentralized funding approach known as student-based budgeting. This approach combines site-based budgeting with weighted-student funding, in order to achieve resource equity and outcomes-based equity (Ladd, 2008; Chambers et al., 2010; Malen, Dayhoff, Egan, & Croninger, 2017). The weighted student funding component of SBB accounts for the differential costs of educating different categories of students and provides students with the highest need a larger share of resources. The site-based budgeting component provides principals with greater budgetary flexibility to tailor school resources to student needs.

Through student-based budgeting, school leaders play an important role in determining the inputs necessary to produce more effective schools and more equitable education outcomes. SBB assumes that principals and other school-level professionals are better equipped to

understand students' educational needs and best know how to utilize resources to address those needs and improve student outcomes (Chambers et al., 2010; Annenberg Institute, 2002). For this approach to produce the desired output of improving student outcomes, school-level leaders have to understand the cost of educating different categories of students and be able to identify the services required for these students to be successful. Knowledge of these costs and services must also inform the district's allocation of school-level funds to ensure equity (Malen et al., 2017; Foley, 2010; Ladd, 2008).

This dissertation research examines the intricate relationship between SBB and educational equity, with a particular focus on the two largest urban school districts in Tennessee: Metro Nashville Public Schools (MNPS) and Memphis-Shelby County Schools (SCS). In this introductory chapter, I will begin with an overview of school finance in Tennessee to provide context and situate the two SBB districts. I will then take a more detailed look at school finance within MNPS and SCS. I will conclude with a brief overview of the three essays that will follow in this dissertation and that shed light on the relationship between SBB and equity in these two urban districts.

School Finance Methodologies in Tennessee

This section discusses the state-level and district-level resource distribution and school finance approaches in Tennessee. Tennessee introduced the Basic Education Program (BEP) in the early 1990s, which evolved into BEP 2.0 to better address varying student needs. To further the state's commitment to fostering equity in schools, the Tennessee Investment in Student Act (TISA) was signed in 2022, shifting the district funding model to focus more on individual student needs. Likewise, MNPS and SCS have adopted student-based budgeting to align resources with individual student requirements. These reforms signify a drive towards a more

equitable and student-centered education system.

State-Level Resource Distribution to Districts

Over recent decades, Tennessee has championed substantial educational changes with an emphasis on enhancing the quality, accessibility, and funding of education. In 1992, the state rolled out the Basic Education Program (BEP), aiming to standardize education funding throughout districts and guarantee every student had sufficient funding. This program uses a formula to allocate state education dollars based on factors like student enrollment, teacher salaries, and infrastructural requirements. It determines the expense of delivering fundamental education and splits this between state and local authorities, factoring in aspects such as local fiscal capabilities (Meyers, Valesky, & Hirth, 1995; GoldBaher & Callahan, 2001; Krause, 2010; Cohen-Vogel & Cohen-Vogel, 2001). In 2007, the BEP evolved into BEP 2.0, restructured to more effectively address school and student requirements. This update sought to improve the funding model to better represent the actual expense of educating students, considering elements like student counts and their varied needs (Krause, 2010).

In more recent years, Tennessee has continued to explore new ways to improve equitable resource distribution to schools. The state has made efforts to increase investments in education, in order to improve student outcomes and distribute resources more equitably among various school districts, regardless of size (GoldBaher & Callahan, 2001; Cohen-Vogel & Cohen-Vogel, 2001). The state is also implementing more responsive funding techniques, like the Tennessee Investment in Students Act (TISA), to better serve the needs of diverse student groups (Hahnel, Marchitello, & Ali, 2023).

The TISA Act was signed into law in 2022. This legislation signifies a significant shift in Tennessee's investment in public education, marking the first major overhaul to the funding

formula in over three decades. Under the TISA funding formula, Tennessee transitioned to a student-based funding model, committing an estimated $9 billion in education funding, including state and local contributions. This includes an additional recurring state investment of $1 billion, starting in the 2023-24 school year (Tennessee Department of Education, 2023).

The TISA public school funding formula aims to empower each student to achieve proficiency in reading by the third grade, equip high school graduates for success in postsecondary education, and provide necessary resources for all students to ensure their success (TDOE, 2023). TISA includes four key components: a base funding amount allocated to every public-school student; weighted funding to address specific student needs (e.g., low-income students, English learners, students with disabilities, those with characteristics of dyslexia, and students in small or remote communities); direct funding for key priorities like early literacy, career and technical education (CTE), and postsecondary readiness; and outcomes-based funding tied to student achievement. These key funding components are designed to help districts support all students in reaching their full potential (TDOE, 2023). TISA grants districts the autonomy to allocate funds in ways that best serve their local needs. With TISA, funding distribution to districts is based on the students they serve, granting districts the discretion to use funds in a manner that aligns with their unique requirements and educational priorities. This funding approach represents a significant step towards a more equitable and student-centered approach to education funding in Tennessee (TDOE, 2023).

District-Level Resource Distribution Methodologies

Traditionally, many of Tennessee's school districts have gravitated towards a centralized funding model (Bergfeld, Potts, & Mumpower, 2021). Under this model, the district's central office takes the reins, orchestrating the distribution of staff and resources among schools. This

method often sees districts using guides that mirror the BEP's approach, where staffing decisions are influenced by student enrollment numbers (Bergfeld, Potts, & Mumpower, 2021). For example, a district might assign a certain number of teaching assistants, specialists, or other staff to a school based on the number of students enrolled in the school. It is important to note that these guides are flexible and not prescriptive; they serve as a foundation that districts adapt based on the specific needs and circumstances of each school.

However, funding disparities persist, notably between affluent and less affluent districts, largely due to the pronounced impact of local funding. Districts with substantial property taxes can invest more in their schools, often resulting in resource and opportunity gaps (GoldBaher & Callahan, 2001; Cohen-Vogel & Cohen-Vogel, 2001; Klein, 2008). To combat these inequities, districts like MNPS and SCS have adopted customized resource allocation and budgeting approaches, like weighted-student funding or student-based budgeting (Jarmolowski, Aldeman, & Roza, 2022; Chang, 2018; Roza, Hagan, & Anderson, 2021).

Student-Based Budgeting Model

Driven by a desire to prioritize educational equity, both MNPS and SCS transitioned to a Student-Based Budgeting (SBB) model in recent years (Shelby County Schools, 2018; Metro Nashville Public Schools, 2023; Bergfeld, Potts, & Mumpower, 2021). Unlike traditional funding paradigms, SBB allocates funds based directly on individual student needs. This model hinges on a formula crafted collaboratively by district leaders and school principals. It assigns funding to schools predicated on the requirements of specific student populations—like students with disabilities, economically disadvantaged students, or English language learners. While the district retains control over certain budget activities, such as building maintenance, transportation, and administrative functions like security and technology services, a large

proportion of the district-level funding is directly allocated to schools (Bergfeld, Potts, & Mumpower, 2021).

Student-Based Budgeting in MNPS

Metro Nashville Public Schools (MNPS), situated in the state's capital and Tennessee's second-largest district, serves as an example of a district in a dynamic urban setting with diverse student needs. Approximately 70% of the student population is Black or Latino, approximately 35% is economically disadvantaged, and approximately 30% are English language learners (TDOE, 2023). MNPS, with its rich cultural diversity, has sought to provide students with more equitable opportunities for academic success.

MNPS began SBB districtwide in 2015-16 after a two-year pilot. SBB gave principals budgetary flexibility over approximately 50% of the district's budget (MNPS, 2023).The goal of SBB in MNPS was to distribute resources in alignment with student needs, inspire creative decisions, bolster accountability and transparency, and align central office support to school needs (MNPS, 2015). In the 2015-16 academic year, MNPS set a standard student weight of $4,250, with additional weights based on factors like grade level, prior performance, ELL status, and special education. MNPS has been continuously fine-tuning their allocations each year.

Student-Based Budgeting in SCS

Memphis-Shelby County Schools (SCS), located in the southwestern region of the state and the largest school district in Tennessee, represents a sprawling urban district with a predominantly black and economically disadvantaged student population. In SCS, over 70% of the student population is black and over 50% is economically disadvantaged (TDOE, 2023). SCS has grappled with longstanding disparities in educational outcomes, predominantly along socioeconomic lines, consistently serving the largest proportion of low-performing schools in

Tennessee. The district adopted student-based budgeting to help rectify student disparities and improve student outcomes.

SCS adopted a weighted-student funding (WSF) approach during the 2018-19 academic year. In its first year, SCS earmarked approximately 38% of its budget, totaling around $1 billion, for WSF to meet the unique needs of students, especially those encountering learning challenges (Kebede, 2020). The adoption of this funding approach in Memphis aimed to empower individual schools to make budgetary decisions aligned with their distinct requirements, thereby promoting equity and ensuring that all students have equitable access to essential resources (SCS, 2019). In its initial year of implementation, students received a base allocation of $3,400, with supplementary weights factored in for grade level, student performance, mobility, and special education. Mobility was utilized as a more nuanced indicator of poverty to provide a more accurate representation of students' needs. Additionally, in the 2019-20 academic year, SCS introduced an additional weight of 0.03 for English Language Learners (ELL) to account for potential discrepancies in measuring poverty (SCS, 2019). Similar to MNPS, Memphis-Shelby County Schools has continued to refine their weights and base allocation amount in each subsequent school year.

Exploring Resource and Outcomes-Based Equity in MNPS and SCS

The following chapters in this dissertation provide in-depth exploration of student-based budgeting, as a whole or in part, and how it effects or relates to resource equity and outcomes-based equity, particularly for historically underserved subgroups. In Chapter 2, I use a descriptive analysis and causal analysis to examine the effects of weighted-student funding on resource equity and outcome-based equity in MNPS and SCS. The descriptive analysis uses an exposure-based and slope-based progressivity measure to assess resource equity for historically

underserved student subgroups, particularly English language learners, economically disadvantaged students, and students with disabilities. The progressivity measure indicates whether disadvantaged students tend to be enrolled in schools with more, or less, funding relative to their non-disadvantaged comparison group (Chingos & Blagg, 2017). The causal analysis examines the effect of WSF on outcomes-based equity (achievement scores and graduation rates) over time in MNPS and SCS using an augmented synthetic control method.

In Chapter 3, I use a multiple case study methodology to explore how MNPS principals conceptualize equity and how this conceptualization influences their resource management and allocation process. I use an equity-focused organizational leadership framework developed by Ishimaru and Galloway (2014) to inform my analysis.

In Chapter 4, we use a mixed methods approach to examine how higher levels of funding affect student outcomes and how these effects vary by student subgroup using a comparative interrupted time series design. This paper is the first to use a causal analysis to examine the extent to which student outcomes are affected by varying dosage levels of student-based budgeting. We also use a qualitative analysis to explore potential mechanisms of student-based budgeting that may lead to improved student outcomes.

These essays provide insight into whether differential funding based on student characteristics, improves resource equity and outcomes-based equity for underserved student subgroups. Additionally, these findings can inform policy discussions around how to more efficiently and equitably align financial resources to students as well as provide insight into the role equity-focused resource management plays in strategic principal leadership. Findings will also inform policy regarding how much funding may be adequate to achieve desired student outcomes.

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Chapter 2

Weighted-Student Funding and Equity:

Does Differentiated Funding Lead to More Equitable Outcomes?

Introduction

District-level budget models in the United States often do not adequately consider the diverse needs of students. These models typically involve centralized resource allocation, in which school districts exercise a large amount of control over individual school budgets (Chang, 2018; Stiefel, Rubenstein, & Berne, 1998). In centralized resource allocation, district central offices allocate resources to schools in the form of predetermined staff and dollars provided for particular purposes, and school principals have little to no input (Chang, 2018; Odden & Picus, 2019; Stiefel, Rubenstein, & Berne, 1998). Intra-district per pupil spending can vary widely, which has been associated with increased educational inequities for disadvantaged and historically underserved students, such as lower achievement scores for economically disadvantaged and Limited English Proficient students (Houck, 2011; Iatorala & Stiefel, 2003; Owens & Maiden, 1999).

Weighted student funding (WSF) has been adopted in several urban districts across the United States to help increase equity between and within schools as well as remedy some of the perceived issues associated with more centralized budgeting (Miles & Roza, 2006; Miles, Ware, & Roza, 2003). WSF is a decentralized budgeting model that is designed to increase vertical equity. This approach takes into account the differential costs of educating different categories of

students and provides students with the highest need a larger share of resources (Ladd, 2008; Chambers, Levin, & Shambaugh, 2010; Malen, Dayhoff, Egan, & Croninger, 2017). Weighted student groups often include economically disadvantaged students, English Language Learners, and students with disabilities (Miles & Roza, 2006). Ideally, weighted student funding should lead to more equitable outcomes for disadvantaged students by helping ensure they have the resources needed to be successful.

Heterogeneity in the design and implementation of WSF across urban districts underscores the diverse approaches taken when tailoring the model to local needs, preferences, and contexts. Factors such as local political climates, socio-economic conditions, and the historical context of school funding in the district can all shape the specifics of WSF design and implementation (Miles & Roza, 2006). For instance, some districts might use WSF primarily to channel more funds to students with disabilities, while others might focus on economically disadvantaged students or English language learners (Edunomics Lab, 2020; Miles & Roza, 2006).

While there is substantial heterogeneity in how districts design and implement WSF (Edunomics Lab, 2020), this research can still provide useful insights into the utility and effectiveness of WSF, which can help other districts that are considering implementing a WSF model. Each WSF implementation, regardless of its design specifics, offers a unique case study on how resources can be allocated to address diverse student needs. Although the diverse nature of WSF implementations across districts can introduce complexities when evaluating its overarching success, it also broadens the scope of insights available. By examining various WSF models, we can discern patterns of success and identify potential pitfalls in the quest for achieving greater equity.

However, limited research exists regarding the extent to which weighted-student funding has achieved greater equity. Some studies have shown that WSF has led to improved resource equity in urban districts like Houston and Oakland, but other studies have shown limited effect on resource equity (Miles & Roza, 2006; Chambers et al., 2010; Baker, 2009). Similarly, research on WSF's effect on student outcomes is largely mixed or inconclusive (Hanushek, Link, and Woessmann, 2011; Derby & Roza, 2017; Stroub, 2018). While weighted-student funding holds promise for helping to solve some of the resource-driven inequities that plague many urban districts, the lack of evidence demonstrating this funding reforms efficacy in improving outcomes-based equity and resource equity may contribute to districts hesitancy in adopting this funding approach. Likewise, if this funding approach does not achieve the aims of improving equity, then districts who already utilize WSF will benefit from greater evidence showing where WSF may fall short so they can adjust accordingly.

This study seeks to contribute to the existing literature and WSF policy landscape by examining the effects of weighted-student funding on resource and outcome-based equity in two urban Tennessee districts, Metro Nashville Public Schools (MNPS) and Shelby County Schools (SCS), relative to other districts in Tennessee that did not implement WSF. I use both a descriptive and causal analysis to examine resource and outcomes-based equity. For the descriptive analysis, inter-district resource equity is measured using a method developed by Chingos and Blagg (2017), which computes funding progressivity for historically underserved subgroups of students, particularly economically disadvantaged students, English language learners, and students with disabilities. Progressivity of funding relates to the average funding for a higher need student subgroup (i.e., students with disabilities) relative to the average funding for students not in that subgroup (i.e, students without disabilities). For example, funding would be

considered progressive if the average student with a disability attends schools that are better funded than schools the average students without disabilities attends (Chingos & Blagg, 2017). The causal analysis uses an augmented synthetic control method to examine the causal effect of WSF on outcomes-based equity (achievement scores and graduation rates) over time in MNPS and SCS. The synthetic control method creates one weighted, average comparison group (synthetic control) for all other districts in the state, which closely approximates the treated groups' pre-treatment outcomes and covariates (Ben-Michael, Feller, & Rothstein, 2021). The augmented synthetic control method (ASCM) enhances the SCM approach by calculating a de-biased synthetic control mean for every outcome of interest in non-WSF districts, by adding a bias correction term.

This study will answer the following research questions:

1. *Intra-District Resource Equity*. Within WSF districts, how progressive is per pupil spending among schools? The student subgroups on whom I will assess progressivity include economically disadvantaged students, students with disabilities, and English language learners.
2. *Inter-District Resource Equity*. How progressive is per pupil spending among WSF districts in comparison to similar non-WSF districts in Tennessee?
3. *Outcomes-Based Equity*. What is the relationship between weighted-student funding and student outcomes, specifically graduation rates and test score proficiency rates?

For research question 1, I use NERD$ school-level finance data to examine whether disadvantaged sub-groups on average attend better funded schools than their non-disadvantaged comparison groups withing MNPS and SCS. This research question examines resource equity

within districts and provides evidence for whether WSF has increased intra-district resource equity.

For research question 2, I use NERD$ school-level finance data to compare WSF districts in Tennessee to five similar non-WSF districts in Tennessee. This research question examines resource equity between districts and provides evidence for whether WSF has increased inter-district resource equity. If WSF is working as designed, I expect that WSF districts will have more progressive funding than non-WSF districts. Due to only have four years of school-level fiscal data available, I am unable to conduct a causal analysis. However, a descriptive analysis will still provide useful information to district leaders and policymakers into whether WSF is generally performing as designed in regard to increasing resource equity. If not, the findings can provide support for further research into student weights and whether revisions to the funding formula would be warranted.

For research question 3, I use the augmented synthetic control method to examine the change in outcomes of the treated WSF districts compared to the change in outcomes of the weighted comparison group over time, similar to a difference-in-differences design. However, unlike the difference-in-differences model, weights are systematically assigned to the comparison group to create a better counterfactual comparison group (Abadie, Diamond, & Hainmueller, 2010).

Ultimately, this study seeks to examine whether providing differential funding based on student characteristics has led to the desired result of improved resource equity and more equitable student outcomes for underserved student subgroups. This study finds that within WSF districts, MNPS and SCS show progressive per pupil spending for economically disadvantaged students and students with disabilities, especially at the elementary level. However, ELL students

in both districts experience regressive spending trends. Comparatively, Knox County stands out for its progressive spending across all student subgroups among the non-WSF districts, while SCS ranks among the least progressive. In terms of the impact of WSF on student outcomes in MNPS and SCS compared to the five non-WSF comparison districts, no significant or consistent effects were observed. The relationship between WSF and student outcomes remains inconclusive in this study.

Weighted Student Funding Background

Weighted Student Funding (WSF) originated in the 1950s as a strategy to ensure equitable state aid distribution across public districts, adjusting funds based on unique student needs. Over the decades, WSF evolved to also address intra-district disparities, especially in urban areas with diverse student populations. However, despite its intentions, the implementation of WSF varies significantly across districts, leading to disparities in achieving equitable educational outcomes. While some studies suggest WSF leads to greater resource equity within districts, the overall research on its effectiveness remains inconclusive, emphasizing the need for further examination in diverse contexts.

Origin and Development of Weighted Student Funding

Weighted Student Funding (WSF) began in the 1950s as a method to allocate state aid to public school districts. Over time, its focus shifted to how these districts distribute funds to the individual public schools within their jurisdiction. This shift highlighted the disparities in resource availability, particularly in urban districts with high concentrations of diverse learners, necessitating a more equitable distribution of funds.

Weighted Student Funding (WSF) began in the 1950s as a means to promote equitable allocation of state aid and resources across local public districts. WSF was originally developed

to address the diverse needs across public school districts (Baker, 2009). WSF's approach involves allocating funds based on student characteristics to ensure each student's needs are met (Baker, 2009; Miles & Roza, 2006; Rubenstein, Schwartz, Stiefel, & Amor, 2007). This funding strategy seeks to address the range of educational needs within diverse student populations, with the underlying principle of attributing more weight to students who need more resources, ideally resulting in a more equitable distribution of resources (Ladd, 2008; Chambers, Levin, & Shambaugh, 2010; Miles & Roza, 2006).

In recent decades, WSF has evolved to address not only disparities between districts but also those within, prompting a shift in focus to district-level allocation to further the goal of equity (Baker, 2009; Miles & Roza, 2006; Rubenstein, Schwartz, Stiefel, & Amor, 2007; Berne & Stiefel, 1994). Urban districts, characterized by their often diverse student population with a wide range of educational needs, became the focus of WSF discussions (Miles & Roza, 2006; Stiefel, Rubenstein, & Berne, 1998). By acknowledging the differing costs associated with educating a variety of student demographics in urban settings, WSF played an important role in promoting equitable resource allocation strategies (Ladd, 2008; Chambers et al., 2010).

The emergence and refinement of WSF as a district-level allocation model represents a proactive approach to addressing multifaceted educational disparities, both between and within districts. It seeks to align financial resources with the needs of diverse student populations, in order to provide enhanced equity and inclusivity in educational settings (Baker, 2009; Miles & Roza, 2006). The focus on resolving disparities within urban districts signifies WSF's potential in transforming urban educational settings, marked by their pronounced diversity and inherent challenges (Miles & Roza, 2006; Stiefel et al.,1998). However, in order to better understand how

WSF promotes equity, it is important to explore the methodologies and strategies employed to actualize the equitable distribution principles inherent in WSF.

Implementation and Allocation Method of WSF

Within WSF districts, weighted formulas determine the allocation of funds and provide schools with allocations reflective of their specific student characteristics. This funding model often provides principals enhanced autonomy, allowing them to tailor resources more accurately to the unique needs of their schools, promoting greater intra-district equity.

In district-level weighted student funding, the district determines the funding formula. The formula typically includes a base weight for all students and student need weights for students with higher educational needs. Higher weighted categories commonly include English language learners, economically disadvantaged students, and special education students (Miles & Roza, 2006). Schools then receive a dollar allocation based on their school enrollment number and the district's WSF formula (Chang, 2018).

After districts allocate additional resources based on student needs, principals are often given greater budgetary flexibility to use those resources to meet the needs of their students. WSF operates under the assumption that principals and site-based planning teams have greater knowledge and understanding about the needs of students within their school (Hanushek, Link, and Woessmann, 2011). Ideally, this needs-based aid distribution to schools and school-level resource allocation by principals can help resolve some of the significant within district inequities that often exists between schools in a district (Baker, 2009; Miles, Ware, & Roza, 2003).

The increased autonomy entrusted to principals, based on their understanding of the unique needs within their schools, serves as a pivotal mechanism for operationalizing the ideals

of WSF and bridging the gaps between allocating resources and addressing actual student needs (Hanushek, Link, & Woessmann, 2011; Baker, 2009). While increased autonomy is often tied with WSF, we do not observe the extent to which principals have autonomy in this paper. As the next section explores equity and outcomes intrinsic to WSF models, the emphasis will be on exploring the implications of WSF, combined with principal budgetary flexibility, in various urban districts.

Examining Equity and Outcomes in WSF Districts

WSF aims to achieve vertical equity, prioritizing outcomes-based equity by adjusting resources based on distinct student needs. However, the implementation of WSF models varies significantly across districts, creating disparities in the pursuit of equitable educational outcomes and making the evaluation of its overall efficacy challenging.

Weighted student funding within schools represents vertical equity in which students with higher needs receive higher funding weights than students with lower needs. WSF is designed to increase equity through distribution of resources to schools based on student needs. Consequently, weighted student-funding focuses more on outcomes-based equity (Ladd, 2008). Equity in terms of equality of outcomes requires that all schools have adequate resources to accomplish similar educational outcomes for students (Berne & Stiefel, 1984; Berne & Stiefel, 1994; Ladd, 2008; Houck, 2011). If the student weights correctly account for the differential costs of educating different categories of students, then weighted student funding should increase equality of outcomes (Ladd, 2008).

However, substantial variation exists in how districts design their WSF model and weights chosen for students. Some districts, such as Prince George's County, distribute less than a quarter of their total budget through their WSF formula. While other districts, such as Orleans

Parish, deploy almost 90 percent of their total budget through their WSF formula (Edunomics, 2020). Most WSF districts, including MNPS and SCS, distribute between 30 and 50 percent of their funds via their WSF formula, with non-formula allocations ranging from central office related supports to allocations for exempted programs or schools (Edunomics, 2020). Additionally, base weights and student demographic weights vary widely across districts. Grade level weights are the most common weighted category, but variation exists regarding which grade level should receive the highest weight. Similarly, the majority of districts also include a weight for English Language Learners, but weights range from 10 percent to 70 percent (Edunomics, 2020).

Not surprising, given the significant variation in WSF models, limited research exists regarding the extent to which weighted student funding has achieved greater equity, especially for students with higher needs who ideally should benefit more from this funding approach compared to more traditional budgeting approaches (Baker, 2009). At a minimum, several studies have found that weighted student funding does lead to greater resource equity within districts.

Some researchers have found that WSF has led to greater resource equity within districts. In the Houston Independent School district and Cincinnati Public Schools, Miles and Roza (2006) found that weighted student funding increased resource equity among schools within each district, with more schools in both districts receiving allocations closer to the weighted average expenditure in the district after previously having significant spending disparities. In San Francisco and Oakland, Chambers et al. (2010) found that after implementation of weighted student funding, per pupil spending became more responsive to student poverty at certain schooling levels.

However, the degree to which WSF improved equity varies across studies. In part due to the varying share of funds that go through the WSF formula (Roza & Hill, 2004). In a comparison of Houston Independent School District and Cincinnati Public Schools to other urban districts in Texas and Ohio, Baker (2009) found that, regardless of whether a district used a student weighting formula, districts were able to focus resources on higher-need schools. His findings suggest that weighted student funding may not be a necessary precursor to equitable need-based resource distribution at the district level.

Similar to research linking weighted student funding to more equitable resource distribution, research linking weighted student funding to more equitable student outcomes is limited and inconclusive. On a broader level, research has shown that decentralizing decision-making and providing principals with more autonomy to make budgeting allocation decisions, like in the weighted student funding process, can positively benefit students and positively effect student outcomes (Hanushek, Link, & Woessmann, 2011). Derby and Roza (2017) found that in California student achievement scores on state assessments seemed to improve after the introduction of weighted student funding, but the improvements coincided with a new testing system adopted by California during the same period, so the link between weighted student funding and student achievement was less clear. In Edmonton, Seattle, and Houston, who each used a decentralized form of funding in which principals made resource allocation decisions, Ouchi (2006) found that decentralized districts had better overall student achievement and more effectively reduced achievement gaps compared to centralized districts where funding was more directly controlled at the district level. However, Stroub (2018) found no relationship between student achievement and narrowing of achievement gaps with decentralization in Houston Independent School district.

Prior studies have also examined the relationship between WSF and improved outcomes for underserved and disadvantaged subgroups. Derby and Roza (2017) did not find evidence that weighted student funding significantly decreased achievement gaps, but they did find evidence of improved test scores for socioeconomically disadvantaged students after implementation of weighted student funding. Stroub (2018) also did not find evidence that decentralization narrowed the racial or socioeconomic achievement gap in Houston. Additionally, there was no significant effect of decentralization by grade level or school size.

The broad spectrum of WSF models and weights applied across districts reflect different strategies to address localized needs and priorities (Edunomics, 2020). The existing research, while providing some insights into the potential benefits of WSF in terms of resource allocation and student outcomes, remains inconclusive and points towards the need for a more comprehensive understanding of WSF's impact on equity (Derby & Roza, 2017; Stroub, 2018). The studies suggest that WSF, albeit promising, is not a panacea and needs to be contextualized within broader educational frameworks to effectively address the persistent inequalities in education (Baker, 2009; Ouchi, 2006). Subsequent sections seek to contribute to this growing body of literature by examining resource equity and outcomes-based equity in two urban districts in Tennessee that have adopted a WSF funding model.

Study Context

The history of education in Tennessee and within Tennessee school districts is marked by ongoing efforts to establish and refine an equitable and adequate funding system using various strategies and formulas to address the diverse needs of students. The challenges of local disparities and differing needs across urban, suburban, and rural districts continue to shape discussions and reforms in education funding policy at the state and district level.

In the last few decades, Tennessee has undergone significant educational reforms, focused on improving education quality, access, and funding. Tennessee introduced the Basic Education Program (BEP) in 1992 as a new formula to fund K-12 education. The BEP was designed to equalize education funding across districts and ensure adequate funding for every student in the state. The program calculates the cost of providing basic education and divides it between the state and local governments, considering factors like local fiscal capacity (Meyers, Valesky, & Hirth, 1995; GoldBaher & Callahan, 2001; Krause, 2010; Cohen-Vogel & Cohen-Vogel, 2001). The BEP was revised to BEP 2.0 in 2007, intending to better address the needs of schools and students. The revision aimed to refine the funding formula to more accurately reflect the actual cost of educating a student, taking into account various factors, including the number of students and the diverse needs of those students (Krause; 2010).

In recent years, discussions and reforms have continued around education and school district funding in Tennessee. The state has made efforts to increase investments in education, focus on improving outcomes, and ensure equitable distribution of resources across diverse and differently-sized school districts (GoldBaher & Callahan, 2001; Cohen-Vogel & Cohen-Vogel, 2001). The state continues to explore various funding strategies, such as the Tennessee Investment in Students Act (TISA), to address the specific needs of different student populations efficiently (Hahnel, Marchitello, & Ali, 2023;).

Despite state efforts, disparities still exist between wealthy and less affluent districts due to the significant role local funding plays in school finances. Wealthier districts with a higher property tax base can contribute more local funds to their schools, often leading to disparities in resources and opportunities for students (GoldBaher & Callahan, 2001; Cohen-Vogel & Cohen-Vogel, 2001; Klein, 2008). To address these disparities and better address student needs, districts

have implemented more tailored resource allocation strategies, such as weighted-student funding (Jarmolowski, Aldeman, & Roza, 2022; Chang, 2018; Roza, Hagan, & Anderson, 2021).

Metropolitan Nasville Public Schools (MNPS), the second largest district in Tennessee, implemented WSF district-wide in the 2015-16 school year after a two-year pilot program that provided principals with greater budgetary flexibility but not additional weighted funds. WSF gave principals decision-making power over approximately 50% of the district's budget (MNPS, 2023). The goal of WSF in MNPS was to equitably distribute resources to better align with the diverse needs of its students, enable innovative resource allocation decision-making, encourage accountability, increase resource equity, promote school funding transparency, and align central office services to the needs of schools (MNPS, 2015). In school year 2015-16, as seen in Table 2-1, MNPS included a base weight of $4,250 for students as well as included weights for grade level, prior academic performance or poverty weight, ELL status, and special education. MNPS has continued to refine their base allocation and weights over recent school years.

Shelby County Schools (SCS), the largest district in Tennessee, adopted a weighted-student funding approach in the 2018-19 school year. In its first year, SCS allocated approximately 38% of its roughly $1 billion dollar budget to WSF to address individual needs of students more effectively, particularly those facing learning challenges (Kebede, 2020). Memphis adopted this funding approach with the intention of empowering school leaders to make budgetary decisions that align with the unique needs of their student population, fostering equity and ensuring all students have access to necessary resources (SCS, 2019). In its initial year, as seen in Figure 2-1, students had a base allocation of $3,400 with additional weights provided for grade level, student performance, mobility and special education. Mobility was used as a more nuanced proxy for poverty to provide a better indication of student need. In 2019-20,

SCS also added a .03 weight for ELL to offset potential inadequacies in the poverty measurement (SCS, 2019). Much like MNPS, the district has continued to refine their weights and base allocation amount each school year.

For this study, MNPS and SCS are compared to five other districts in Tennessee. These five comparison districts were selected based on size and demographic composition of students. The five selected comparison districts were among the largest and more demographically similar non-WSF districts in Tennessee. The comparison districts include Knox County, Rutherford County, Hamilton County, Clarksville-Montgomery County, and Sumner County.[1] As shown in Table 2-2, while SCS and MNPS range in size from approximately 102,000 to approximately 77,000, respectively, the comparison districts range in size from approximately 30,000 (Sumner) to approximately 59,000 (Knox). MNPS and SCS also have a large percentage of Black, Hispanic, and economically disadvantaged student compared to the non-WSF districts. However, Nashville and Memphis are significantly larger, both with a population of more than 600,000, compared the next largest city in the state, Knoxville with a population of less than 200,000. However, districts in the same state were chosen to offer a more consistent environment for analysis by mitigating the potential effects of state laws and policies as well as other contextual differences or confounding variables that could result from comparison districts in different geographic regions.

[1] Williamson County serves more students than Clarksville-Montgomery County and Sumner County. However, only approximately 3 percent of Williamson County's student population is economically disadvantaged, while the other comparison districts had at least 15 percent economically disadvantaged students. Given that this is one of the commonly weighted categories and a primary subgroup of interest in this paper, Williamson County was excluded as a comparison district.

Methodology

Data

To assess resource equity in research questions 1 and 2, the study uses Tennessee school-level fiscal data from NERD$ data archive and administrative school characteristic data from Tennessee Department of Education (TDOE) in fiscal years 2019-2022. To assess outcomes-based equity in research question 3, the study uses school-level school characteristic and outcome data from TDOE in fiscal years 2012-2022 and school characteristic data from Common Core of Data (CCD) Public school data.

For research questions 1 and 2, the analysis uses spending data from the NERD$ data archive for Tennessee in fiscal years 2019-2022 and publicly available Tennessee Department of Education (TDOE) administrative data. The NERD$ dataset provides school-level funding data which enables a descriptive analysis of WSF and resource equity within MNPS and SCS compared to the five largest and most demographically similar non-WSF districts in Tennessee, which, as discussed previously, include Knox County, Rutherford County, Hamilton County, Clarksville-Montgomery County, and Sumner County. The analysis uses the state and local per pupil total expenditure variable in the NERD$ dataset. The fiscal data is merged with administrative data provided by the TDOE for years 2019-2022. The administrative dataset includes school-level and district-level data on all public schools in Tennessee. The analysis for research questions 1 and 2 uses school-level demographic information, including number of economically disadvantaged students, number of students with disabilities, and number of English Language Learners.

For research question 3, the analysis uses publicly available TDOE administrative data and publicly available National Center for Education Statistics (NCES) Common Core of Data

(CCD) Public school data. The TDOE data includes school-level demographic characteristics (e.g. percent male or female; percent ELL; percent free and reduced-price lunch eligible; percent students with disabilities), high school graduation rates, and achievement rates, specifically percent proficient or advanced, for end-of-grade tests in grades 3-8 from fiscal years 2012-2022. Of note, achievement test data is not available in fiscal year 2016 and 2020, due to testing complications in 2016 and pandemic-related complications in 2020. As a result, other student outcome data in the form of high school graduation rates is incorporated. Graduation rates are used because they reflect academic achievement and student success in achieving academic prerequisites. Improving graduation rates can indicate an environment that is more effectively using resources to meet the educational needs of students.

The analysis examines these outcomes for economically disadvantaged students, students with disabilities, and ELL students, when possible. For ELL students, the analysis will begin in fiscal year 2013 because they were not defined as a subgroup in publicly available TDOE data prior to that year. The CCD data includes additional school-characteristic data, such as indicators for charter schools, magnet schools, grade levels, locale, and type of schools. The analysis excludes charter schools and alternative schools, and the sample is limited to only schools that were present in all analysis years.

Analytic Plan

This section discusses the analytic plan to assess resource equity and outcomes-based equity in MNPS and SCS after weighted-student funding implementation. To explore intra-district resource equity in SCS and MNPS, an exposure-based progressivity measure is used to examine whether disadvantaged subgroups (i.e., economically disadvantaged students, English Language Learners, and students with disabilities) attend schools with higher or lower per pupil

expenditures, on average, relative to their non-disadvantaged peers. To explore inter-district resource equity, the progressivity measure is used to compare spending patterns between WSF districts and similar non-WSF districts in Tennessee, highlighting disparities or similarities across different districts. To explore outcomes-based equity, the Ridge Augmented Synthetic Control Method (ASCM) is used to evaluate the impact of WSF on student outcomes in MNPS and SCS, comparing schools in these WSF districts with a de-biased synthetic control mean of schools in the five non-WSF comparison districts.

Examining Resource Equity through Progressivity

The exposure-based and slope-based progressivity measures I use provide a means for evaluating school-level finance data and contrasting funding allocations between weighted and non-weighted student subgroups between and within districts (Chingos and Blagg, 2017, Jang & DiSalvo, 2023). These measures highlight the association between WSF and funding equity for historically disadvantaged student subgroups in comparison to their non-disadvantaged counterparts, offering insights into the practical efficacy of WSF in improving intra-district and inter-district resource equity.

Exposure-based progressivity measures the difference in school spending between the average disadvantaged and non-disadvantaged student's school (Jang & DiSalvo, 2022). Slope-based progressivity measures how much more disadvantaged student subgroups receive as their proportion within schools increases and involves quantifying the linear relationship between per pupil expenditures and the proportion of disadvantaged student subgroups in schools. While the exposure-based measure examines the average spending experienced by different subgroups, the slope-based measure assesses the relationship between per pupil spending and the proportion of

specific subgroups. By including both, I seek to provide a more holistic picture of funding progressivity.

I use these progressivity measures to assess resource equity within MNPS and SCS as well as resource equity across WSF and non-WSF districts. The progressivity measures for each district quantify the difference between school spending for economically disadvantaged and non-economically disadvantaged students; students with disabilities and students without disabilities; and ELL students and non-ELL students. The measures indicate whether students in the disadvantaged subgroups tend to be enrolled in schools with more, or less, expenditures compared to their non-disadvantaged comparison group (Chingos & Blagg, 2017). The Chingos and Blagg (2017) approach provides a direct comparison of funding between disadvantaged relative to non-disadvantaged subgroups, which adheres to how WSF is designed. A positive difference suggests the distribution of school funding is progressive.

Examining school-level finance data allows for the exploration of how WSF influences intra-district resource equity, a task that, until recently, has been challenging due to the lack of available school-level finance data. Before the availability of school-level finance data, one could only assess inter-district equity at the state level, which masks any variation in funding equity across schools within districts. In this paper, I calculate funding progressivity at the district-level, leveraging variation across schools, by school tier—elementary, middle, and high school—and overall by district in order to capture variations between schools that might be masked by only examining the state-level progressivity.

Under WSF, disadvantaged students should receive a higher share of resources than non-disadvantaged students, but this may not always translate in practice. Disadvantaged students may on average attend a school where there is overall a lower per pupil spending level relative to

schools the average non-disadvantaged student attends. While WSF may make a district more progressive overall relative to non-WSF districts, the district may still be underspending for its most disadvantaged schools relative to non-disadvantaged schools. Additionally, since principals may look at their overall school funding and allocate it more holistically to meet student need, exploring whether disadvantaged students tend to attend better resourced schools in comparison to non-disadvantaged students is an important equity consideration.

Intra-District Resource Equity

Research Question 1: Within WSF districts, how progressive is per pupil spending among schools? The student subgroups on whom I will assess progressivity include economically disadvantaged students, students with disabilities, and English language learners.

Research question 1 descriptively explores how progressive per pupil spending is within SCS and MNPS separately by using the slope-based and exposure-based progressivity measures discussed above. These measures are used to examine equity and spending patterns between weighted student subgroups and students who are not part of the subgroup.

For the slope-based metric, I use the state and local per pupil expenditure variable from the NERD$ dataset to conduct a simple linear regression analysis that describes the correlation between per pupil spending and the proportion of three weighted-student funding groups: economically disadvantaged students, English language learners, and students with disabilities. The objective is to determine if there is a higher allocation of funding to schools with a greater representation of economically disadvantaged, ELL, or students with disabilities. I calculate this relationship individually for each fiscal year from 2019 to 2022.

Similarly, for each district, the exposure-based equity metric uses the state and local per pupil expenditure variable to calculate a weighted average of each school's per pupil spending,

with weights determined by number of economically disadvantaged students, number of students with disabilities, and number of English Language Learners. The analysis then calculates a similar weighted average of each school's per pupil spending with weights determined by number of non-economically disadvantaged students, number of students without disabilities, and number of students who are not English Language Learners (ELL). A positive spending difference indicates that the spending is progressive (e.g., ELL students attend schools with higher per pupil spending, on average, than non-ELL students). The progressivity measure is calculated at the tier level and overall by district for each year of analysis, fiscal years 2019 to 2022.

$$\frac{1}{N_{Total}^{G=1}}\sum_{s=1}^{S}(RevPupil_s \cdot N_s^{G=1}) - \frac{1}{N_{Total}^{G=0}}\sum_{s=1}^{S}(RevPupil_s \cdot N_s^{G=0}). \quad (1)$$

Equation (1) represents the formula used for exposure-based progressivity. In equation (1), $RevPupil_s$ is per pupil revenue at school s; $N_s^{G=1}$ and $N_s^{G=0}$ are the proportions of students in group 1 (e.g., ELL students) and group 0 (e.g., non-ELL students) in school s; and $N_{Total}^{G=1}$ and $N_{Total}^{G=0}$ are the total number of students in group 1 and group 0 in the district.

Inter-District Resource Equity

How progressive is per pupil spending among WSF districts in comparison to similar non-WSF districts in Tennessee?

For research question 2, the exposure-based progressivity measure is used to examine spending progressivity in SCS and MNPS compared to similar non-WSF schools. Following the analysis exploring intra-district equity, spending progressivity is calculated for ELL students, economically disadvantaged students, and students with disabilities across schools in MNPS, SCS, Knox County, Rutherford County, Hamilton County, Montgomery County, and Sumner

County using state and local per pupil expenditures. Like research question 1, the progressivity measure is calculated at the tier level and overall, by district for each year of analysis, fiscal years 2019 to 2022. Per pupil progressivity differences are compared across districts for each fiscal year. Per pupil progressivity is plotted using a line for each district across all fiscal years.

Examining Outcomes-Based Equity through ASCM

Research Question 3: What is the relationship between weighted-student funding and student outcomes?

The Augmented Synthetic Control Method (ASCM) provides a more refined comparison of WSF and non-WSF districts by computing a de-biased synthetic control mean for each student outcome of interest. Essentially, the method creates a "synthetic control" group from a weighted combination of potential control units that best approximate the characteristics of the treated unit before the intervention (or treatment) occurs. This synthetic control then serves as a counterfactual, allowing me to infer the treatment effect by comparing the treated unit's post-treatment outcomes with the synthetic control's outcomes. ASCM enhances the traditional synthetic control method by using an outcome model to estimate potential bias inherent in SCM and then de-biases the original SCM, helping to ensure estimates aren't skewed by historical trends or patterns (Ben-Micheal, Feller, & Rothstein, 2021). This approach enables a more precise evaluation of WSF's effectiveness in promoting educational equity in student outcomes.

Research question 3 examines the extent to which student outcomes changed post-WSF implementation. The analysis uses the augmented synthetic control method (ASCM) to estimate the effects of WSF implementation on student outcomes for each WSF district. The student outcomes of interest include combined proficient and advanced test score rates and graduation rates. The analysis uses schools in the five other non-treated districts (i.e., Knox County,

Rutherford County, Hamilton County, Clarksville-Montgomery County, and Sumner County) in the sample to systematically construct a comparison group, also known as a synthetic control for each school in MNPS or SCS. The traditional synthetic control method (SCM) calculates a synthetic control mean for each outcome of interest in non-WSF districts in the sample by assigning differing time-invariant weights to schools in non-WSF districts based on matches prior to WSF implementation in SCS and MNPS. The ASCM method goes a step further by computing a synthetic control mean for each outcome of interest among the schools in non-WSF districts that is de-biased through the addition of a bias correction term. The analysis model also includes student demographic covariate adjustments to improve match quality.

The analysis uses R's *augsynth* command developed by Ben-Michael (2020) to estimate the ridge ASCM models. The average and dynamic ATT effects of WSF on student outcomes, including test score rates and graduation rates, are estimated using separate ridge ASCM models for each treated district and each outcome of interest. A row-based jackknife method is then used to estimate standard errors, allowing for autocorrelation within districts (Shores, Candelaria, and Kabourek, 2023) because this method does not make parametric assumptions about the population and only uses sample data.

Results

RQ 1. Intra-District Resource Equity. Within WSF districts, how progressive is per pupil spending among schools?

In this section, I report results for research question 1 and assess intra-district equity in MNPS and SCS. Overall, in both MNPS and SCS, state and local per pupil spending is progressive for economically disadvantaged students and students with disabilities, with the elementary tier often having the most progressive spending for these subgroups. However, in

both districts ELL students appear to be attending schools with increasingly regressive per pupil spending.

Intra-District Equity in MNPS

Across all fiscal years, spending is progressive for economically disadvantaged students and students with disabilities when using a slope-based progressivity measure. Since 2019, the allocation of state and local per pupil expenditures has become more progressive over time for economically disadvantaged students. Figure 2-1 shows the relationship between per pupil spending and percent of students economically disadvantaged. The graph displays FY 2019 through FY 2022. For each year, the size of the dots reflects total enrollment in each school as provided by the TDOE administrative dataset. The graph also shows a regression line through the data to quantify the relationship between per pupil spending and percent economically disadvantaged. The regression is weighted by total school enrollment in each school. For FY 2019, a 10-percentage point increase in economic disadvantage is associated with a $272.00 increase in state and local per pupil spending, on average. In FY 2022, this relationship increased such that a 10-percentage point increase in economic disadvantage is associated with a $316.00 increase in state and local per pupil spending. The results suggest an overall progressive allocation in per pupil expenditures for economically disadvantaged students, particularly within elementary schools.

In Figure 2-2, which uses the exposure-based progressivity measure, the marker labels reflect percentages of average per pupil state and local expenditures per student. The $368 difference in FY 2019, for example, represents 3.3% of average spending per student. This label helps to anchor the value relative to average state and local per pupil expenditures in the given fiscal year. Across all school tiers, the average economically disadvantaged student received

approximately $368 more than the average non- economically disadvantaged student in FY 2019. This difference increased slightly to $379 in FY 2022, indicating slightly greater resource progressivity. However, for FY 2020 and 2021, the amount decreased slightly to $357 and $351, respectively. Additionally, elementary schools appear to have the most progressive per pupil spending for economically disadvantaged students ranging from a spending difference of $430 in FY 2019 to $497 in FY 2022, followed by middle schools and high schools. While high schools have the lowest progressivity, ranging from a spending difference of $194 in FY 2019 to $168 in FY2022, all tier levels have progressive state and local expenditure spending with economically disadvantaged students attending schools with higher state and local per pupil spending compared to non-economically disadvantaged students, on average.

In contrast to the findings observed with economically disadvantaged students and spending, the findings suggest a concerning trend for ELL students in MNPS, where the relationship between the percentage of ELL students and state and local per pupil expenditures is not only slightly negative but also appears to be declining over time. Figure 2-3 shows the relationship between percentage of ELL students and state and local per pupil expenditures. The relationship between percentage ELL students and spending is slightly negative in MNPS in FY 2020 through FY 2022, and the relationship between percentage ELL students and state and local funding appears to be getting worse over time, on average. In FY 2019, a 10-percentage point increase in ELL students is associated with a $26.00 increase in per pupil spending. However, in FY 2022, the relationship indicates a 10-percentage point increase is associated with a $101 decrease in state and local spending.

When looking at spending by tier levels, the regressive spending becomes more evident, with all tier levels in the three most recent fiscal years showing decreased spending for ELL students relative to non-ELL students. Figure 2-4 shows that the average difference in spending between ELLs and non-ELLs is regressive in FY 2019 to FY 2022, with ELL students across all tiers attending schools with approximately $200 less in state and local per pupil expenditures, on average, in FY 2022. The spending is most regressive among elementary schools with ELL students attending elementary schools with approximately $563 less in state and local expenditures in FY 2022, on average, compared to non-ELL students. Though still regressive at the middle school level, spending progressivity has remained relatively stable and improved slightly from less than $317 in FY 2021 to less than $253 in FY 2022, while it became more regressive between FY 2021 and FY 2022 for ELL students compared to non-ELL students at the elementary and middle school level, on average.

Unlike spending on ELL students, state and local per pupil expenditures for students with disabilities became more progressive between FY 2019 and 2021, as shown in Figure 2-5. The progressivity declined slightly between FY 2021 and FY 2022 but still remained more progressive than the initial FY 2019. For FY 2019, a 10-percentage point increase in students with disabilities is associated with a $857.00 increase in state and local per pupil spending, on average. In FY 2022, this relationship increased such that a 10-percentage point increase in students with disabilities is associated with a $1164.00 increase in state and local per pupil spending.

Tier level analysis shows that all tiers are driving the progressivity trend noted in Figure 2-5. Figure 2-6 shows that the average difference in spending between students with disabilities and students without disabilities is progressive in all four fiscal years, with students with

disabilities across all tiers attending schools with approximately $221 more in state and local per pupil expenditures, on average, in FY 2022. The spending is slightly more progressive among elementary schools with students with disabilities attending elementary schools with approximately $291 more in state and local expenditures, on average, in FY 2022 compared to students without disabilities.

Intra-district Resource Equity: SCS

Unlike MNPS, state and local per pupil expenditures in SCS have become less progressive over time for economically disadvantaged students, but spending is still overall progressive like MNPS. Figure 2-7 shows the relationship between per pupil spending and percent of students economically disadvantaged. For FY 2019, a 10-percentage point increase in economic disadvantage is associated with a $156 increase in per pupil spending, on average. In FY 2022, this relationship decreased such that a 10-percentage point increase in economic disadvantage is associated with a $51 increase in state and local per pupil spending.

Across all school tiers, the average economically disadvantaged student received approximately $227 more than the average non-economically disadvantaged student in FY 2019. This difference decreased to $65 in FY 2022, indicating less spending progressivity. Elementary schools appear to have the most progressive spending for economically disadvantaged students in recent fiscal years, ranging from a spending difference of $145 in FY 2021 to $123 in FY 2022. High schools have the lowest progressivity, ranging from a difference of $32 in FY 2021 to a regressive difference of $26 in FY2022.

Funding for ELL students compared to non-ELL students appears to be regressing, moving from progressive per pupil spending in FY 2019 to regressive spending in FY 2022. Figure 2-9 shows the relationship between percentage of ELL students and state and local per pupil

expenditures. Similar to MNPS, the overall funding for ELL students compared to non-ELL students is regressive. Also, similar to MNPS, the relationship between percentage ELL students and state and local funding appears to be getting worse, on average, in FY 2020 and FY 2021. In FY 2019, a 10-percentage point increase in ELL students is associated with a $127 increase in per pupil spending. However, in FY 2022, the relationship indicates a 10-percentage point increase is associated with a slightly regressive $6 decrease in state and local funds.

Although ELL spending appears to be regressive overall in SCS, tier level analyses show that spending at the elementary school level is progressive unlike the middle school and high school tiers. Figure 2-10 shows that the average difference in funding between ELLs and non-ELLs across all tiers is regressive in the most recent fiscal years, with ELL students across all tiers attending schools with approximately $10 less in state and local per pupil expenditure funding, on average, in FY 2022. The elementary school tier has the only fiscal years with progressive funding at the tier level with ELL students attending elementary schools with approximately $185 more in state and local per pupil expenditure funding in FY 2019 and $182 more in FY 2022, on average. The funding is most regressive among high schools with ELL students attending high schools with approximately $112 less in state and local expenditure funding in FY 2022, on average, compared to non-ELL students.

Unlike ELL spending, per pupil state and local expenditures for students with disabilities compared to students without disabilities is progressive across all years but declining each year in SCS. The state and local per pupil expenditures for students with disabilities has become less progressive between FY 2019 and 2022, as shown in Figure 2-11. For FY 2019, a 10-percentage point increase in students with disabilities is associated with a $387 increase in state and local per pupil spending, on average. In FY 2022, this relationship decreased such that a 10-percentage

point increase in students with disabilities is associated with a $101 increase in state and local per pupil spending.

Although spending for students with disabilities is overall progressive, the decline in progressivity for students with disabilities compared to students without disabilities in SCS appears to be driven by the high school tier which has had increasingly more regressive funding in each fiscal year. Figure 2-12 shows that the average difference in spending between students with disabilities and students without disabilities is progressive across all tiers, with students with disabilities attending schools with approximately $48 more in state and local per pupil spending, on average, in FY 2019 and approximately $17 more in state and local per pupil spending, on average, in FY 2022. The spending is most progressive among elementary schools with students with disabilities attending elementary schools with approximately $84 more in state and local expenditure funding, on average, in FY 2022 compared to students without disabilities. High schools, however, have increasingly regressive funding with schools spending less than approximately $100, on average, in FY 2022 for students with disabilities compared to students without disabilities in SCS.

RQ 2. Inter-District Resource Equity. How progressive is per pupil spending among WSF districts in comparison to similar non-WSF districts in Tennessee?

In this section, I report results for research question 2 and assess inter-district equity in MNPS and SCS relative to the five non-WSF comparison districts. In an exploration of state and local expenditures from 2019 to 2022, Knox County stands out as the most progressive district across all school tiers in terms of spending for economically disadvantaged students, ELL students, and students with disabilities. In contrast, MNPS demonstrated varying levels of progressivity, being the second most progressive district overall in some aspects but displaying

regressive spending trends for ELL students, while SCS generally ranks among the least progressive districts across all tiers and for all subgroups.

Knox County has the most progressive spending for economically disadvantaged students compared to non-economically disadvantaged students across all districts and all tiers in the sample. As seen in Figure 2-13, across all school tiers in Knox County, the average economically disadvantaged student attended schools with approximately $770 more in state and local expenditures than the average non-economically disadvantaged students in FY 2019 and approximately $842 more than the average non-ED students in FY 2022, with elementary and high school tiers being the most progressive in Knox County. MNPS was the second most progressive district overall across all tiers with a spending difference range of $368 in FY 2019 to $379 in FY 2022. SCS was among the least progressive districts with economically disadvantaged students attending schools with $65 more in state and local expenditures, on average, in FY 2022 with only Sumner being less progressive with a difference in spending of $57 in FY 2022.

Knox County is also the most progressive district in the sample for ELL students compared to non-ELL students across all tier levels and all study districts. As seen in Figure 2-14, across all school tiers in Knox County, the average ELL student attended schools with approximately $567 more in state and local expenditures than the average non-ELL students in FY 2019 and approximately $495 more than the average non-ELL students in FY 2022, with middle and high school tiers being the most progressive in Knox County. MNPS was the least progressive district overall across all tiers with a spending difference range of $46 in FY 2019 to a regressive difference of $230 in FY 2022. SCS, while not the least progressive district, was still

in the bottom half of districts across all tier levels with a progressive spending difference of $145 in FY 2019 and a regressive difference of $10 in FY 2022.

Similar to progressivity for economically disadvantaged students and ELL students, Knox County was also the most progressive across all tiers, on average, for students with disabilities compared to the other districts in the sample. As seen in Figure 2-15, Knox County has the most progressive spending for students with disabilities compared to students without disabilities across all districts and all tiers in the sample. Across all school tiers in Knox County, the average student with disabilities attended schools with approximately $197 more spending than the average student without disabilities in FY 2019 and approximately $226 more than the average student without disabilities in FY 2022, with high school and middle school tiers being the most progressive in Knox County. MNPS was again the second most progressive district overall across all tiers with a range of $145 in FY 2019 to $221 in FY 2022. However, MNPS was the most progressive district at the elementary school tier level in all four fiscal years and the most progressive at the middle school level in FY 2021. SCS was again among the least progressive districts with students with disabilities attending schools with $16 more in state and local expenditures, on average, in FY 2022. In that fiscal year, no other district was less progressive.

RQ 3. Outcomes-Based Equity. What is the relationship between weighted-student funding and student outcomes?

This section evaluates the impact of WSF implementation on graduation and math and RLA proficiency rates in MNPS and SCS, comparing them with five non-WSF comparison districts in the main analysis. In both districts, the introduction of WSF did not produce consistent or pronounced effects on any student group's rates. Despite some observed trends,

none of the effect estimates reached statistical significance against the five comparison districts. Other specification models using statewide school-level and district-level data also did not reach statistical significance. Consequently, the exact influence of WSF on outcomes-based equity remains inconclusive in this study.

Outcomes-Based Equity in MNPS

The ridge ASCM effect estimates provide insight into the impact of WSF on MNPS graduation, math proficiency, and RLA proficiency rates for economically disadvantaged students, ELL students, students with disabilities, and across all students. For both graduation and proficiency rates, the data reveals fluctuating trends and no consistently positive impact post WSF implementation across the groups. Furthermore, due to the uncertainty in effect estimates and lack of statistical significance, we could not draw definitive causal conclusions about WSF's influence on these educational outcomes in MNPS.

Figure 2-16 shows ridge ASCM effect estimates of WSF on MNPS graduation rates from FY 2012 to FY 2022 for four groups of students: economically disadvantaged students (ED, blue line), students with disabilities (SWD, red line), English Language Learners (ELL, green line), and all students (All, orange line). The Figure 2-shows differences between graduation rates in schools in MNPS and a de-biased synthetic control mean of graduation rates in comparison schools in the non-WSF districts using the ridge augmented synthetic control method. The horizontal line at zero indicates that there is no difference between the treated (WSF) district and the augmented synthetic control non-WSF comparison districts. The difference in graduation rates between the comparison schools in the non-WSF districts and the treated schools in the WSF district should be close to zero in the years prior to WSF implementation if each comparison group sufficiently resembles characteristics and trends of the treated district. The

vertical dashed line represents the first fiscal year WSF treatment began districtwide, FY 2016, in MNPS.

The trend lines for all groups fluctuate throughout the fiscal years post WSF implementation. The graduation rate trend lines for economically disadvantaged (ED) students and all students deviate the least among MNPS schools compared to schools in the five non-WSF comparison districts. While the graduation rates for ELL students and students with disabilities (SWD) in MNPS schools improved relative to non-WSF comparison schools after MNPS implemented WSF, the improvements in ELL and SWD graduation rates did not lead to consistently positive trend lines. The effect estimates are trending down in the most recent fiscal years, FY 2021 and 2022, for ELL students and trending up slightly in the most recent year, FY 2022, for SWD, after consistent fluctuation up and down for SWD.

There is uncertainty around these effect estimates, especially for ELL students. While the other confidence bands are not as wide, none of the effect estimates are significant, indicating that we are unable to draw causal conclusions about WSF's precise impact on graduation rates in MNPS. The introduction of WSF does not appear to have a pronounced or consistent impact on any specific group.

Figure 2-17 shows ridge ASCM effect estimates of WSF on MNPS math and RLA proficiency rates from FY 2013 to FY 2022 for four groups of students: economically disadvantaged students (ED, blue line), students with disabilities (SWD, red line), English Language Learners (ELL, green line), and all students (All, orange line). The lines for each group show differences between math (Figure 2-17a) and RLA (Figure 2-17b) proficiency rates in schools in MNPS and a de-biased synthetic control mean of math and RLA proficiency rates

in comparison schools in the non-WSF districts using the ridge augmented synthetic control method.

Similar to graduation rates, math and RLA proficiency rates did not demonstrate a consistently positive difference between MNPS and the five comparison districts post WSF implementation. Figure 2-17a shows that ridge ASCM effect estimates of WSF on math proficiency rates for ED and all students in MNPS appear to be negative in comparison to schools among the five non-WSF districts. For ED students, WSF had a negative, statistically significant impact in Math proficiency in FY 2021. ELL students and SWD students have a slightly positive difference among schools in MNPS in comparison to schools in the five non-WSF districts, with ELL students trending slightly upward in FY 2022 and students with disabilities remaining relatively stable in FY 2021 and FY 2022. Figure 2-17b shows that ridge ASCM effect estimates of WSF on RLA proficiency rates for all groups in MNPS appear to be negative or no difference in comparison to schools among the five non-WSF districts, except for all students in FY 2018. For ED students, WSF had a negative, statistically significant impact in reading proficiency in FY 2021 and FY 2022.

The overall ASCM effect estimates for math and RLA proficiency rates show uncertainty. Similar to effect estimates for MNPS graduation rates, the majority of the effect estimates for math and RLA proficiency rates are insignificant, indicating that we are again unable to draw causal conclusions about WSF's impact on math and RLA proficiency rates in MNPS overall. The introduction of WSF in MNPS does not appear to have a consistent, significant impact on any group in the study.

Outcomes-Based Equity in SCS

The analysis now focuses on the ridge ASCM effect estimates of WSF on SCS's graduation, math proficiency, and RLA proficiency rates for economically disadvantaged students, ELL students, and students with disabilities, as well as across all students. Post WSF implementation, SCS's graduation rates for most groups, except students with disabilities, either trended negatively or remained neutral. Conversely, math and RLA proficiency rates indicate a more positive outlook for SCS in comparison to non-WSF districts. However, the data lacks statistical significance, preventing definitive causal conclusions about WSF's impact on these rates.

Figure 2-18 shows ridge ASCM effect estimates of WSF on SCS graduation rates from FY 2012 to FY 2022 for four groups of students: economically disadvantaged students (ED, blue line), students with disabilities (SWD, red line), English Language Learners (ELL, green line), and all students (All, orange). The Figure 2-shows differences between graduation rates in schools in SCS and a de-biased synthetic control mean of graduation rates in comparison schools in the non-WSF districts using the ridge augmented synthetic control method. The horizontal line at zero indicates that there is no difference between the treated SCS district and the augmented synthetic control non-WSF comparison districts. The difference in graduation rates between the comparison schools in the non-WSF districts and the treated schools in SCS should be close to zero in the years prior to WSF implementation if each comparison group sufficiently resembles characteristics and trends of the treated district. The vertical dashed line represents the first fiscal year WSF treatment began districtwide, FY 2019, in SCS.

The trend lines for all groups, except students with disabilities, are negative or close to zero throughout the fiscal years post WSF implementation. The graduation rate trend line for

students with disabilities has remained consistently positive though fluctuating between an upward and downward trajectory between FY 2019 and FY 2022. Students with disabilities in SCS appear to have a slight upward and positive trend in graduation rates for FY 2022 while ELL and all students have a consistent and negative difference in graduation rates for FY 2021 and FY 2022 compared to the schools in the five non-WSF comparison districts. While the difference between graduation rates for SCS and the five comparison districts is not as negative for economically disadvantaged students, effect estimates are negative and trending downward between FY 2021 and FY 2022.

Similar to MNPS, the effect estimates for SCS remain ambiguous. The subgroups predominantly exhibit broad confidence bands, and none of the effect estimates reach statistical significance. This suggests that we cannot infer definitive causal relationships regarding WSF's exact influence on graduation rates in SCS. The implementation of WSF does not currently appear to lead to a distinct or consistent effect on the student groups in this study.

Figure 2-19 shows ridge ASCM effect estimates of WSF on SCS math and RLA proficiency rates from FY 2013 to FY 2022 for four groups of students: economically disadvantaged students (ED, blue line), students with disabilities (SWD, red line), English Language Learners (ELL, green line), and all students (All, orange line). The lines for each group show differences between math (Figure 2-19a) and RLA (Figure 2-19b) proficiency rates in schools in SCS and a de-biased synthetic control mean of math and RLA proficiency rates in comparison schools in the non-WSF districts using the ridge augmented synthetic control method.

Unlike graduation rates in SCS, math and RLA proficiency rates have a more positive difference overall in SCS compared to the five non-WSF districts post WSF implementation.

Figure 2-19a shows that ridge ASCM effect estimates of WSF on math proficiency rates for ELL students has a positive, upward trend between FY 2019 and FY 2022. However, the difference in math proficiency rates for economically disadvantaged students, students with disabilities, and all students in SCS compared to the five non-WSF districts is close to zero across all fiscal years post WSF implementation. For RLA proficiency rates, all student groups show a positive difference in ASCM effect estimates in FY 2022 for SCS in comparison to the non-WSF districts. For ELL students, WSF had a statistically significant, positive impact on RLA proficiency rates in FY 2022, but results were statistically insignificant for other years and other subgroups.

The majority of ASCM effect estimates for math and RLA proficiency rates in SCS are not statistically significant. Similar to the prior ASCM analyses, this lack of overall statistical significance underscores our inability to assert definitive causal implications regarding WSF's influence on math and RLA proficiency rates in SCS. The implementation of WSF in SCS does not currently appear to lead to a substantial impact on most student groups examined in the study, but ELL students appear to be showing promise.

Other Specification Models

The primary outcomes-based ASCM analysis described in the preceding sections involved a comparison of SCS and MNPS school-level data for graduation rates, math proficiency rates, and RLA proficiency rates to five comparison districts' school-level data. In addition, I also conducted three variations of the original analysis:

- *Variation 1*: an ASCM analysis that to used school-level data, but expanded the comparison districts from the five comparable districts in the original analysis to all districts within the state;

- *Variation 2*: an ASCM analysis that used aggregated, district-wide data for the five comparison districts included in the original analysis; and
- *Variation 3*: an ASCM analysis that used aggregated, district-wide data for all districts within the state.

While the school-level analysis that expanded the comparison districts to all school districts within the state (Variation 1 above) had smaller confidence bands for several of the subgroups, none of the effect estimates were statistically significant at the $p<.10$ level. The variations that used district level data (Variations 2 and 3) did not result in an adequate synthetic control that had pre-WSF effect estimates that were close to zero, so these variations were not included for reference in this paper.

Discussion and Conclusion

The evaluation of the impact of WSF on student outcomes across MNPS and SCS, in comparison to the five non-WSF comparison districts, did not yield definitive results overall. In both MNPS and SCS, no consistent, significant effect on student graduation, math, or RLA proficiency rates was identified post-WSF implementation. The study found fluctuating trends across different student groups, including economically disadvantaged students, English Language Learners, and students with disabilities. Furthermore, the ASCM effect estimates for these outcomes did not achieve statistical significance overall. Further analyses using statewide school-level and district-level data also resulted in inconclusive, non-statistically significant findings. Thus, based on the data and methodologies, the impact of WSF on outcomes-based equity remains ambiguous, highlighting the need for further research using alternative analytical approaches or more granular or robust data to derive more definitive conclusions.

While the findings of this study overall were not statistically significant, some trends were identified. The study reveals a progressive trend in spending on economically disadvantaged students and students with disabilities across all fiscal years reviewed, with Knox County being the most progressive district in per pupil state and local spending. In contrast, the spending trend for ELL students, in both MNPS and SCS, was found to be regressive, with the relationship between the percentage of ELL students and state and local per pupil expenditures declining over time in MNPS. However, both districts had overall progressive funding for students with disabilities and economically disadvantaged students. The progressive trend in spending suggests more equitable educational opportunities for students in need, especially those who are economically disadvantaged or have disabilities.

The regressive spending on ELL students, predominantly observed in MNPS, suggests the need for deeper investigation. Possible causes for this trend include the formula's indirect progressivity, student mixing by income status between school districts, possible inaccuracies in the school-level expenditure data, or inadequacies in policy implementation. The indirect progressivity of a formula is influenced by how closely related the elements of the formula, which are not directly aimed at economically disadvantaged students (such as those for students with disabilities or ELL students), are correlated with income status. The relationship between these components and income status can result in either positive or negative indirect progressivity of a weighted student funding formula (Candelaria, Fazlul, Kodel, and Shores, 2023). In addition, the way students are grouped within school districts impacts progressivity. Greater diversity in student backgrounds within a district can challenge the precise allocation of resources to economically disadvantaged students (Candelaria, Fazlul, Kodel, and Shores, 2023). The regressive ELL spending could also be linked to inadequate policy implementation and

resource allocation for this group or could be attributed to the dynamic nature of student funding weights. Funding priorities are ever-changing, influenced by a variety of factors, like shifting student demographics, legislative changes, budgetary constraints, and evolving educational priorities. This dynamic characteristic ensures that even the most well-intentioned funding formulas will experience variations over time, necessitating further exploration and potential reconsideration of these formulas in their real-world application.

Regardless of the exact causes of the observed regressive spending for ELL students, assuming the analyzed data is accurate, the immediate implications of these findings are concerning. A decreasing trend in resource allocation for ELL students such that schools with more ELL students receive less per pupil spending than schools with fewer ELL students suggests possible broader systemic inadequacies. Given that ELL students often require specialized instructional resources, support mechanisms, and tailored interventions, any shortfall in funding can magnify the challenges they face. Over time, spending less on these students relative to their non-ELL peers should generally be expected to result in more pronounced educational disparities, ranging from academic underperformance to lower graduation rates and diminished post-secondary opportunities. Addressing these concerns through more intentional policies or WSF formula modifications can help ensure ELL students receive adequate support and resources.

It is important to acknowledge the limitations of this study that may affect the observed resource equity and outcomes-based equity findings. In terms of resource equity, WSF is only one part of the expenditure variable used in the analysis. The NERD$ dataset does not differentiate between Central Office and WSF allocations, so the regressivity observed for ELL students may not be an accurate representation in terms of WSF allocations. The analyses were

also limited by the lack of student-level data. The negative effect observed for some subgroups in the outcomes-based analysis, as well as the overall inconclusive findings, was likely affected by the lack of granular data. Chapter 4, however, uses student-level data to provide a more comprehensive and deeper examination of the impact of WSF combined with site-based budgeting in MNPS, and the chapter is able to present more consistent, statistically significant findings.

Furthermore, although Knox County was notably more progressive than the other districts in the observed fiscal years, the unavailability of pre-WSF fiscal data poses a significant challenge in comprehensively assessing WSF's impact in MNPS and SCS, making it unclear what effect WSF had on resource equity. It is possible that both MNPS and SCS had a much lower baseline of state and local spending for economically disadvantaged students, ELL student, and students with disabilities prior to implementing WSF, so WSF may actually be associated with a more significant increase in resource equity when comparing pre- and post-WSF implementation. Additionally, this study does not observe the school and district level finance approaches in non-WSF districts, such as Knox County. More research would be needed to determine what mechanisms are contributing to the possible increased progressivity in Knox County.

While many districts have leaned on WSF as a primary instrument to level the playing field, Knox County's resource progressivity suggests that other fiscal and administrative strategies might be as effective, if not more so. This underscores the importance of a holistic approach to educational funding, where mechanisms like WSF may be one of many tools rather than the sole approach. It also highlights the significance of understanding local contexts, student needs, and the effectiveness of internal financial mechanisms in driving equitable resource

distribution. Further exploration into the specific resource allocation strategies employed by Knox County could potentially provide insights to other districts aiming to attain similar equity without strictly adhering to the WSF model.

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Tables

Table 2-1. MNPS and SCS Weights in Initial WSF Year

District	Year	Weights	ES	MS	HS
MNPS	2015-16	Base Weight (1.0)	$4,250		
		Grade Weight	0.1	0.05	-
		Prior Academic Performance (Poverty as a Proxy in ES)	0.1	0.1	0.15
		ELL	0.1		
		Special Education	Varies by option Type		
SCS	2018-19	Base Weight (1.0)	$3,400		
		Grade Weight	0.2 to 0.3	-	-
		Incoming Student Performance (high and low)	0.1	0.1	0.1
		Mobility	0.1		
		Special Education	0.24		

Source: Metro Nashville Public Schools Budget Flexibility Guide SY2015-16 Principal and Shelby County Schools Back to students: Student-Based Budgeting Principal Handbook SY2018-19

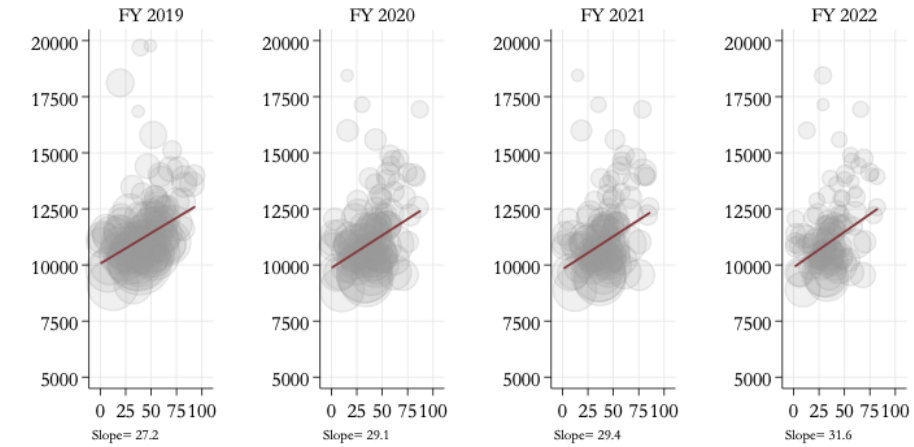
Table 2-2. School Characteristics for WSF Districts and Non-WSF Comparison Districts

Year	District	Enrollment	Female %	Male %	Black %	White %	Hispanic %	Asian %	Economically Disadvantaged %	ELL %	Students with Disabilities %
2021-22	State of Tennessee	967,356	49	51	24	60	13	3	30	8	13
2021-22	Memphis-Shelby County Schools	102,221	50	50	75	6	18	1	57	13	10
2021-22	Metro Nashville Public Schools	77,479	49	51	39	25	31	4	35	27	12
2021-22	Knox County	58,873	49	51	17	67	12	3	21	8	14
2021-22	Rutherford County	48,669	49	51	21	54	19	5	16	13	9
2021-22	Hamilton County	44,186	49	51	30	48	18	3	28	11	13
2021-22	Clarksville-Montgomery County	37,043	49	51	32	48	15	3	25	4	14
2021-22	Sumner County	29,818	49	51	13	73	11	2	18	5	14

Source: Tennessee Department of Education administrative data from the SY2021-22 School Profile

Figures

Figure 2-1. MNPS School-Level Spending versus Percent Poverty



Regression line weighted by total school enrollment

Figure 2-2. MNPS Per Pupil Spending Progressivity: Economic Disadvantage

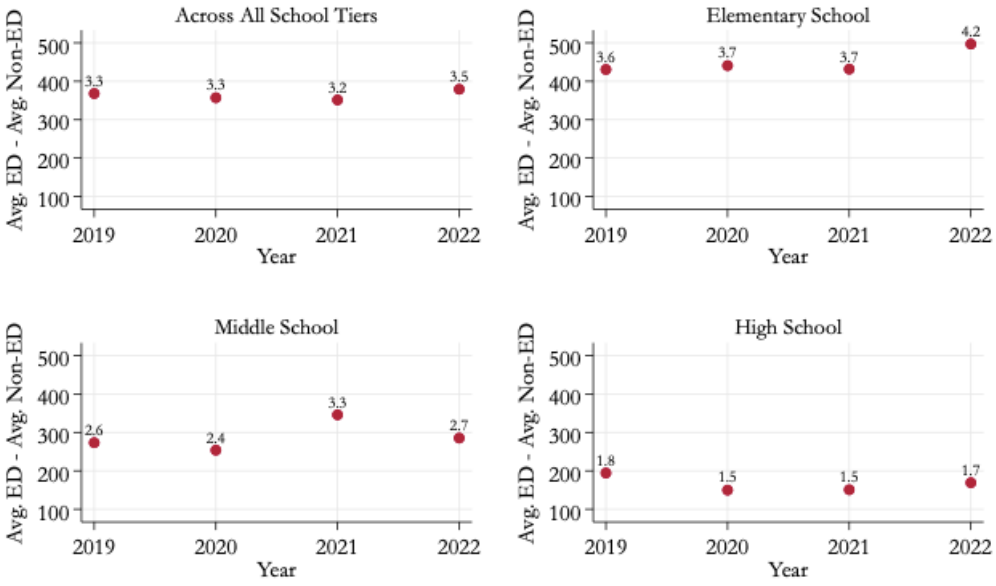
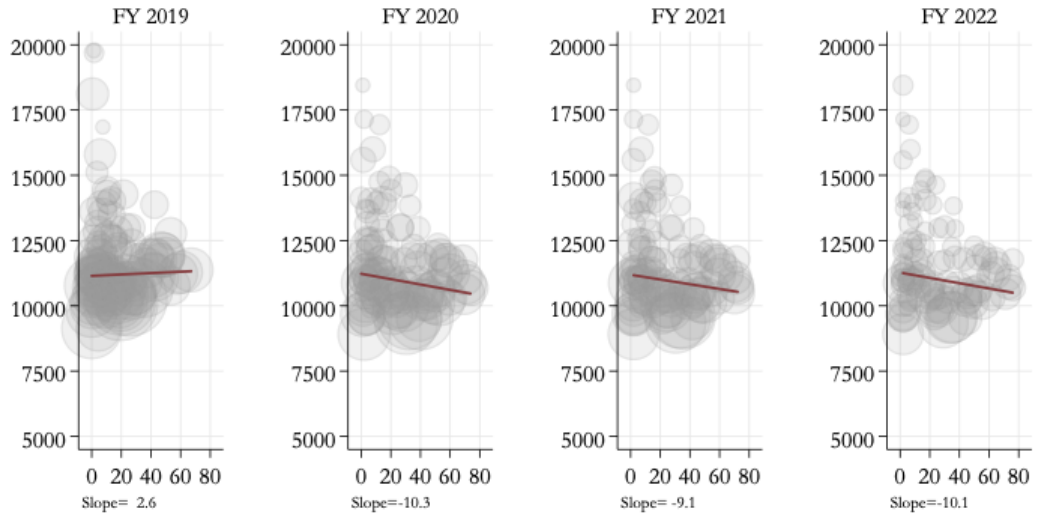


Figure 2-3. MNPS School-Level Spending versus Percent ELL



Regression line weighted by total school enrollment

Figure 2-4. MNPS Per Pupil Spending Progressivity: ELL

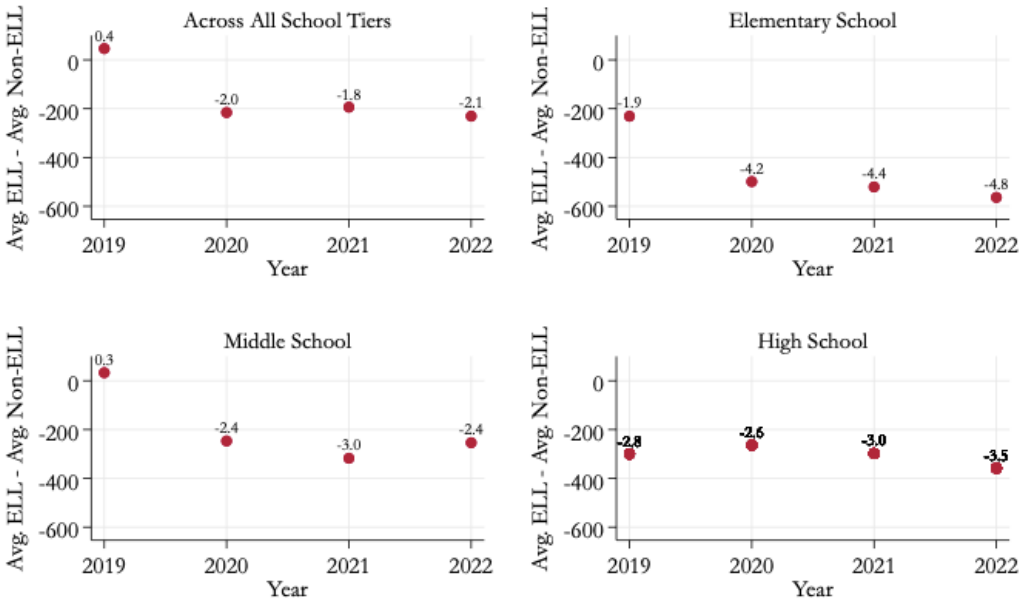
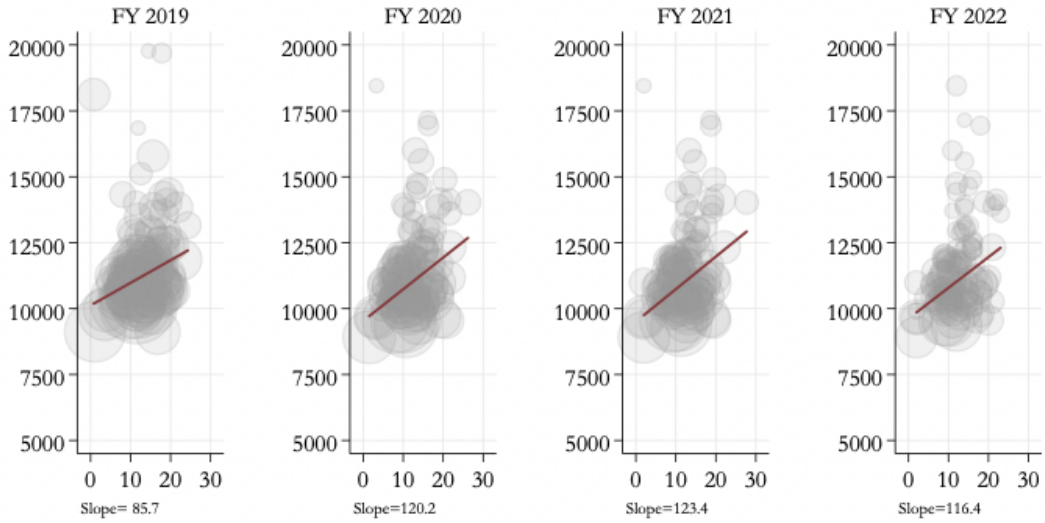


Figure 2-5. MNPS School-Level Spending versus Percent Students with Disabilities



Regression line weighted by total school enrollment

Figure 2-6. MNPS Per Pupil Spending Progressivity: Students with Disabilities

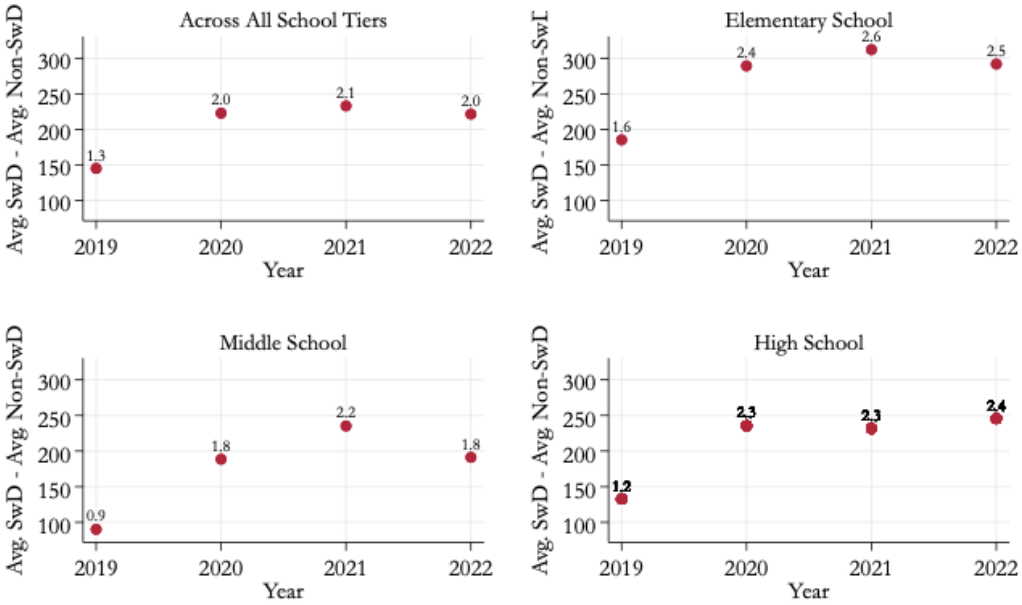
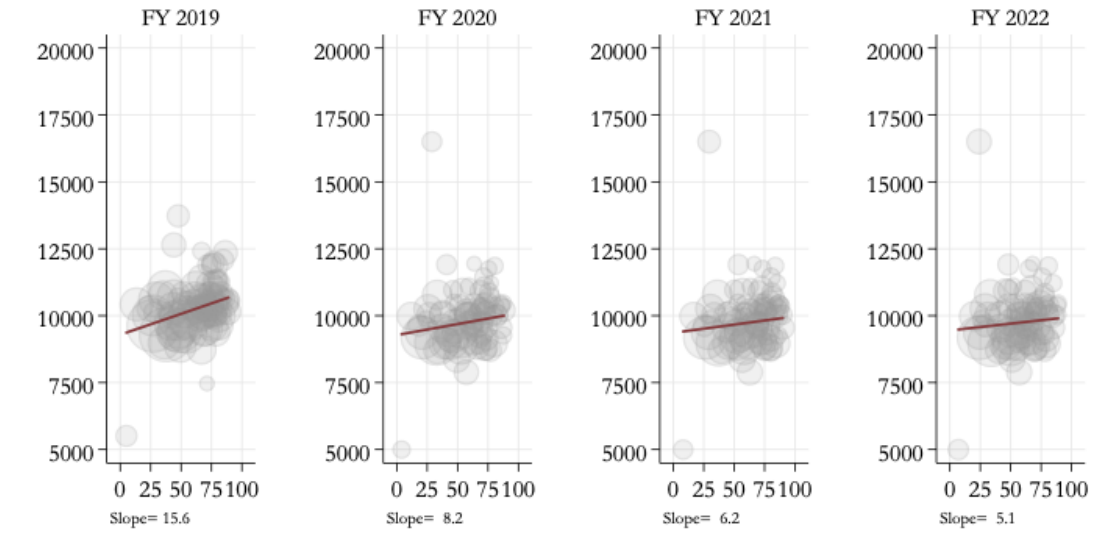


Figure 2-7. SCS School-Level Spending versus Percent Poverty



Regression line weighted by total school enrollment

Figure 2-8. SCS Per Pupil Spending Progressivity: Economic Disadvantage

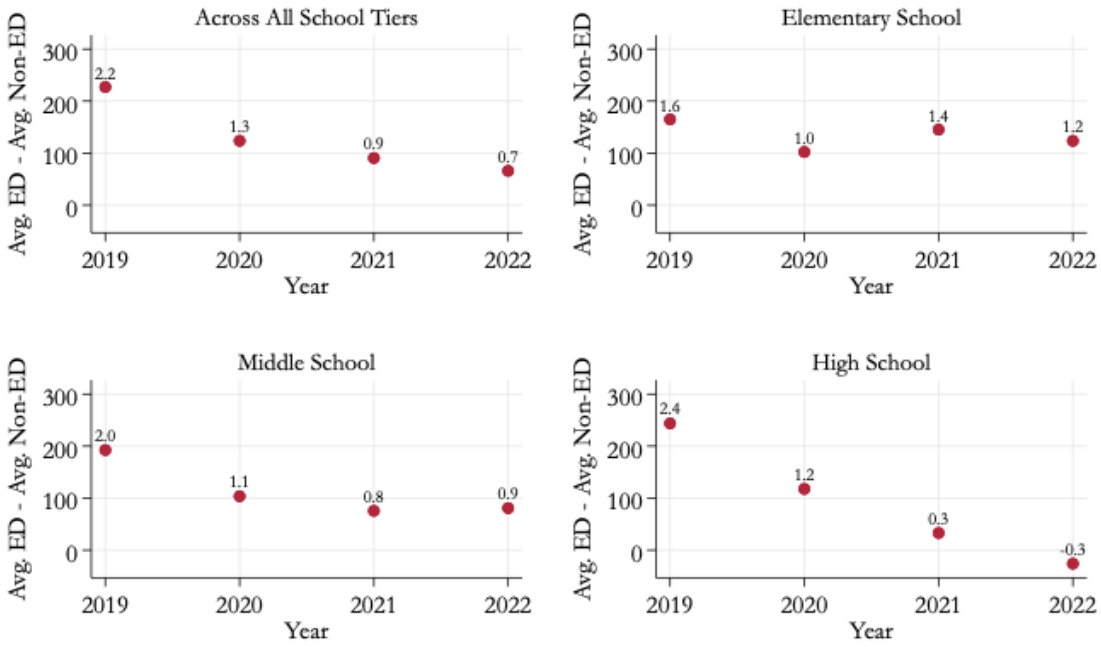
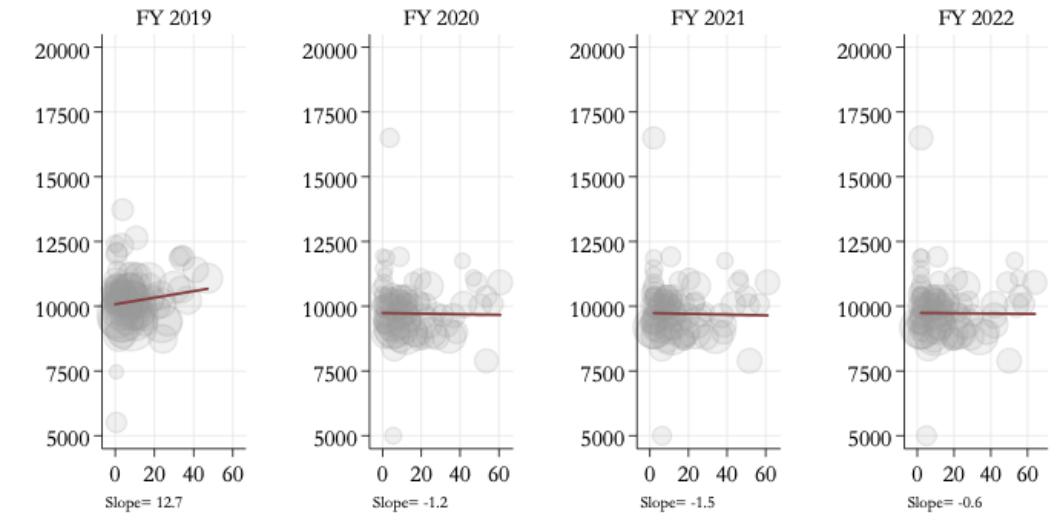


Figure 2-9. SCS School-Level Spending versus Percent ELL



Regression line weighted by total school enrollment

Figure 2-10. SCS Per Pupil Spending Progressivity: ELL

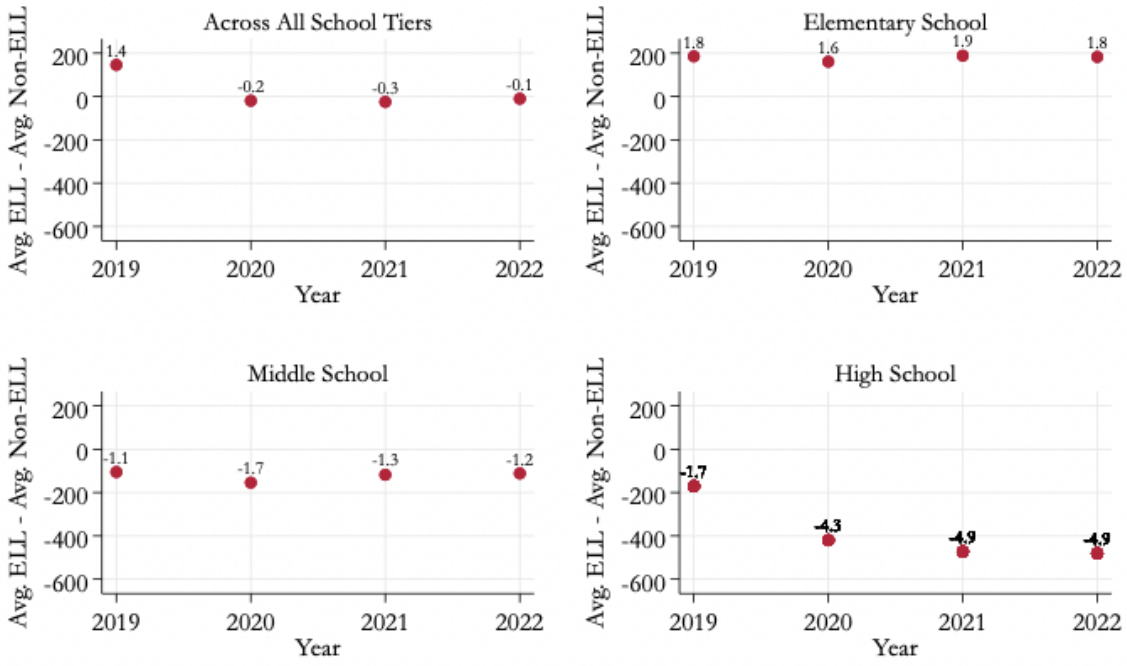
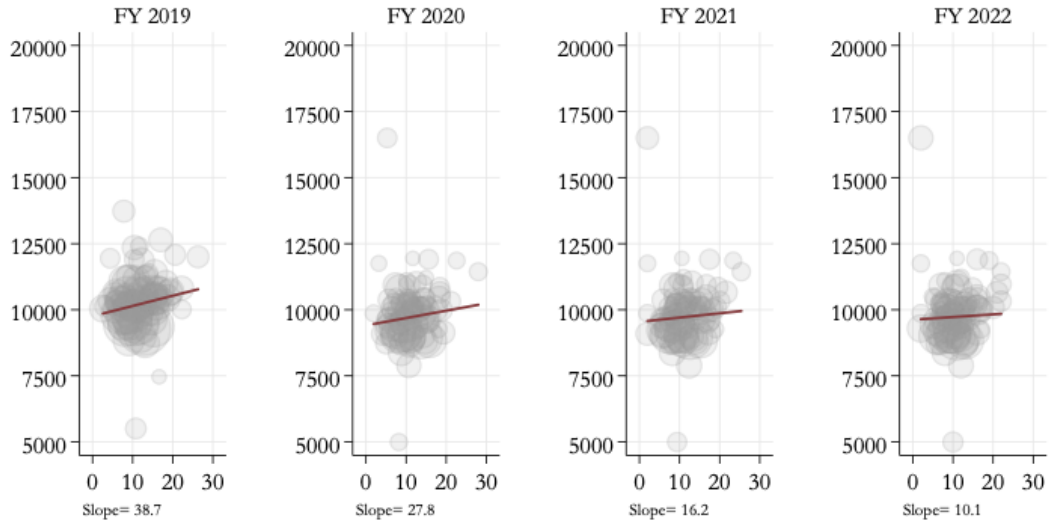


Figure 2-11. SCS School-Level Spending versus Percent Students with Disabilities



Regression line weighted by total school enrollment

Figure 2-12. SCS Per Pupil Spending Progressivity: Students with Disabilities

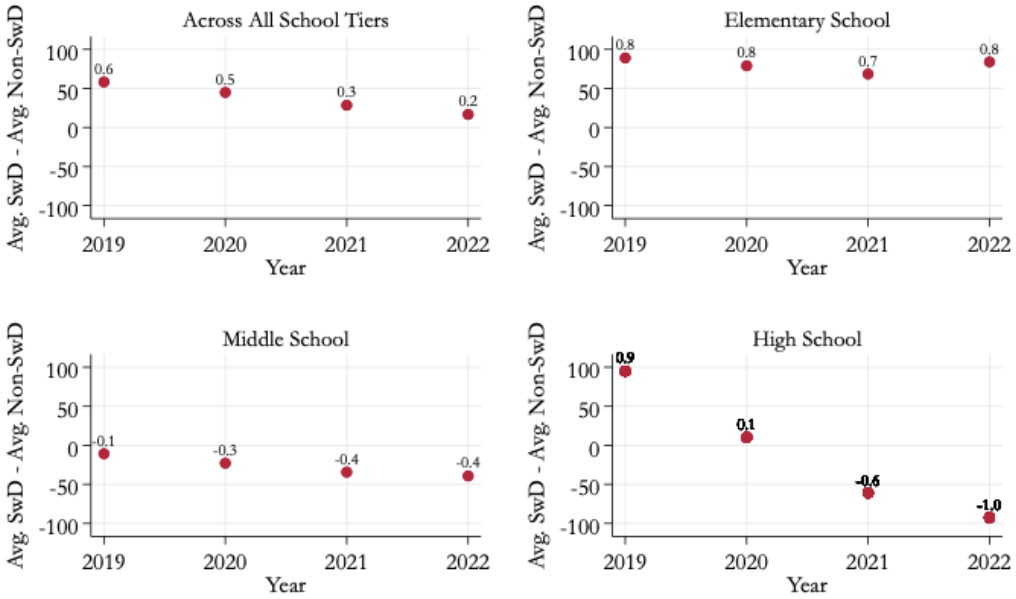


Figure 2-13. Inter-District Per Pupil Spending Progressivity: Economic Disadvantage

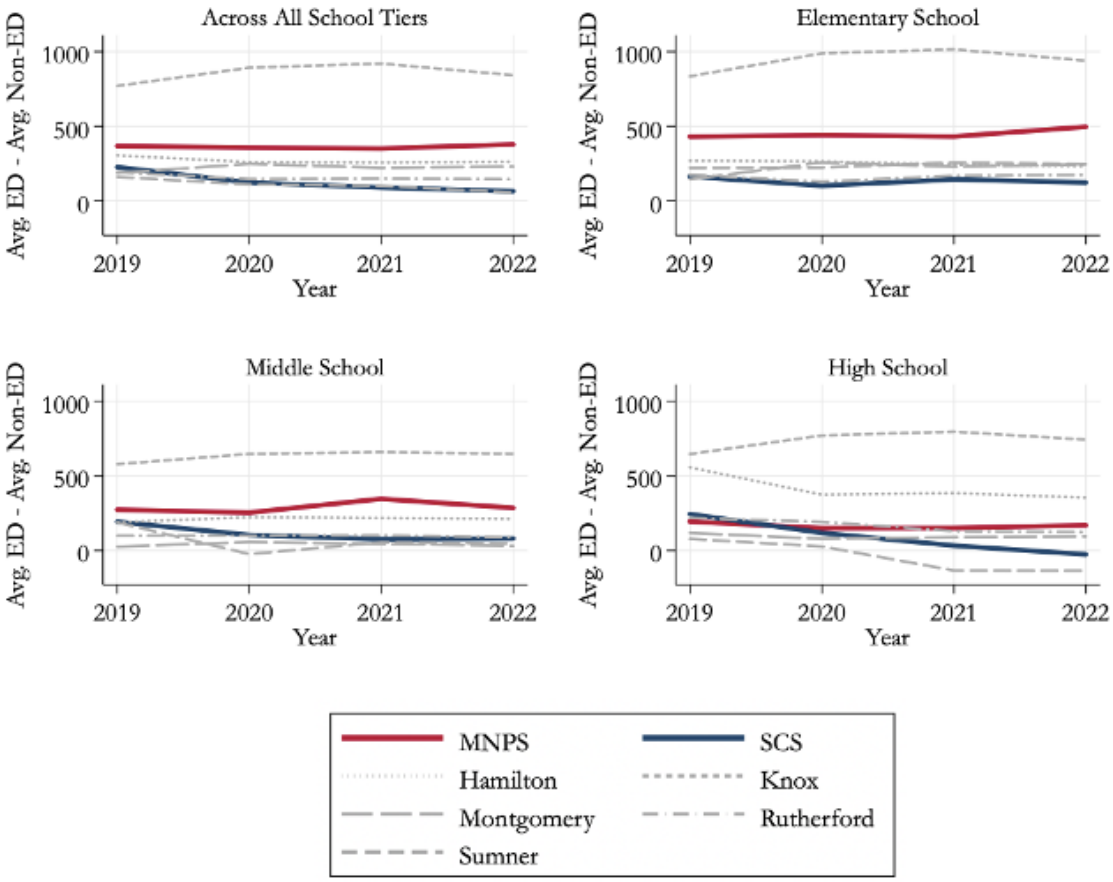


Figure 2-14. Inter-District Per Pupil Spending Progressivity: ELL

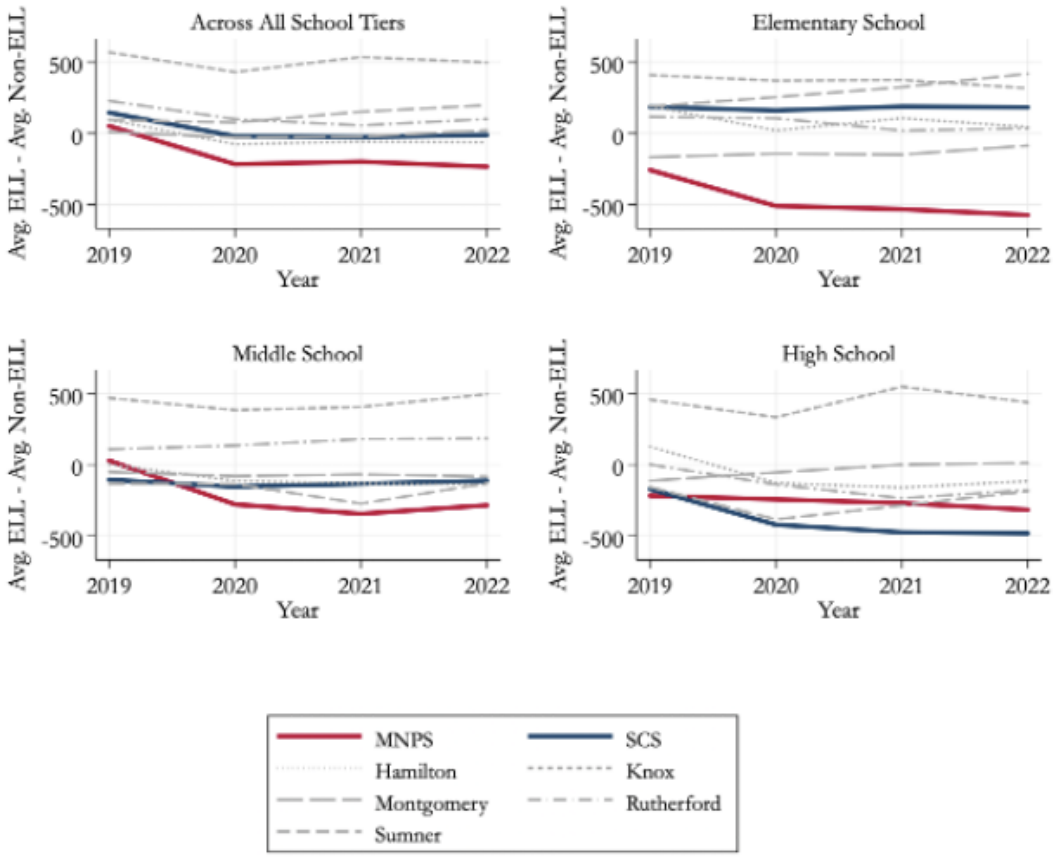


Figure 2-15. Inter-District Per Pupil Spending Progressivity: Students with Disabilities

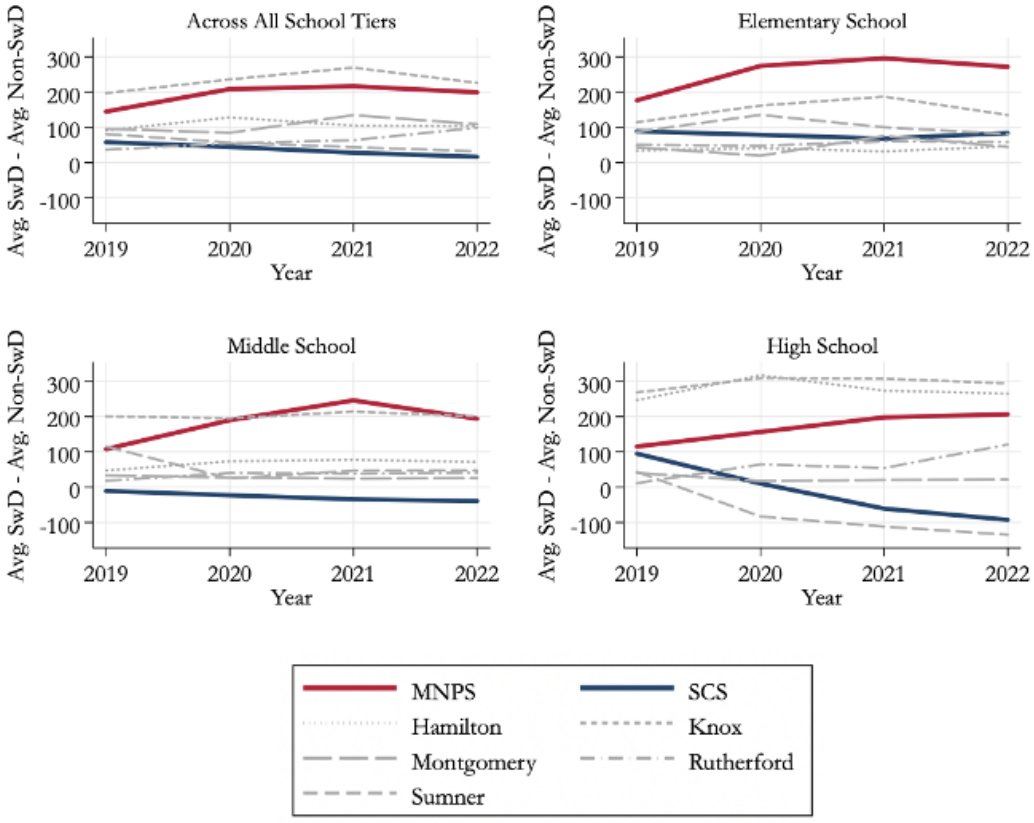
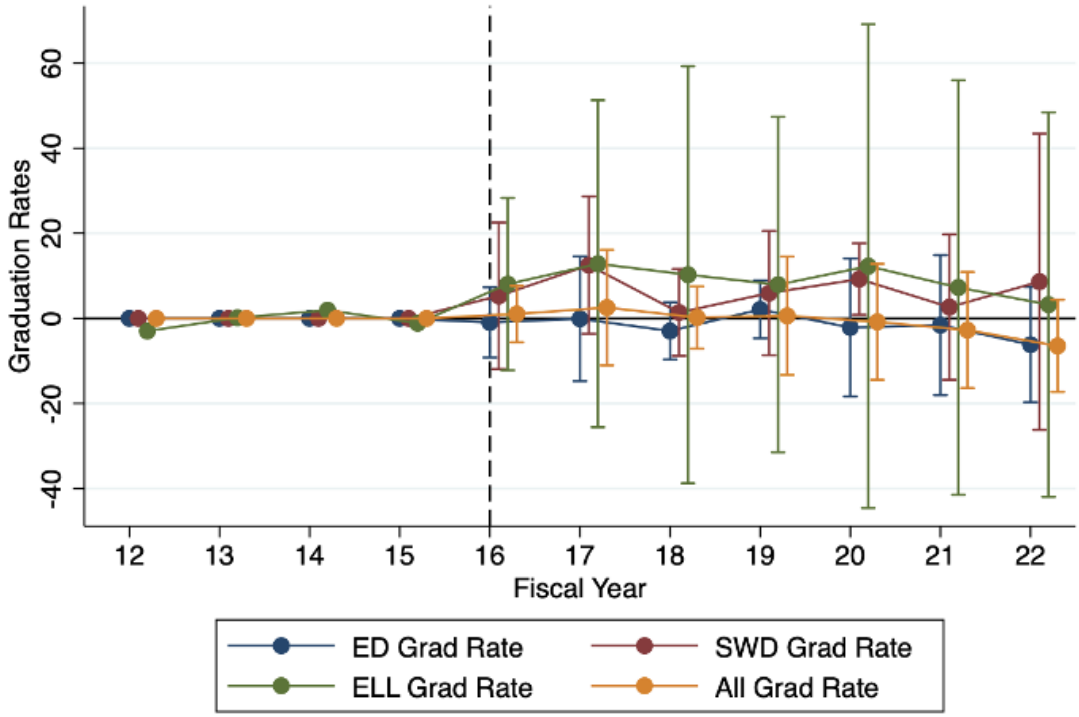


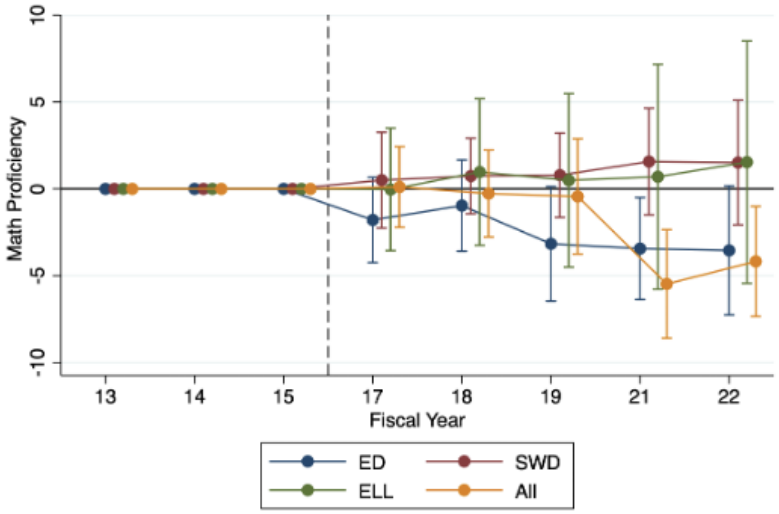
Figure 2-16. Ridge ASCM Effect Estimates of WSF on Graduation Rates in MNPS



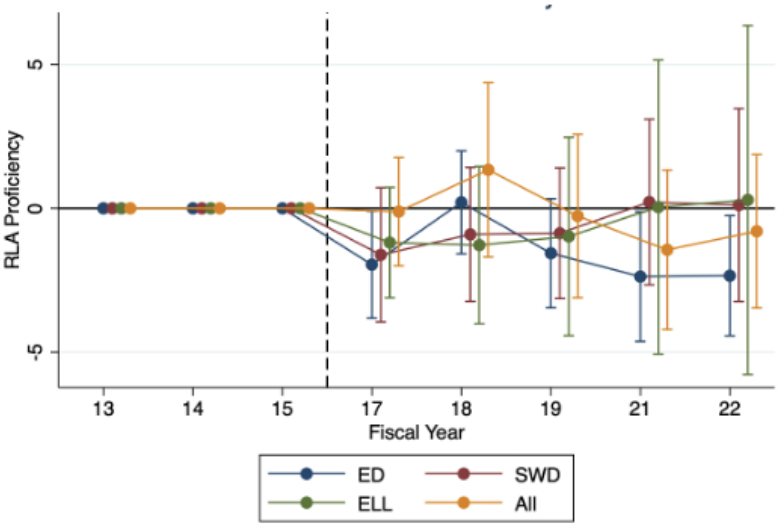
Note: Ridge ASCM effect estimates for each district-year compared to its counterfactual are displayed. Round markers signify effect estimates, while the extended spike lines indicate 90% confidence intervals. The dashed vertical line marks the fiscal year of the WSF reform.

Figure 2-17. Ridge ASCM Effect Estimates of WSF on Proficiency Rates in MNPS

Panel A. Ridge ASCM Effect Estimates of WSF on Math Proficiency Rates in MNPS

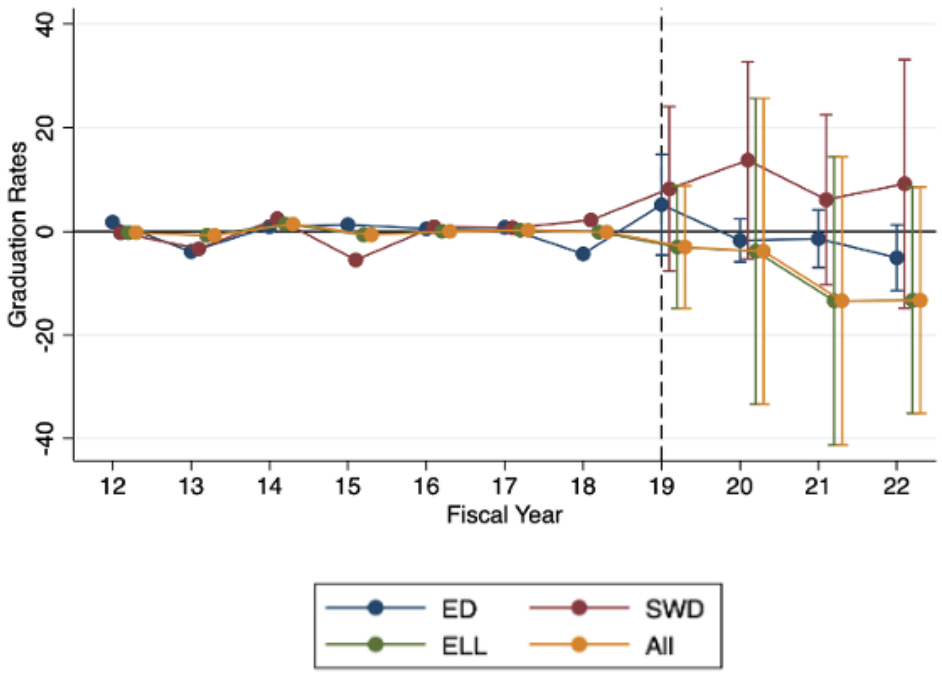


Panel B. Ridge ASCM Effect Estimates of WSF on RLA Proficiency Rates in MNPS



Note: Ridge ASCM effect estimates for each district-year compared to its counterfactual are displayed. Round markers signify effect estimates, while the extended spike lines indicate 90% confidence intervals. The dashed vertical line marks the fiscal year of the WSF reform.

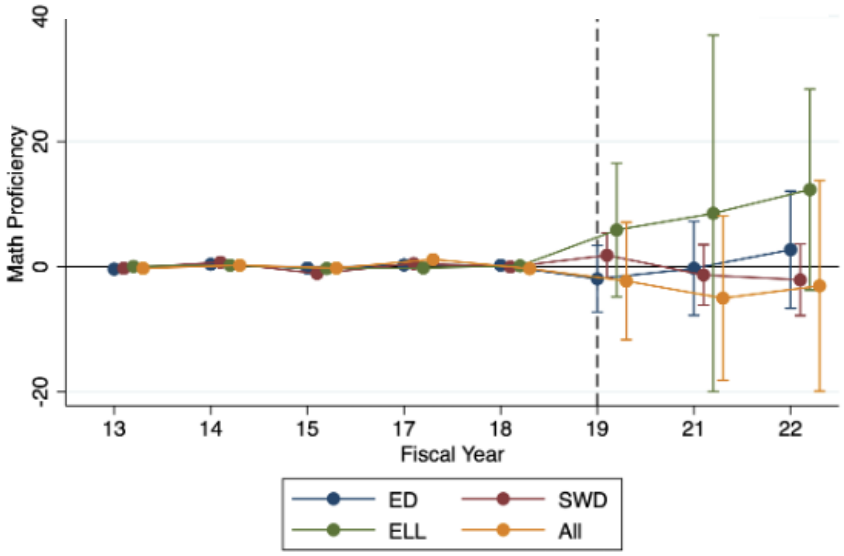
Figure 2-18. Ridge ASCM Effect Estimates of WSF on Graduation Rates in SCS



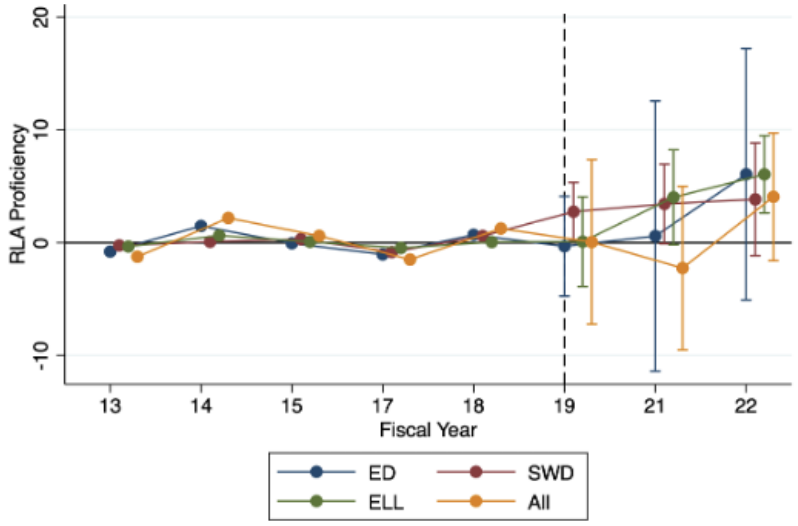
Note: Ridge ASCM effect estimates for each district-year compared to its counterfactual are displayed. Round markers signify effect estimates, while the extended spike lines indicate 90% confidence intervals. The dashed vertical line marks the fiscal year of the WSF reform.

Figure 2-19. Ridge ASCM Effect Estimates of WSF on Proficiency Rates in SCS

Panel A. Ridge ASCM Effect Estimates of WSF on Math Proficiency Rates in SCS



Panel B. Ridge ASCM Effect Estimates of WSF on RLA Proficiency Rates in SCS



Note: Ridge ASCM effect estimates for each district-year compared to its counterfactual are displayed. Round markers signify effect estimates, while the extended spike lines indicate 90% confidence intervals. The dashed vertical line marks the fiscal year of the WSF reform.

Chapter 3

Toward a Conceptualization of Equity-Focused Research Management:

A Multiple Case Study Approach in Metro Nashville Public Schools

Introduction

Principals play a pivotal role in shaping student outcomes by influencing the conditions for student learning (Grissom, Egalite, & Lindsay, 2021). Central to these conditions is the adept management of resources within schools. The methods used to allocate are intrinsically tied to the quality of education students receive, directly impacting their educational opportunities (Lynch & Baker, 2005). Contemporary studies suggest that principals who effectively manage resources, including time and personnel, positively impact both student outcomes and teacher satisfaction (Grissom, Egalite, & Lindsay, 2021; Grissom and Loeb, 2011; Horng, Klasik, and Loeb, 2010). Yet there remains a gap in research on how principals strategically manage financial resources to provide access to equitable educational opportunity.

Though principals often have a limited role in the school budgeting and resource allocation process (Chang, 2018; Odden & Picus, 2019), student-based budgeting grants principals greater flexibility over resource distribution in their school and provides a means for exploring how principals allocate resources to meet student learning needs. Student-based budgeting allows school leaders to play an important role in allocating the resources necessary to reduce opportunity gaps and improve student outcomes, particularly for historically underserved students in the public education system (Baker, 2009). Under student-based budgeting, students

with greater need are provided a higher proportion of resources, such as students with disabilities, economically disadvantaged students, and English language learners. This resource allocation approach assumes that principals and other school-level professionals are better equipped to understand students' educational needs within their school and can best utilize resources to address those needs and improve student outcomes, particularly for historically marginalized and disadvantaged student subgroups (Chambers et al., 2010; Annenberg Institute, 2002). For student-based budgeting to produce the desired effect of improving student outcomes, principals must be able to determine the cost of educating diverse categories of students and identify the services required for these students to be successful. The district's allocation of school-level funds must also be informed by the knowledge of these costs and services to ensure equitable resource allocation (Malen et al., 2017; Foley, 2010; Ladd, 2008).

The role of school leaders in influencing student outcomes has garnered increasing attention in research; however, there remains a scarcity of studies that delve into how these leaders tackle the educational disparities faced by historically underserved students (Ishimaru & Galloway, 2014; Cambron-McCabe & McCarthy, 2005; Theoharris, 2007). In-depth research is notably absent on how principals strategically utilize resources to bridge these opportunity gaps and foster equitable outcomes (Grissom, Egalite, & Lindsay, 2021). Because resource management could potentially enhance student outcomes, there is a pressing need for deeper exploration into the decision-making processes of principals. Student-based budgeting empowers principals to align resource allocations with specific student needs, offering researchers a unique window into understanding the resource allocation decisions made by these school leaders and the role of equity considerations during their allocation process.

To that end, this study explores how Metro Nashville Public School (MNPS) principals manage and allocate resources as well as how their understanding of equity shapes these practices. Specifically, my study will address the following questions:

1. How do principals conceptualize equity within their school?
2. How does their equity conceptualization influence resource allocation decisions?

For these research questions, I use a series of semi-structured qualitative interviews informed by an equity-focused leadership framework developed by Ishimaru and Galloway (2014). By using this framework, I am able to analyze the perspectives and practices of principals within the context of equity. The qualitative interviews serve as a valuable tool for gaining a deeper understanding of how principals in MNPS conceptualize equity. Moreover, these interviews provide insight on the intricate ways in which these equity conceptualizations shape and influence their decision-making and resource management practices within their school.

To achieve a more comprehensive understanding of how principals conceptualize equity and allocate resources, I incorporate teacher focus group data as a triangulating source. By triangulating the findings from principal interviews with teacher focus group data, I aim to capture a richer and more nuanced picture of how equity ideals manifest in educational settings and inform the allocation of resources. This multi-perspective approach enhances the robustness and depth of the analysis, allowing more meaningful conclusions regarding the intricate relationship between equity conceptualizations, leadership practices, and resource allocation within schools.

The findings reveal that school principals' understanding of equity is influenced by their school's unique characteristics, such as socio-economic and racial dynamics. Most adopt an

asset-based perspective, focusing on systemic challenges rather than individual shortcomings. In resource allocation, they address both academic and holistic needs, with a significant emphasis on human capital. Stakeholder involvement in decision-making varies, with some principals leaning towards teacher-centric methods, while others engage a broader community base, ensuring diverse perspectives in resource allocation and fostering a collaborative environment.

The next section discusses the theoretical foundation that guides this paper, offering deeper insights into the equity-focused principles that inform their leadership approach.

Conceptual Framework

The conceptual framework for this paper is informed by the equity-focused organizational leadership framework, which emphasizes both educational equity and social justice in guiding educational leaders. Central to this framework are principals who understand existing educational disparities and enact strategies to address them, emphasizing collaboration with teachers, using data-driven decision-making, and engaging in continuous improvement cycles. This study uses the equity-focused organizational leadership framework to explore how principals interpret equity and its subsequent influence on resource allocation decisions.

Equity-Focused Resource Management

Equity-focused organizational leadership, as conceptualized by Ishimaru and Galloway (2014), incorporates educational equity and social-justice leadership. Educational equity acknowledges that an equitable education system often requires an unequal allocation of resources (Ishimaru & Galloway, 2014; Brayboy et al., 2007). It focuses on fair outcomes within an unequal schooling context and emphasizes the cultural strengths and inherent potential of diverse students (Jordan, 2010; Ishimaru & Galloway, 2014; Bensimon, 2005; Brayboy, Castagno, & Maughan, 2007). Theoharis defines social justice leaders as principals who "...make

issues of race, class, gender, disability, sexual orientation, and other historically and currently marginalizing conditions in the United States central to their advocacy, leadership practice, and vision" (p. 223). Social justice leadership in education involves actively working to address and eliminate marginalization in schools (Theoharis, 2007). Social justice leaders work to establish an inclusive, collaborative, and democratic schooling environment as well as recognize that resources and opportunities must be unequally distributed to address educational inequities (Ishimaru & Galloway, 2014; Brayboy et al., 2007; Ryan, 2006; Theoharis, 2007; Riehl, 2000).

Principals who lead with an equity-focused lens recognize the role that current school practices and policies have in continuing inequities in schools, such as disciplinary practices that disproportionately target black and brown boys and systematically limit their access to quality instructional time by taking them out of the classroom (Ladson- Billings, 2006; Ishimaru & Galloway, 2014). While education ideally should provide all students with equal opportunity for success, race and group-based disparities continue to negatively affect student outcomes (Brayboy, Castagno, & Maughan, 2007; Nieto, 2005; Lee, 2009; Ishimaru & Galloway, 2014). Educational equity can mitigate these disparities by ensuring that students have access to the resources they need to succeed.

Within the equity-focused organizational leadership framework, principals' interaction with the school community, especially teachers, provides important insight into the equity-focused orientation of principals. Equity-focused leaders practice a distributed leadership style in which teachers have a more active leadership role and work with teachers to identify and mitigate inequities within the school building (Gooden, 2012; Togneri & Anderson, 2003). These leaders actively build the capacity of their staff to engage in meaningful and collaborative work to accomplish the equity vision of their school (Ishimaru & Galloway, 2014; Anderson, 2009).

They also assess and provide feedback to teachers on how to improve equitable instructional practice in the classroom (Ishimaru & Galloway, 2014).

Principals who use equity-focused organizational leadership may allocate school resources to professional development of teachers that helps them better address the needs of all students within the school and build their capacity for equitable instruction (Williams et al., 2005; Odden, 2009; Marzano, 2003; Togneri & Anderson, 2003). These school leaders may also invest additional resources in providing support for underperforming students and increasing instructional capacity and equity through additional supports such as extended school days (Odden, 2009; Blakenstein, 2004; Marzano, 2003). Principals who allocate resources to these areas can lead to improved educational outcomes for marginalized students (Williams et al., 2005; Odden and Picus, 2019).

Equity-focused organizational leadership views leadership practice as the primary unit of change and as a means to improve or hinder equitable education systems. Ishimaru and Galloway (2014) include three drivers of equitable leadership practice in their conceptualization of equity-focused organizational leadership, which include framing of disparities and action, the construction and enactment of leadership, and the creation and integration of a culture of inquiry. These three drivers collectively are used to show how leadership practices are carried out to increase equitable outcomes.

Framing Disparities and Action

The first equity-focused driver, framing disparities and action, focuses on how school leaders conceptualize what a problem is and how they act on that problem. The understanding of the problem and the actions taken to address the problem can range from a deficit orientation that places blame on individuals to an equity-focused orientation on systemic barriers (Ishimaru and

Galloway, 2014). Framing is an important aspect of leadership since it shapes how leaders mobilize others in their school (Roegman, 2020; Benford & Snow, 2000). Equity-focused practice uses an asset-based approach and frames disparities by considering school practice and policy. Disparities are addressed in ways that are inclusive for all in the school community (Ishimaru and Galloway, 2014). Applying this driver to student-based budgeting and principal resource management practices entails exploring how principals conceptualize the problem of inequitable student outcomes and how they use resource allocation practices to address this problem. Action can range from being nonexistent to initiating collective, systemic changes (Ishimaru and Galloway, 2014). Principals with a deficit orientation may allocate resources in ways that continue to maintain the status quo in their school rather than address problems related to power and systemic change (Ishimaru and Galloway, 2014). Teachers can provide insight into how principals address systemic barriers in their school and whether allocation decisions have led to observable, positive change at the classroom level or in the culture and climate of the school.

Construction and Enactment of Leadership

The second driver, construction and enactment of leadership, involves considering the role of different individuals in the leadership process and decision-making process (Ishimaru and Galloway, 2014). Leadership is distributed among key stakeholders, such as students, parents, and teachers, each having an opportunity to engage meaningfully in equity work within the school (Roegman, 2020, Togneri & Anderson, 2003; Ishimaru and Galloway, 2014). Equity-focused leaders ensure that stakeholders have the space and opportunity available to meet and effectively work together to identify problem areas and means for addressing the identified problems (Roegman, 2020; Wasonga, 2009; Ishimaru and Galloway, 2014). This driver applied

to the context of resource management practices includes a consideration of how principals include teachers, colleagues, and other key stakeholders in their SBB resource management and allocation process and how their engagement with stakeholders may shape their approach to improving equity. Teachers can directly speak to the level of meaningful engagement principals offer them in the SBB resource allocation process.

Culture of Inquiry

The third driver, culture of inquiry, addresses the manner in which equity-oriented leaders create a school environment where inquiry and continuous improvement are promoted and prioritized (Ishimaru and Galloway, 2014). Leaders constantly use data to find inequities in their school and create action plans to address inequities (Roegman, 2020; Skrla et al., 2004). Cycles of inquiry are constant and include all members of the school community. The data used for the inquiry cycle can be quantitative or qualitative and collected from multiple sources. The data also enable principals to examine how practices and policies are helping them reach school goals (Ishimaru and Galloway, 2014). Principals can promote effective data use within their school by developing and managing organizational routines through site-based coaches and professional learning communities (Marsh, Farrell, & Bertrand, 2016; Roegman, 2020). In terms of resource management practices, principals can use disaggregated data to inform how they manage and allocate resources at their school. Principals can also allocate their SBB funds to help promote effective data use in their school, such as hiring coaches who emphasize data use practices or allocating resources to professional development opportunities that help show teachers how to use data more effectively to address inequities in the classroom or school. Teachers can provide insight into how effective those data use conversations are in helping to address inequities at the classroom level.

Summary

Equity-focused organizational leaders address the systemic challenges historically underserved students face. Such leaders actively engage with their school communities to identify and rectify inequities. They leverage data-informed strategies, involve key stakeholders in decision-making processes, and ensure resources are allocated where most needed. This holistic approach presents a multifaceted way of exploring how principals understand equity and allocate resources informed by this understanding. In my analysis, I assess these drivers and how they relate to equity-focused resource management practices.

Methodology

This study uses a collective case study approach, examining how school principals handle resource management within student-based budgeting (SBB) and how their perceptions of equity shape their choices. Interviews with five principals from diverse educational settings shed light on varied perspectives of equity and resource distribution. Further insights are gathered from teacher focus groups, enriching the understanding of how principals shape an equitable school environment, consistent with the drivers of equity-focused leadership defined by Ishimaru & Galloway (2014).

I conducted semi-structured interviews with five principals from MNPS elementary and middle schools, tapping into their diverse experiences in education and budgeting. These discussions explored their varied perspectives on equity and its influence on their resource management strategies. The flexible nature of semi-structured interviews ensured comprehensive coverage of key topics, while also allowing principals the freedom to share insights on matters they deemed important. This approach highlighted nuanced differences and similarities between

principals, potentially overlooked in a more rigid interview structure (Charmaz, 2014). Each interview, conducted via video conferencing, spanned roughly 45 minutes.

The initial study began in Summer 2021 and explored how principals make resource allocation decisions. All MNPS principals were invited to participate in an interview to discuss their SBB decision-making process, their interpretation of equity, and the implications of the COVID-19 pandemic on their resource allocation practices (refer to Appendix A). Of the thirteen principals who participated initially, five consented to join the follow-up study and to refer teachers for the focus group. This paper includes findings from the first follow-up interview with these five principals as well as insights from teacher focus groups.

In this follow-up study, I explore principals' perspectives related to equity-focused leadership and its impact on the resource management process. The principal interview protocol for the second interview (see Appendix B) is informed by the three drivers of equitable leadership practices discussed by Ishimaru & Galloway (2014). The first set of interview questions explore how principals understand equity, frame disparities in educational outcomes, and use resource management practices to equitably address those disparities. The next set of questions focus on the second driver, construction and enactment of leadership, by exploring the role of different stakeholders in the decision-making process for resource allocation (Ishimaru & Galloway, 2014). The protocol also addresses the third driver of equitable practices, the creation and integration of a culture of inquiry (Ishimaru & Galloway, 2014). These questions explore the extent to which principals create a culture of inquiry around equity using various data sources and how this informs their resource allocation practices under SBB.

Additionally, teacher focus groups (see Appendix D) help to triangulate the findings from the principal follow-up interviews. They provide insight into the extent to which these principals

practice a distributed leadership style and create a culture of inquiry, which are both key drivers in equity-focused leadership.

Sample

This study explores equity and resource allocation practices at five schools in MNPS. Each school site participated in principal interviews and teacher focus groups. Each principal completed three interviews over the course of a year and a half beginning in Summer or Fall 2021. A group of approximately four to six teachers participated in one or more teacher focus groups at each school site in Fall 2022 or Winter 2023.

The sample for the study encompassed a diverse group of five principals, varying in experience and backgrounds, from both elementary and middle schools, and a mix of genders. They also had different levels of budgeting expertise, ranging from no budgetary experience prior to the implementation of SBB to supporting or leading budgetary efforts in other districts. The sample consisted of four elementary school principals and one middle school principal. Principal experience ranged from three years to 20 years, with two principals having between three and four years of experience and three principals having between 15 and 20 years of experience. One principal was male and four principals were female. Three principals had prior budgeting experience before working with site-based budgeting in their current district.

Table 3-1 displays a list of participants with their pseudonym, tier level, school pseudonym, years of experience, and prior budgeting experience. The schools ranged from 35 to 55 percent economically disadvantaged, less than 1 to 60 percent English language learners, 8 to 17 percent students with disabilities, and 65 to 100 percent black or Hispanic.

Analytic Approach

To explore how principals perceive equity, this study employed two trained research assistants who utilized NVIVO to code interviews and group sessions, ensuring both precision and reliability. The coding process leveraged a double-coding approach and any discrepancies in coding were collaboratively addressed. The codes inform a cross-case analysis that explores principals' understanding of equity and its influence on resource allocation strategies.

To enhance the credibility and precision of the qualitative analysis, I hired two graduate research assistants, acquainted with the study's overarching aims. These assistants used NVIVO to code each principal interview and teacher focus group session. The research assistants used indexing and flexible coding to apply analytic codes more consistently and efficiently, ensuring that the analysis was not only rigorous but also maintained reliability (Deterding & Waters, 2018).

To further ensure reliability of the qualitative findings, the research assistants used a double-coding approach on a select set of interview transcripts. This technique helped ensure inter-rater reliability, a measure that gauges the uniformity with which different coders apply their codes (Miles, Huberman, & Saldaña, 2014). I acted as the master coder and reviewed each round of coding. When discrepancies or coding questions arose, we held research team meetings to resolve the discrepancies.

The codes informed within-case analytic memos, which were then used to develop cross-case analytic memos, highlighting themes across cases. I used case assertions to report interpreted meaning and lessons from each case (Creswell, 2012). I use a multiple case study approach in order to analyze multiple perspectives on how principals manage resources and the role that their conceptualization of equity has in their allocation decision-making process.

Conceptualizing Equity

Research Question 1: How do principals conceptualize equity within their school?

For research question 1, I focus on the codes that shed light on the nuanced ways in which principals interpret and internalize the concept of equity. I look for commonalities and differences among the factors shaping a principal's perspective on equity. While finding commonalities among the principal responses provides a collective understanding of equity, the variances in perspective also offer important insights into the multifaceted nature of equity. By focusing on how these principals articulate issues of disparities and systemic challenges, I am able to some extent gauge their awareness of how broader systemic structures contribute to the disparities discussed.

A key piece of the analysis hinges on determining if the principals' discourse leans towards an asset-based (i.e., more equity-focused perspective) or a deficit-based (i.e., less equity-focused perspective). An asset-based perspective is characterized by a focus on strengths, potentials, and capacities of students and communities. In contrast, a deficit-based view tends to emphasize what students and communities lack. Recognizing which of these lenses dominates their narratives can provide important insights into their leadership orientation.

Allocating Resources

Research Question 2: How does their conceptualization of equity influence resource allocation decisions?

For research question 2, I focus on codes that provide insight about how principals' understanding of equity influences resource allocation processes. I look for themes related to how principals involve key stakeholders in their resource management process. For example, principals with a higher equity-focused orientation are more welcoming of diverse perspectives

and find value in incorporating these perspectives into their decision- making process for resource allocations. Conversely, principals who have a lower equity-focused orientation will be more likely to use unilateral decision making in resource management practices rather than engage in ongoing, collaborative and inclusive engagement with key stakeholders in their school community (Ishimaru and Galloway, 2014). I use teacher focus group data to provide further insight into how principals involve stakeholders in resource management decisions.

I also look for common themes around how principals use data to inform equitable resource allocation and management decisions. For example, principals with a higher equity-focused orientation use disaggregated data to identify student outcome disparities and actively work to allocate resources to address these disparities. These principals likely also incorporate data from multiple sources and allocate resources in ways that prioritize effective use of data in their school, such as allocating resources for teacher professional development on equitable and effective data use. Conversely, principals who have a lower equity-focused orientation will be more likely to ignore data and instead base resource allocation decisions on personal opinions, values, and assumptions (Ishimaru and Galloway, 2014). The teacher focus group speaks further to how principals allocate resources to promote effective data use among staff.

Findings

The findings show that principals exhibit varying equity-focused orientations in resource management, many emphasizing inclusivity and transparency in involving stakeholders and leveraging diverse metrics for decision-making. While all acknowledge the importance of equitable access to resources, their approaches differ based on school demographics, community characteristics, and personal ideologies. They address student needs by strategically allocating resources, often prioritizing human capital over materials. Some lean towards teacher-centric

methods for involving stakeholders in their allocation decisions, while others emphasize wider community involvement. The utilization of data and strategic resource allocations highlight their commitment to fostering equity, though the complexities of balancing resource allocation approaches with the diverse needs of their student population persist.

The findings section begins with an exploration of how principals conceptualize equity. This subsection highlights the common equity themes shared by principals related to resource access, context, and inclusivity, while also shedding light on some of their more nuanced perspectives around these themes. Following the Conceptualizing Equity subsection, I dive into the first equity-focused driver on how principals frame disparities. This subsection explores the disparities and systemic barrier affecting students' learning from the perspective of principals in the study, while also exploring whether their perspective is more asset or deficit based. The next subsection explores the second part of the first equity-focused driver, focusing on how principals take action through resource allocations. This subsection highlights commonalities and differences in how principals allocate resources that address the student disparities and systemic barriers. The final two major subsections focus on the second and third equity focused drivers. The Construction and Enactment of Leadership subsection explores major themes in how principals involve stakeholders in their resource management process, while the Fostering a Culture of Inquiry and Continuous Improvement subsection how principals facilitate effective data use among their staff and how data informs resource allocation need. These sections speak to how principals conceptualize equity as well as how their equity conceptualization and approach informs resource management practices.

Conceptualizing Equity

Across the cases in this study, common themes emerge in how principals think about equity, including (1) access to resources and opportunity, (2) school and community context, and (3) inclusivity in diverse contexts. All principals recognize that equitable education requires addressing disparities and creating a level playing field for students. However, differences arise in the nuances of their approaches, with some emphasizing community dynamics and external resources, while others prioritize internal diversity and inclusivity. These distinctions reflect the contextual complexity of equity in practice, highlighting the multifaceted nature of educational leadership. While each principal's perspective and priorities are unique, they collectively contribute to our understanding of how equity is conceptualized and pursued within diverse school contexts as well as provide a foundation for understanding how principals allocate resources to improve access and equitable opportunity in their schools. Below, I discuss each of the three common themes that emerged in how principals think about equity.

Access to Resources and Opportunity

The most prominent themes discussed by principals around their conceptualization of equity centered on access to resources and opportunities. Resource availability plays a significant role for Miller, both within the school and in comparison to neighboring districts. She states, "When I think of equity, we're talking about resources as well. So it's what neighboring school districts have access to, as well as what neighboring schools or schools in our district which may not necessarily be in my neighborhood. What programs and resources and supports do they receive?" When Miller envisions equity, it includes comprehensive access and exposure for her students. Critical to her equity perspective is overcoming resource constraints - "I want for my students to not have to be denied anything because of resources." Similarly, Baker's equity

conceptualization centers on access, emphasizing the importance of creating an environment where all students have the necessary tools for success. Wilson's conceptualization of equity is also deeply rooted in the accessibility of resources. She states, "The factors that influence my thoughts about equity are, I guess from an administrator's perspective, access to resources. Funding is a big part of that." Like Miller, access is a key component in her conceptualization of equity.

Smith's conceptualization of equity is also heavily influenced by access. She articulates, "Well, when I'm thinking about my school, it's what are the needs of my families? So how do I make an even playing field for everyone so that we don't have to think about can the kids actually access the instruction because they're worried about other things?" This statement underscores Smith's emphasis on creating an environment where students can focus solely on learning without the burden of external factors affecting their academic experience. Clark's perspective on equity also is rooted in the principle of ensuring that every child, irrespective of their background or personal circumstances, has equal access to resources and opportunities offered by the school. Clark states, "What factors influence my thinking about equity? Just ensuring that every child has equal opportunity for use of whatever I'm purchasing." She emphasizes that each child should equally benefit from school investments.

These principals' core understanding of equity is intricately linked with access to resources and opportunities. Each principal speaks to the importance of leveling the playing field to ensure every student has the tools and support necessary to thrive. This shared vision emphasizes the collective responsibility of educators to eliminate barriers and foster an environment where all students can flourish, regardless of external constraints or circumstances.

School and Community Context

In addition to access, community and school contexts are pivotal in shaping principals' conceptions of equity, with each principal drawing upon unique facets of their school environment to inform their perspective. Starting with Miller, the impact of her immediate surroundings is evident. She highlights how socioeconomic and demographic factors are central to her understanding. Miller states, "The social context of the community as well as the physical location. All of it. The socioeconomics, everything. The racial makeup of the school, the socioeconomic balance in the school as well." By drawing attention to these factors, Miller signifies that equity encompasses a broad understanding of the community's fabric.

Similarly, Smith's equity conceptualization is also informed by the distinct needs of her student population. She mentions, "I have 75% of my kiddos who are ELL kids. I think about that a lot. I think about our low socioeconomic rate." This statement not only highlights the diverse student demographics but also reaffirms the notion that genuine equity considers each student's unique needs and circumstances. Smith's perspective reinforces that equity in education requires understanding and addressing varied student needs, ensuring each one receives tailored support.

Likewise, Wilson introduces a more nuanced dimension by bridging the importance of teacher beliefs with student demographics. Wilson discusses the interplay between educators' ideologies and the student population they serve, posing critical questions about alignment and understanding. She states, "When we talk about equity, also just thinking about teacher beliefs and value systems and the student population, what does the population look like?" Her view of equity is shaped by the beliefs, values, and demographics that define an educational setting. Her

perspective underscores the necessity for educators to align their beliefs with the diverse needs of their student population to foster genuine equity.

Principals' conceptions of equity are deeply influenced by their school and community contexts, with each principal's perspective shaped by distinct aspects of their environment. While Miller emphasizes the role of socioeconomic and demographic factors in her understanding of equity, Smith focuses on the unique needs of her diverse student population, highlighting the importance of individualized support. In contrast, Wilson offers a layered perspective that combines teacher beliefs with student demographics, illustrating the multifaceted nature of equity.

Inclusivity in Diverse Contexts

For Clark, the core of equity is embedded in the tenets of inclusiveness. Her repeated emphasis on the term "inclusiveness" not only reflects its importance but speaks to its foundational role in her understanding of equity. She states, "Inclusiveness. Yeah, just inclusiveness. Everybody being represented and everybody, the inclusivity of everybody and access to all things irregardless of differences." When she speaks of "everybody being represented" and ensuring the "inclusivity of everybody," Clark paints a picture of an educational environment where every student, regardless of their background or differences, is seen, heard, and valued. By highlighting "access to all things," Clark extends the idea of inclusivity beyond just representation to ensuring that every student benefits from the resources and opportunities the school offers, similar to the perspectives of other principals in the study.

More than just a checklist of diversity metrics, for Baker, equity creates an atmosphere where every individual, regardless of their background, feels a deep sense of belonging and connection. She states, "So when I think of equity, I think of meeting the needs of everyone and

making sure that we're providing an environment that is very diversified so that we all function as a family, function as a community." For her, equity is not merely about offering equal opportunities or resources but about fostering interconnectedness, mutual respect, and a shared sense of belonging in her "very diverse school." Her conceptualization highlights the importance of unity and togetherness in a diverse setting.

In examining these principals' perspectives and visions, several commonalities and differences emerge. All principals emphasize, in some form or another, the importance of equitable access to resources and opportunities for their students, underscoring the need to address disparities and create a level playing field. Miller's perspective extends beyond the school walls to consider the influence of neighboring districts, reflecting a broader systemic view of equity. Wilson highlights the role of academic and social preparedness, emphasizing the importance of student readiness in seizing opportunities. Smith's focus on barrier removal positions her as an advocate for equitable access, emphasizing the tangible steps needed to ensure equity. Clark's emphasis on inclusivity and representation underscores a commitment to ensuring that every student, regardless of differences, is part of the equity equation. Baker highlights the diversity within her school community, emphasizing the importance of meeting the needs of all students and staff.

The next sections dive deeper into the equity-focused framework of Ishimaru and Galloway (2014) providing a more nuanced perspective of how principals think about equity and how this thinking informs their resource management process. I first begin with an exploration of the first equity-focused driver, which examines how principals frame disparities and subsequently take action to address these disparities through resource allocation processes.

Framing Disparities

Principals identified multiple systemic barriers influencing students' learning, with poverty being a pervasive issue affecting many facets of school life. They highlight the barriers posed by misconceptions about education, unsupportive home environments, language obstacles, and illiteracy. Their perspectives highlight the importance of recognizing and addressing these multifaceted barriers, tailoring strategies and resources to the unique needs of each student and school community. Below, I discuss these disparities in detail, while also examining whether principals' framing takes on more of an asset or deficit lens.

Pervasive Impact of Poverty

Poverty was a recurring theme, with Clark emphasizing its pervasive impact on their school community. Clark pointed out the challenges stemming from poverty, including single working families. She states, "Poverty, poverty, poverty. I'm at a school with over 90% of free and reduced lunch rate, single working families coming in." Her statement signifies the daily struggles these children face, from hunger to the burden of single-parent households. Clark's emphasis on single working families sheds light on the difficulties these families navigate. With a single parent juggling the dual responsibilities of work and home, children often face the repercussions, which can result in poorer academic performance, mental health, and overall school experience.

Taking the conversation of poverty a step further, Wilson provides a lens into the issue of student homelessness. With 12% of her students being homeless, she highlights a distressing facet of poverty. She states, "We've got a lot of children here, there's about 12% of my population, they're homeless. So we have a lot of kids that are living in a hotel room with three or four other people." The image of children living in overcrowded hotel rooms speaks to more

than just a lack of housing. It alludes to the challenges of poor sleep, inadequate study spaces, and instability that can detrimentally affect a student's capacity to focus, engage, and often, simply to attend school.

Both principals discuss poverty from a systemic level, refraining from blaming students or their families for their dire economic situation. This framing aligns with the equity-focused framework of Ishimaru and Galloway (2014), which emphasizes viewing student barriers in terms of systemic barriers rather than barriers that place blame on individuals. The insights provided by both Clark and Wilson emphasize the profound and pervasive influence of poverty within the school community.

Parental Perceptions and Lack of Educational Support

In addition to poverty, some principals articulated the need to combat misinformation and negative perceptions about the educational system among parents. Miller expressed the challenge of an anti-school mentality in her school community, stating, "The parents don't like school, they don't like teachers, they don't like me. And so we have to combat the anti-school mentality. That's a barrier." This sentiment highlights the importance of addressing misconceptions and fostering a positive view of education.

Baker also touched upon the influence of the home environment, where parents' lack of support can hinder students' success. She mentioned, "I'd say home environment also is a barrier, and just at times, maybe a lack of support from some parents, where kids could really benefit from that," underscoring the role of family dynamics and support structures in shaping students' educational experiences.

The framing of these disparities by both Baker and Miller takes a more deficit-based lens, placing greater blame on parents rather than emphasizing the systemic root causes that may have

led to these barriers. For example, parents may mistrust schools due to a previous poor educational experience in which their educational needs weren't met or their voice wasn't valued.

Language Barriers and Educational Access

While addressing misconceptions and fostering a positive view of education was a common thread among the principals, they also identified shared concerns related to language barriers. Baker identified English language proficiency as a barrier, recognizing the need for additional support in this area, stating, in part, "I think English language is one of our barriers." Baker's discussion on English language proficiency highlights how students with limited English skills often find themselves on the peripheries of the academic environment, struggling not just with the curriculum but also with feelings of social and emotional isolation.

Wilson echoed this concern, explaining that language acquisition is a barrier. She states, "...everything at Bayou now needs to be translated into about 16 different languages, because we've got so many countries represented here now." Wilson's discussion about the need to translate materials into multiple different languages speaks volumes about the multicultural fabric of her school. This rich diversity, while helping to foster understanding and exposure to diverse cultures, also leads to a set of unique challenges. She mentions how district-provided translation services can take a long time to receive.

Similarly, Smith discussed the challenge of language barriers, particularly for parents who do not speak English, she states, "Things like having access to the language and being able to help kids at home with their homework and things. A lot of our parents don't speak English at all, and so it's hard for them to give their children help with homework and things like that." Parents play a cornerstone role in reinforcing their child's education. However, when they

struggle with language barriers themselves, their ability to assist with homework, engage in meaningful dialogue with teachers, or even stay updated on school events becomes significantly compromised. This linguistic disconnect can, in turn, affect a student's overall academic trajectory and their relationship with education.

When discussing these disparities, each principal also spoke to their goal of creating an inclusive educational environment where students and their families, irrespective of their linguistic backgrounds, feel understood, represented, and supported, emphasizing an asset-based and equity-focused view of these disparities. Their discussions also emphasize the need for schools to adopt comprehensive language support systems.

Parental Illiteracy

Similar to the language barrier, illiteracy was identified as an additional barrier, particularly among parents who struggle with reading and literacy in any language. Smith raised concerns about the literacy challenges faced by some families in her school community. She states "The other thing is reading things from us. So communication that we put out. Families need to be able to either read it or we put it out in numerous ways...a chunk of our families don't, aren't literate in any language. So that's also part of an issue that we think a lot about also." This issue extends beyond language barriers and encompasses a broader spectrum of families who may struggle to engage with written communication from the school. Addressing illiteracy becomes an important aspect of ensuring that all families can actively participate in their children's education.

While language barriers are a significant hurdle, the issue of illiteracy delves deeper, affecting a wide range of families irrespective of their linguistic background. Smith took an equity-focused approach to this barrier by finding alternate ways of informing parents of school

information, such as parent meetings. She understood how parents being unable to engage with written communication from the school inadvertently prevented them from being fully involved in their children's education. The resources discussed in the next section speak to strategies for ensuring every family feels connected and empowered.

In their quest for educational equity, these school leaders grapple with many challenges that stem from broader societal issues. These challenges are not just academic but also deeply entrenched in the socio-economic and cultural fabric of the communities they serve. The principals in the study emphasize the multitude of barriers students face in their educational journey, from poverty to misconceptions about education, and from linguistic hurdles to the barrier of illiteracy. The next section speaks to the necessity of not just identifying problems but sculpting solutions through resource allocations that address the diverse needs of every student.

Taking Action through Resource Allocations

Examining principal resource allocations provides insight into principals' dedication to enhancing equity within their educational environment. Recognizing both the linguistic and socioeconomic challenges their students face, these school leaders strategically allocate resources, whether through hiring specialized personnel or ensuring availability of essential supplies, to bridge gaps and foster inclusivity. It's evident that for several of these principals, promoting equity goes beyond academics; it involves understanding and addressing the multifaceted needs of students and their families, both within and outside the school environment. This holistic view helps provide students with an environment conducive to learning and growth. Below, I discuss the common resource allocation themes influenced by principals' equity conceptualizations as well as the disparities discussed in prior sections.

Strategically Allocating Personnel Resources

Strategic personnel allocation emerges as a common theme among the principals in this study, underscoring its pivotal role in advancing equity within their schools. Smith's prioritization of people over material resources reflects a broader perspective on equity. Smith states, "I just put a higher emphasis on people usually than I do the stuff." She consciously places a higher emphasis on human capital, indicating a commitment to investing in the expertise and support required to drive positive outcomes for students. Similarly, Baker states, "I believe in people. I believe in personnel first. So do we have the right people in place? Do we have the right resources in place? And then once that is determined, then what kind of hands-on consumable products do we need?" This approach resonates with an equity-focused orientation that values the role of educators and support staff in promoting student success.

Recognizing that students come to school with diverse backgrounds and varied challenges, Smith has taken a holistic approach to ensuring every child has an equal opportunity to thrive academically. Smith emphasized the value of personalized support systems tailored to the individual needs of her students. Smith discussed allocating resources to dedicated personnel, including English Language (EL) coaches and teachers as well as interventionists and counselors, to promote an equitable learning environment. She states, "So we have an EL coach, and we have an EL teacher at every grade level that co-teaches with all of the teachers, usually during the ELA block. So every teacher has an EL teacher co-teaching with them for at least an hour a day, if not more. We have counselors, social worker, behaviorally that can work on things. We have tier two, tier three interventionists." Smith's emphasis on tailored support systems and the comprehensive array of personnel resources available in her school reflects the multi-dimensional approach required to promote equitable instruction effectively.

Similarly, Baker states, “I mean, we’re 60% EL population, 60% Latino, so we want to make sure that we have the right people, the right tools in place for our students that are English learners, and to make sure that they have as much access and success within academic standards that any other student does. So that’s through personnel, EL teachers that serve grade levels.” Her emphasis on having “the right people, the right tools in place” is indicative of a strategic approach aimed at addressing the needs of English learners and ensuring their academic success. This perspective aligns with an equity-focused orientation, as it recognizes the importance of targeted personnel to meet the unique needs of a predominantly ELL and Latino student population.

Likewise, Clark’s allocation of resources toward hiring additional staff members helps further her commitment to equitable access to quality education for her students. She states, “I have to make the class sizes smaller. To make it more equitable for students to have more access to teaching and learning, I’ve paid for teachers out of some of my money.” One teacher spoke to this, when she shared, “We have the extra funding that she uses to make sure that we have two EL teachers. To make sure that we have three classroom teachers so that we don’t have to sit students on top of each other and continue to have discipline issues.” By hiring additional personnel, she helps ensure that students have the necessary support and resources to succeed. This strategy aligns with an equity-focused orientation, as it directly addresses barriers that hinder student learning and achievement.

Miller’s allocation of resources towards support staff, including full-time tutors and instructional coaches, reflects a comprehensive approach to addressing barriers and improving equity in education. She states, “I try to also think of what staff would best serve our students. What staff would best serve our students. So I’ve added two tutors, full-time tutors this school

year...I also have an instructional coach and an instructional specialist... The instructional coach actually works with just teachers... Helping to make sure... they're teaching the lessons as they're designed to be taught." By adding support staff, Miller aims to provide targeted assistance and resources to students who require additional support, which is in line with an equity-focused orientation. Miller employs instructional coaches to ensure consistent teaching practices and emphasizes the importance of effective instruction in promoting equity. However, the focus on one uniform way of teaching could limit students who may need more tailored instruction or learn better in different formats.

Miller not only focuses on academic support in her resource allocation decisions, she also addresses the students' emotional and mental well-being. As one teacher shared, "We have more staff this year to help with students' emotional wellbeing, like an extra guidance counselor. So we have three now, instead of two. All of the support teachers… and our restorative teacher, they're all involved in social emotional aspects of student wellbeing. And our social worker is more present." Addressing emotional well-being is important for ensuring students are receptive and responsive to academic instruction. By integrating these support personnel into her resource allocation strategy, it is clear that Miller recognizes the connection between emotional health and academic success, further speaking to her equity-focused orientation.

Similarly, Smith has taken a holistic approach to ensuring every child has an equal opportunity to thrive academically. The hiring of advocacy center personnel speaks to Smith's comprehensive approach to addressing student needs. This center, staffed by a trauma-informed professional, is designed to address many challenges that might impede a student's ability to focus and learn. As highlighted by a teacher, "She did add an advocacy center to our school, which is someone who is trauma informed, so they help kids regulate and just kind of narrow

down what's maybe making them dysregulated, or maybe it's just as basic as, 'I didn't get much sleep today, and I'm tired,' or 'I'm hungry, so I can't focus on what I'm doing.'" This strategic allocation suggests that Smith understands that to truly level the playing field for her students, she must look beyond the curriculum and address the whole student.

Baker and Clark also hire additional support staff to better meet the needs of their school community. Baker states, "We do personnel. We have a family resource center who... It's housed by a person. We also have a family engagement specialist. So we have two paid positions that are specifically reaching out to parents and encouraging them... They're engaged on what strategies can we give our parents to help them interact with their student and be successful academically." These positions are dedicated to building bridges between parents and the school, emphasizing the importance of a collaborative approach to enhance student success. By actively engaging parents and equipping them with strategies for academic involvement, Baker's approach acknowledges that equity in education goes beyond classroom instruction; it encompasses the entire school community.

Similarly, Clark's allocation of resources for a full-time translator reinforces her commitment to equity. Clark states, "I hire additional staff members. I have paid for a translator to be in the building full time." Corroborating this point, one teacher shared, "We have a full-time translator. We translate all of our materials that go home to families." This strategic decision directly addresses language barriers that may hinder students' access to educational opportunities. By ensuring that translation services are readily available, Clark removes a significant systemic barrier, thus aligning with the equity-focused orientation. Their resource allocation decisions reflect a shared dedication to addressing disparities and promoting equitable outcomes within their schools.

The strategic allocation of personnel and support staff resources across these principals' schools is rooted in a shared commitment to equity. Their resource allocation practices reflect an understanding of the unique needs of their student populations and a proactive approach to address disparities in access and opportunity. Whether through targeted personnel, reducing class sizes, or enhancing family engagement, these principals demonstrate an equity-focused orientation in their resource allocation strategies, aligning with the framework of Ishimaru and Galloway (2014).

Holistic Non-Personnel Allocations for Student Well-Being

Similar to personnel allocations, non-personnel allocations play an important role in ensuring that students have access to essential supplies and materials to enhance their learning experience. For example, Miller allocates funds for instructional supplies that cater to students' diverse needs. Miller states, "I do put a little bit in instructional supplies, because some teachers will want things like squeeze toys, pop its, those chair bands to help kids who are a little anxious... So we have money for that." By earmarking resources for these instructional supplies, Miller takes a proactive approach to support students' social and emotional well-being, thus aligning with an equity-focused orientation that considers the broader context of students' needs.

All principals' resource allocations extend beyond the classroom, encompassing initiatives that address basic necessities for students and their families. Clark states, "...we help families with transportation, clothing, housing, food, hey, whatever it takes, to get kids ready to be able to access academic content. If you're hungry, you don't care about learning to read." Clark's commitment to addressing students' basic necessities reflects an understanding that external challenges can profoundly impact students' ability to engage effectively with academic content. Likewise, Wilson, Smith, Baker, and Miller take a similar approach to addressing

student needs. Teachers at the schools of Wilson, Smith, and Baker all spoke to similar resources at their school. For example, Smith's teacher highlighted, "And we accommodate their needs. We have meals go home on weekends and weekdays for students to accommodate…Clothing, food, shoes, school supplies..." Similarly, Miller states, "We send home food bags every weekend with the kids whose parents requested them at the beginning of the year... So we send those home to help with sustenance. We have some clothes, a clothing closet for kids...." By ensuring students have access to food, clothing, and other necessities, these principals address barriers outside the school walls that may affect students' readiness to learn, reinforcing the idea that for students to excel academically, their basic needs must first be addressed. This holistic approach aligns with the equity-focused framework, highlighting that equity-focused principals prioritize both the academic and personal well-being of their students.

Miller also takes a community wide approach with her non-personnel allocations. Her establishment of a community refrigerator stocked with perishable items offers a tangible solution to address food insecurity. This resource is accessible to anyone in need, highlighting a community-centered approach to resource allocation. She states,

> And we just keep resources. We have a community refrigerator that we use resources for, that anyone can use. Anyone. And we have perishable items in there...Those types of things that refrigerate, where folks can just come and grab what they need, eggs, that sort of thing. So those are definite barriers when you think about hunger and just being without. We know how it impacts children's minds. I guess it does help. I just see it as this is what you do. You see people in need, you meet those needs.

Miller's approach emphasizes the importance of systemic responses to disparities. By providing these basic necessities, Miller works to create an inclusive educational environment where students can focus on their academic pursuits without the burden of unmet essential needs.

Equitable resource allocation involves understanding and addressing the broader spectrum of challenges students face, both within and outside the school walls. Whether it's equipping classrooms with tools that cater to students' emotional needs or addressing fundamental necessities like food and clothing, principals in this study demonstrate an equity-focused, student and community-centric approach. Their strategies emphasize that for students to truly thrive academically, their basic and socioemotional needs must be met, highlighting the relationship between well-being and learning.

Equity-Focused Capacity Building Allocations

In addition to personnel and non-personnel allocations, equity focused leaders allocate resources to develop the capacity of their teachers around equitable school practices, ensuring that teachers have the skills needed to foster an equitable school environment. Miller, for example, allocates part of her budget for external teacher conferences. She states, "... I had sent a group of folks to a conference in Chicago a couple of months back. And they had a track on teaching and poverty. So they got to go and learn, and bring back some information on that. And we do it. We have PLCs at school. We have a new teacher PLC, faculty PLC, where we discuss these issues and share strategies." Miller's stance towards professional development, including external conferences and internal PLCs, reflects a multifaceted approach to addressing equity-related challenges within her school, fostering an environment where both educators and students can thrive.

Similarly, Wilson allocates resources to provide school-level equity-focused professional development on recognizing microaggressions and attending to each student's unique needs. Wilson emphasizes, "I've done professional development on equity and microaggression here at the school...helping them understand that when we look at a child, we must see the whole child and be intentional about providing support." Corroborating this commitment to equity, a teacher during a focus group shared, "Equity is one of our core values as a building and access… It's not just lip service. We all went to a PD this summer. We live it here…" This statement underscores that Wilson's dedication to equity is deeply embedded in the school culture and isn't just a top-down directive. Wilson's proactive approach in addressing microaggressions and fostering equity through professional development mirrors an asset-based perspective. Rather than adopting a deficit orientation, she highlights the importance of understanding and supporting the whole child to ensure equitable outcomes for every student in her school community.

In addition to the broader equity-focused professional development, Wilson also focuses on more tailored equity-focused capacity building resources that address the specific needs of her EL students. As one teacher from the school shared, "Because it was such an issue with our ELs and we got such large numbers, now we're doing school-wide ELPD." Another teacher pointed out, "So two more of us got certified last year that teach math. And that's really unheard of to have EL teachers in the math department." These comments highlight Wilson's work to provide specialized resources and training to ensure that every segment of her student population, particularly those with language or other barriers, receive the tailored support they require. The intentional investments in EL-focused professional development and diversifying the expertise of the EL teaching staff demonstrate her comprehensive approach in fostering equity through her resource allocations.

Other principals, however, choose not to use their school-level budgets for providing equity-focused resources for their teachers, instead choosing to rely solely on district-level resources. Smith, Baker and Clark are not as intentional as the prior principals about ensuring that their teachers have access to equity and diversity resources beyond district-level trainings. A teacher from Smith's school commented, "There's not been, honestly, I think, a whole lot of resources...you can do a lot of PD in the district on your own if you go and research it, but just from our school specifically, the principal doesn't say, 'This is opportunities for development.'" This statement suggests that Smith is not as equity-focused or purposeful as the prior principals in terms of building teachers' capacity around equity-focused practices and awareness.

Similarly, Baker states, "Yeah, I think the district offers some opportunities to learn more through that...As we learned the curriculum this school year, there are lots of discussions of making it equitable, making it accessible to all students, and making sure we're providing the resources that those students need to be successful. And then we also do implicit bias training and try to help our staff be aware of their biases." Clark also highlights district initiatives to "look at diversity and equity." While these principals acknowledge the district's efforts in promoting equity and addressing biases, their reliance on these broader initiatives suggests a potential missed opportunity at the school level. By not leveraging their school-level budgets to supplement these district-wide resources, there might be nuances and specific needs of their unique student populations that remain unaddressed. Hence, while district initiatives are important, school-specific interventions can further refine and tailor these efforts, ensuring a more targeted approach to equity and inclusivity.

The allocation of resources, specifically around developing teachers' awareness of bias and equitable teaching practices, varies significantly among principals. Miller and Wilson

demonstrate a proactive, school-centric approach, investing in more tailored professional development opportunities that directly address the unique challenges within their school communities, which not only provides teachers with beneficial knowledge and development but also enhances the learning experience for students. Conversely, relying solely on district-wide initiatives, as seen with Smith, Baker, and Clark, may not always be sufficient to meet the diverse needs of individual school populations. Principals who are more equity focused may be more intentional about leveraging both district-wide and school-specific resources to develop their teachers' capacity around equity-focused understanding and practices.

While principals' selection of resources provides insight into their equity-focused orientation, understanding how they collaborate and make space for other stakeholders in the school environment also provides important insights. The next section focuses on the second driver of equity-focused leadership, construction and enactment of leadership, highlighting how principals include others in their decision-making process, with particular focus on the resource management process.

Construction and Enactment of Leadership

Principals varied in their approach to involving stakeholders in the resource allocation process, with some emphasizing a holistic representation of multiple key stakeholders while others focused more on a teacher-centric approach. Overall, principals emphasized collaborative decision-making, transparency, and equity, engaging a variety of stakeholders ranging from teachers to parents and community members. This multi-stakeholder engagement by several of the principals not only aids in resource allocation but also fosters a collective sense of ownership and responsibility, promoting a more equitable school environment. Below, I discuss the major themes in how principals involve stakeholders in their resource management process.

Teacher-Centric Stakeholder Involvement

Baker places a strong emphasis on a holistic representation of the school community when it comes to making resource allocation decisions. “Our leadership team has a representative from every grade level and from every area within the school building,” she states. The diverse composition of this team, which includes “teachers, admin, coaches, counselors,” ensures that each sector of the school community has a voice at the table. Each member serves as a vital link. She states, “...And then they go to their teams, get feedback on certain topics, certain thoughts within budgets, and then bring that back to the team to discuss and make decisions on how we move forward.” One of the teachers praised Baker’s approach by saying, “...when coming up with the budget, he’s really great about listening to staff feedback and us really, we wanted to keep the number of EL support teachers that we had… and he really worked hard to make sure that we could fund that, fund another position for that.” Baker’s approach fosters a sense of responsibility among team members, where they meet regularly to discuss budgets and resources. After these discussions, they engage with their respective teams to get feedback on suggested resource allocations, and then reconvene to incorporate this feedback into actionable decisions. This iterative process accentuates Baker’s commitment to an inclusive and transparent decision-making process.

Wilson also incorporates teacher feedback in her resource management process. She actively seeks their opinions and insights when making resource-related decisions, ensuring they feel valued and integral to the school’s operational strategy. She states, “... I always ask for [teachers’] feedback. What do you think about this? Do you think that we need to spend more money on technology or software applications? What are your thoughts?” Unlike Baker, however, Wilson does not practice a highly distributed leadership style in her resource

management process. She mentions how she "caters" the feedback from teaching staff based on "very specific skills." She believes that certain teachers are particularly knowledgeable about "skills-based needs and the standards based needs" of students and, therefore, better equipped to help in the resource management process. Further emphasizing this point, one teacher states, "we're all involved... we're all on one of the committees that's going to push for some resource or discuss the funding that happens." Further corroborating this, another teacher adds, "Yeah. Either instructional leadership or school leadership or something." These teachers, as leadership team members, occupy a position of trust and credibility for Wilson, which gave them a voice in the resource allocation process. However, this approach ignores the voice of many other key stakeholders and could be considered a more deficit-based view of the capabilities of her staff, falling short of a more equity-focused orientation.

These principals adopt a teacher-centric approach to resource management, representing varying levels of equity-focused orientation. Wilson's orientation to involving stakeholders in a more concentrated approach, and more exclusionary approach, is less equity-focused than that of Baker, who actively, though indirectly, incorporates the feedback from all teachers in his school. While the teacher-centric approach does emphasize a certain degree of equity, a more comprehensive equity-focused approach actively involves a broader range of key stakeholders, including parents, students, and community members.

Multiple Stakeholder Collaboration

Other principals in the study place a stronger emphasis on a collaborative approach to resource allocation, actively involving multiple stakeholders, both within and outside of the school building, in the resource allocation process. Miller states, "I usually send a survey to my parents just saying, 'What types of things would you like to see us have?'... And I give parents a

parent-friendly copy of the budget so they can see where funds typically go." She actively tries to make the budgeting process transparent and accessible to parents, who have more limited knowledge of how school budgets operate, demonstrating an equity-focused approach to involving stakeholders. Her more distributed leadership style is evident as she seeks feedback not just from parents but also from other key stakeholders, she states, "So I survey our parents, the leadership team. I've had parents actually come to the leadership team while we discuss that." Miller's efforts to incorporate diverse viewpoints also extend to students, as she says, "Students, we've had focus groups. One of the deans held focus groups with a few of the kids to just see, 'Okay, what kinds of things do you want to see at your school to help us figure out what types of things we need to do?' "Miller's comprehensive and inclusive approach ensures that all voices within the school community are heard, fostering a sense of collective ownership and responsibility in the resource allocation process.

Smith's approach to resource allocation is similarly inclusive, emphasizing collaboration among different stakeholders. Her initial discussions center around the leadership team, which comprises members from various school sections. She explains, "We include first the leadership team, so that is a member of each grade level and then extras like our instructional coaches and an EE representative and an EL representative. There's 11, there's 12 of us on the leadership team." One teacher, reflecting on their involvement in this collaborative process, shared, "This is my first year on our Building Leadership team, but from what I've seen so far, she typically asks that team first, and then we go back and ask our teams and then provide a ton of feedback to them for decision-making and stuff like that, for stuff that our students need and that we need. Then, there's that dialogue back and forth." Another teacher further illustrated the participatory nature of this process, noting, "And a specific example was, in our last Building Leadership

meeting, she asked us to ask our teams what professional development we all wanted as she starts to plan next semester, and so then that was nice to have input and ask everyone on our teams to really think about what we wanted to learn as a school." These comments speak to the collaborative approach Smith uses in her resource allocation process.

Smith's collaborative approach extends beyond this core group. She shares, "...all those leaders went back to their groups, their grade levels, their teachers that they're representing, and said, 'Does this look right? Are there things that you guys can think of that we haven't?' And so ultimately, all of them are, all the teachers are involved in that and support staff." Parents also play a role in Smith's collaborative approach to resource management, as she details, "[Parents] are included in our, what's called our milestone meetings and in budget title meetings, so they get to give input on kind of what we decide and tell us, you know, we'd like to see this, that, and the other thing." By incorporating insights from various school stakeholders, Smith ensures a comprehensive and holistic approach to resource allocation that genuinely reflects the needs and aspirations of the entire school community.

Clark's strategy is also rooted in community involvement, starting with her building leadership team, and expanding to incorporate other faculty, staff, parents, and even community representatives. One teacher shared, "When it's time for the budget time, she says, 'This is what I have. What do you guys want? Do we vote? Do we want this teacher… Do we want this? Do we want that? Take a vote, let us know.'" This direct involvement of the school community in the resource allocation process not only exemplifies transparency but also fosters a sense of collective ownership among the stakeholders. Building on this idea, Clark states, "And it starts initially with my building leadership team. And then we do share things with the overall faculty and staff members getting input. And then we also get input from families, from parents. We

have a couple of parents that sit on the budget group with us to help with that." Clark's emphasis on a holistic representation is also evident when she mentions collaborations with community partners, stating, "Oh, some community people because I have a representative from Boys and Girls Club..." Together, these insights speak to Clark's commitment to fostering an inclusive and collaborative environment as well as highlights her highly equity-focused orientation for this driver.

Each of these principals, Miller, Smith, and Clark, underscore the importance of distributed leadership and collaborative decision-making in the resource allocation process, actively involving multiple key stakeholders from teachers to students, parents, and even community members. Their construction and enactment of leadership suggests a strong equity-focused orientation when involving key stakeholders.

Building on the principles of distributed leadership and collaboration, the next section discusses how principals foster a school culture that prioritizes inquiry and continuous improvement. By harnessing the collective insights of all stakeholders and promoting an environment of inquiry and improvement, principals can not only allocate resources more equitably but also consistently evolve to meet the changing needs of their school community.

Fostering a Culture of Inquiry and Continuous improvement

Principals in the study demonstrate varied yet strategic approaches in utilizing data to inform resource allocation decisions in their schools. By leveraging behavioral, disciplinary, assessment, and attendance data, these school leaders identify specific needs and areas of improvement, leading to targeted actions such as hiring specific staff or introducing new programs. This commitment to data-driven decision-making not only reflects their dedication to improving student outcomes but also highlights their equity-focused orientation in fostering a

culture of inquiry and continuous enhancement. Below, I discuss how principals facilitate effective data use among their staff and how data informs resource allocation need.

Facilitating Effective Data Use

To facilitate effective data use among staff, the principals demonstrated a variety of approaches, often allocating resources to ensure effective data use. Miller emphasizes the importance of tailoring resource allocation to the specific needs and skill sets of their staff. Recognizing the generational divide in technological proficiency among faculty members, Miller allocates resources to hire a data coach who can assist the teachers who are less tech-savvy. As Miller states, "...older folks like me can figure things out, but these young folks are really [technically proficient]...I was able to purchase a data coach who actually mines the data for me so I don't have to go in and dig it up. If she sends me exactly what I need and I can look at the data and determine, 'Okay, these are our next steps. This is what we need.'" Through strategic resource management and recognizing the diverse skills of staff, Miller ensures that every teacher, including herself, has the necessary support to effectively use data.

Similarly, Baker places a strong emphasis on providing training opportunities for staff members to use data more efficiently. He states, "We have a data specialist who will work with grade level teams in order to break down data, to organize data to be able to understand what it's saying." Additionally, Baker's approach includes administrative meetings with individual teachers to ensure alignment and understanding of student needs through data analysis. One teacher speaks to these meetings, "We have data team meetings where we discuss the data we gain from students to see what supports we need to give them or to pull back on supports." Such practices ensure that every student receives the necessary attention and resources, which aligns with Baker's equity-focused approach.

Wilson adopts a unique approach to build staff capacity for effective data analysis. Wilson introduced a structured program from Harvard called Data Wise, which emphasizes not only examining data percentages but also understanding the underlying actions and circumstances that shape the data trends. She noted, “A lot of times what happens is your surface is just looking at the percentages and numbers, but you need to look at how did that percentage come about? What was the actual action, what caused the data to look this way?” In contrast to her counterparts, Wilson appears to prioritize cultivating the analytical capacities of her team members, fostering an environment wherein individuals are adept at utilizing data effectively. She has a strong equity-focused orientation to creating a culture of inquiry and continuous improvement among her staff.

Smith underscores the importance of regular data review through structured data meetings. These meetings serve as forums for analyzing various assessment results and determining appropriate tier-level placements for students. Smith’s approach showcases a commitment to data-driven decision-making and regular engagement with data throughout the school community. According to Smith, “We have data meetings once every five weeks to look over both formative and summative assessment results... all of those [meetings] use data to inform what we do and how we do it.” Smith also employs a data specialist that provides professional development to staff frequently. One teacher expounded on this by saying, “One big thing is she pays separately for a data person to come to our school to do lots of planning and teaching. She stays with our school throughout the year, and will regularly come and give us guidance on that.” This emphasizes Smith’s investment in continuous data support and training for her staff, indicating a more equity-focused orientation.

Clark uses a multifaceted strategy that includes both the provision of resources and policy development. By creating data binders for students and teachers and modeling data chats, Clark ensures that the entire school community has the necessary tools and clear expectations for effective data utilization. This approach signifies an investment in tangible resources and a clear communication of data-related expectations. Clark states, “We made student data binders to do data chats, but we also modeled that by us doing data chats with teachers. So we made them data binders and bought all the resources to put in that to show them what we expected when they did it with kids.” Several teachers make reference to the data binders, with one saying, “We’ve used money to buy data binders for the kids, so that directly affects them. Then they can keep up with their own data and so they’re being more responsible with their academics, where they want to go and what they want to do.” This sentiment is further reinforced by comments highlighting the emphasis on data, such as “There is money and time spent to make sure that we are looking at the data,” and “The word data in our building is not an adult word. It’s a school-wide word.” These narratives from the teachers highlight the integral role of data in the school’s culture and decision-making processes. By facilitating the effective use of data school-wide, Clark not only elevates teachers’ capacities but also empowers students to take ownership of their educational journey, illustrating a holistic commitment to fostering a culture of inquiry and continuous improvement.

In comparing and contrasting these approaches, it becomes evident that while Smith, Miller, and Baker allocate resources towards hiring data specialists or coaches to assist with data analysis, Wilson invests her own time and expertise to teach staff how to effectively analyze data. Wilson’s approach places a strong emphasis on building staff capacity and data literacy. On the other hand, Clark’s strategy encompasses a broader spectrum of resource allocation,

including materials, policy development, and modeling, illustrating a comprehensive commitment to nurturing a culture of data inquiry.

Using Data to Inform Resource Allocation Need

Principals utilize various types of data, including behavioral, disciplinary, assessment, and attendance metrics, to inform the resource allocation process in their schools. Miller states, "So we look at assessment data. We look at behavior data. We look at attendance data. What do we need to do? Do we need to get our social worker because we have one for half the week. Do I need to purchase an additional day?" Adding to this narrative of transparent data utilization, one teacher commented, "But she has been very open and honest about attendances and tardies, with both the parents and the staff. And so that has been blasted out in emails and also in her morning talks, via video, where she is addressing those concerns." Another teacher shared similar sentiments, highlighting the value of this open communication, "She seems to be very open and honest and very direct... I like the fact that she will just share data and then we'll have a conversation about it. So I feel that she's very transparent." These statements underscore the importance of not just leveraging data in decision-making but also ensuring that stakeholders understand and engage with this information in a meaningful manner. Such transparent communication fosters trust and collaboration within the school community, reinforcing the idea that data-driven decisions are rooted in the collective best interests and fostering an equity-focused environment.

Consistent with this multi-faceted approach, Wilson states, "Now that's all I do is use the data. I can't use anything else... I don't make any decisions based on how I feel...So there's attendance, there's discipline, there's teacher effect data, quality index data about the programs...What do we not measure?" Reinforcing this perspective, a teacher highlighted

Wilson's transparent approach, noting, "She is very transparent with the data, shares it with us, allows us to self-interpret and then gives the big picture. She lets us set goals, aids us in the process of setting those goals, but then also lays out her expectations of what she wants." This inclusive and clear method of communicating about data highlights Wilson's commitment to empowering her staff while also providing guidance and direction.

Similarly, Clark described using data to identify which supports and interventions the school needs. She states, "Even when teachers, certain things that they want to buy, it's like, 'Well, okay, well how do you justify that?' And we look at our numbers, what do the numbers say we need?" By asking teachers to justify their requests with data, she ensures that resources are allocated where they are most needed. This approach not only streamlines resource management but also establishes a culture of inquiry and fosters an environment of continuous improvement.

For both Clark and Miller, data enables them to implement a more targeted approach to addressing student needs. Clark describes how demographic and assessment data led to hiring a translator and adding math supports. She states, "That's how we ended up coming up with saying we needed to pay for a full-time translator because our Hispanic Latino population is over 60% of our overall school population...we got a math coach for the last two years because our math scores had tanked. So we used data, it drives everything that we do." Miller also provides an example of using data to identify an area need and drive relevant resource allocation decisions, this time via disciplinary data. She states, "For instance, if... discipline is really bad. Do we need to buy a dean of students who just focuses on proactive discipline, not just reactive discipline?"

The principals emphasize the importance of leveraging behavioral, disciplinary, assessment, and attendance data to make informed resource allocation decisions in their schools.

These data-driven approaches help in identifying specific needs, such as the hiring of a translator due to demographic changes or the introduction of a math coach in response to declining math scores. Such strategies speak to an equity-focused orientation that cultivates inquiry and continuous improvement through data use.

Discussion

The principal and teacher accounts show that a spectrum exists when it comes to equity-focused drivers in the resource management process. While each principal vocalized a similar conceptualization of equity, the ways in which they framed disparities, took action to address disparities, involved stakeholders, and created a culture of inquiry varied. Some principals were highly equity-focused in some areas while less equity-focused in other areas relative to other principals in the study. This finding underscores how equity in practice is complex and multifaceted.

School principals' conceptualizations of equity centered around a few key themes. Principals all expressed that equitable access to resources and opportunities is a key tenet of their equity conceptualization. The perspectives range from considering the availability of resources within the school and in neighboring districts to ensuring that students are not deprived of anything because of resource constraints. Principals also draw from the unique characteristics of their school and community to shape their understanding of equity. Factors such as socioeconomic status, racial makeup, student demographics, and educators' ideologies play pivotal roles in how equity is perceived. Several principals emphasized the need for an inclusive environment that caters to the needs of every student irrespective of their background or differences. For some, this means creating an atmosphere of interconnectedness and mutual respect, ensuring that every individual feels a sense of belonging and support.

The equity-focused orientation of the principals is evident when framing disparities. Instead of approaching issues from a deficit perspective, many of the principals adopt an asset-based and systemic lens when considering the challenges faced by their school communities. This approach aligns with the equity-focused framework of Ishimaru and Galloway (2014), which centers on recognizing and addressing systemic barriers rather than attributing disparities to individual shortcomings. For instance, while poverty emerges as a significant concern, principals discuss its ramifications without placing blame on students or their families. They articulate the broader challenges that stem from socioeconomic issues, such as the daily struggles faced by children from single-parent households or those living in transient conditions like hotels. Language barriers and parental illiteracy characterize other systemic barriers. Instead of viewing these challenges as deficiencies in the students or their families, the principals underscore the necessity for schools to adapt and provide comprehensive support systems. However, it's worth noting that while many principals embraced an equity-focused lens, some perspectives, such as those highlighting parental mistrust or lack of support, risk veering into a deficit-based approach. These instances highlight the complexities of equity work, with leaders striving to balance understanding systemic issues with the immediate challenges they confront daily.

Emphasizing the significance of both linguistic and socioeconomic factors, these principals strategically allocate resources to bridge gaps in education and foster an inclusive environment. Their focus is not just on academics but also on understanding and catering to the holistic needs of their students and their families. The findings highlight the importance of strategic personnel allocation, where principals prioritize human capital over material resources to support positive outcomes for their students. Although many principals prioritized personnel

allocations, all principals adopt a holistic approach that encompasses both academic and non-academic needs, from specialized teaching staff to essential resources such as food and clothing. Additionally, some principals are intentional and proactive in allocating resources to equity-oriented capacity-building of their teachers at the school-level, while others rely on broader district-led initiatives.

Similar to the variation in selected resource allocations, principals also vary in their strategies for stakeholder involvement, with some leaning towards a teacher-centric methodology, while others embrace a broader, equity-focused inclusion of various school community members. Within the teacher-centric model, there are nuances with one approach ensuring representation from all teaching departments, fostering inclusivity and transparency, while another tends to focus on teachers with specific skills, potentially overlooking broader stakeholder insights. In addition to teachers, more equity-focused principals, however, involve a variety of stakeholders in the resource allocation process, including students, parents, and community members. These leaders prioritize transparency and inclusivity, ensuring that diverse perspectives are considered in the decision-making process. This approach, anchored in the principles of distributed leadership, embodies the core tenets of the equity-focused framework. The emphasis on collective ownership and collaboration in resource allocation underscores the essence of equity-focused leaders.

All principals in the study use a strategic, data-driven approach to inform resource allocations, focusing on a diverse set of metrics to address school needs. Through various methods, from hiring data specialists to facilitating training programs, they cultivate an equity-focused culture of continuous inquiry and improvement. The transparent communication style of

many of the principals ensures inclusive stakeholder involvement, fostering trust and collaboration within the school community.

Implications

Given the findings on the varied equity-focused resource management practices among principals, there are important implications for both policy directives and the redesign of principal preparation programs to better serve the evolving landscape of educational leadership and the diverse needs of students. The findings suggest policy initiatives should move beyond just advocating for equity as a conceptual ideal but rather should provide clearer guidelines and structures on how to practically achieve equity goals, taking into account, for example, the varying interpretations of equity as gleaned from the principal accounts. It is also vital for policies to embrace an asset-based perspective, like that described in the equity-focused framework of Ishimaru and Galloway (2014). This involves recognizing systemic barriers and addressing them head-on, rather than placing the onus on individual students or families. Given the varying strategies for stakeholder involvement, it would be beneficial to enact policies that mandate the inclusion of diverse stakeholders. Such a policy would ensure that various perspectives are always considered, aligning with the tenets of the equity-focused framework. Additionally, given the strategic allocation of resources highlighted by principals, policies should afford schools more flexibility in resource allocation, while emphasizing the need for transparency and the inclusion of varied stakeholder perspectives in decision-making processes.

The insights from the study can also inform principal preparation program updates. A clear takeaway is that theoretical understandings of equity are not enough; aspiring principals need to be trained in the practical intricacies of implementing equity-driven decisions in diverse school contexts. To ensure a unified and deep-rooted understanding of equity, preparation

programs should embed experiential learning opportunities, such as case studies or simulations, that allow future principals to grapple with real-world scenarios of resource allocation and stakeholder engagement. Given the emphasis on holistic student needs, training should also focus on cultivating a broadened perspective of student success, encompassing not just academic outcomes, but the overall well-being of students. Training modules on effective stakeholder engagement, drawing from the principles of distributed leadership, can also be pivotal. The findings also point to the importance of data-driven decision-making in resource allocation and equity initiatives. Thus, principal preparation programs should incorporate rigorous training on data analytics, interpretation, and transparent communication to various stakeholders.

Conclusion

The principal and teacher narratives shed light on the multifaceted nature of equity-focused resource management. Although a shared conceptualization of equity emerges – one that primarily revolves around equal access to resources and opportunities – the nuances in its implementation differ across cases. Equity in the resource allocation process takes many forms to meet the diverse needs of students. What remains consistent across principals, however, is their desire to provide equitable access and opportunity to all students. To truly foster equity in schools, both policies and training frameworks must evolve, emphasizing not just theoretical understandings but practical implementation strategies that consider the diverse needs and complexities inherent in today's educational landscape.

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Tables

Table 3-1. Principal Characteristics

Pseudonym	Tier	School	Years as Principal	Total Years in Education	Prior Budgeting Experience
Baker	ES	Magnolia Elementary School	3	14	Yes
Miller	ES	River Oaks Elementary School	4	22	No
Wilson	MS	Bayou Middle School	15	20+	Yes
Clark	ES	Greenway Elementary School	16	33	Yes
Smith	ES	Lakeland Elementary School	20	35	No

Appendix A: Semi-Structured Principal Interview Protocol (First Interview)

Principal Background

1. Can you tell me about your professional background and your experience as a principal?
    a. Years in current school
    b. Total years as principal
    c. Prior professional roles in the education system (e.g. teacher, counselor, etc)

Resource Allocation Decision-Making Process

2. Can you tell me about your prior experience with school resource allocation decision making?
3. Can you give an overview of your current decision-making process for discretionary budget allocation?
    a. What is your philosophy or approach to resource allocation?
    b. How do school and student characteristics influence decision making?
    c. How do you determine which categories to prioritize?
    d. How do you choose between staff and non-staff expenses?
4. In what ways, does evidence-based research inform your resource allocation decisions?

Student-Based Budgeting

5. How do you define student-based budgeting?
6. What type of guidance is provided to principals regarding student-based budgeting and resource allocation?
    a. Who provides the guidance?
    b. To whom do you go for help?
7. Based on your experience as a principal, what are the benefits and drawbacks of student-based budgeting?
8. In what ways can the student-based budgeting or resource allocation process be improved?
9. How has student-based budgeting affected equity in your school?
    a. How has SBB helped or hindered your ability to address student equity issues?
    b. How, if at all, has SBB led to more equitable student outcomes?

COVID-19

10. How has your approach to resource allocation changed during the pandemic?
    a. How has virtual learning and hybrid learning affected resource allocation?
11. In what ways has the pandemic affected your ability to use resources as allocated or intended?
12. How have you mitigated resource allocation challenges resulting from the pandemic?
13. What long-term effects do you think the pandemic will have on resource allocation?

Wrap-Up

14. Is there anything else you would like to add to any of the topics we discussed today?

Appendix B: Semi-Structured Principal Interview Protocol (Second Interview)

Focus: How equity informs resource management

1. What factors influence your thinking about equity? (e.g. world events, community context, etc.)
2. What is your vision for equity in your school?
    a. What priorities do you focus on?
    b. Whose voices do you include?
    c. How does your vision manifest itself in your professional decisions?
        i. How does that vision influence disciplinary policies and practices?
        ii. How does it influence your academic strategy?
    d. How do your resource allocation practices help you accomplish your vision?
3. How do you define equitable student outcomes?
    a. How do you measure success or achievement in your school?
    b. What systemic barriers or disparities affect your students?
    c. How do you allocate resources to address these barriers?
4. How do you measure equitable instruction?
    a. What are your policies or practices around assigning students to teachers?
    b. How do you allocate resources to increase capacity for inclusive learning?
    c. What type of resources are available to staff on equity-focused instructional practices?

Focus: Resource management practices

5. How do you involve key stakeholders in your resource allocation process?
    a. Whose voices do you include?
    b. How do you decide whom to include?
6. How do external policies (local, state, or national) influence your approach to resource management?
    a. What policies?
7. How do you use data to inform your resource allocation decision-making process?
    a. What type of data do you use?
    b. How do you allocate resources to facilitate effective data use among your staff?
8. How do you allocate resources to recruit or retain staff?
    a. What skills or qualities do you prioritize in recruitment and retention?
9. How does funding source influence your approach to resource allocation (SBB, Title I, ESSER 2 and 3)?
    a. What types of special considerations are required for different funding sources?
    b. How are different stakeholders involved in how you allocate resources from different funding sources?
10. How do you determine which supplemental supports to allocate your Title I funds?

    a. How do these supports help you achieve equitable student outcomes for disadvantaged students?
11. How do you use ESSER funds to build capacity of your staff?
12. How are you using ESSER funding to ensure equitable access to instruction and interventions for students?
13. Is there anything else you'd like to add or anything you wished I had asked you?

Appendix C: Semi-Structured Teacher Focus Group Protocol

1. How would you describe your school culture?
2. What is your understanding of your principal's vision for your school?
    a. How does your principal use resources to work towards this vision?
3. How would you characterize your principal's leadership style?
4. What type of dialogue does your principal have around equity?
5. What systemic barriers affect students at your school?
    a. What practices or policies are in place to address systemic barriers at your school?
6. How does your principal discuss and address disparities?
    a. How does your principal use resources to address student disparities?
    b. What effect have these resources had in your classroom?
    c. How would you allocate resources differently to better address student disparities?
7. What type of leadership opportunities are available to teachers?
    a. How are resources allocated to develop teacher leadership capacity?
    b. How are leadership positions given to teachers?
8. What role do you have in the resource allocation process?
    a. Does your principal seek input for what resources would best serve students? If so, how?
9. How, if at all, are resources allocated to improve effective data use?
    a. What role does equity have in your data training and use?
10. What resources are available to staff to aid in equitable instruction?
    a. What feedback or professional development are available to improve equitable instruction?
11. Is there anything else you'd like to add or anything you wished I had asked you?

Chapter 4

The Impact of Additional Funding and Principal Flexibility on Student Outcomes

Joint Paper with Dr. Christopher Candelaria

Introduction

In the educational research landscape, school funding has consistently emerged as a contentious focal point. Historically, the debate has centered on whether school resources were directly correlated with student outcomes. Past studies presented an ambivalent picture, suggesting no clear causal connection between school resources and achievement (Jackson, 2020). However, a resurgence of school finance research now underscores the significance of financial resources in molding students' academic trajectories.

Recent findings suggest additional school funding translates into improved student metrics from test scores to graduation rates and even future earnings (Lafortune, Rothstein, & Schanzenbach, 2018; Candelaria & Shores, 2019; Jackson, Johnson, & Persico, 2016). These revelations have reinvigorated discussions around school finance. Yet, an important dimension remains unexplored: How are these funds distributed within schools, and how do varying levels of funding influence student outcomes?

Research has hinted at an unsettling trend—resources within many districts are not equitably disbursed across schools (e.g., Shores & Ejdemyr, 2017). This is concerning if school-level funding allocations systematically limit educational opportunities for disadvantaged and marginalized student populations, as this can lead to negative student outcomes (Houck, 2011; Iatorala & Stiefel, 2003).

Weighted student funding (WSF) combined with site-based budgeting allows schools to take a more equitable and targeted approach to addressing the needs of student subgroups. WSF enables districts to more equitably distribute resources between schools based on student characteristics, while site-based budgeting gives principals budgetary flexibility to allocate resources based on the unique characteristics and educational needs of students in their school (Ladd, 2008; Malen, Dayhoff, Egan, & Croninger, 2017). Ideally, WSF combined with site-based budgeting leads to more equitable student outcomes since higher needs student subgroups receive a higher share of resources through WSF and those additional funds can be targeted to better meet student needs through site-based budgeting.

In order for this approach to close achievement gaps, resource allocation practices must work to address existing inequities in the education system (Plecki et al., 2006). The combination of school based-budgeting and weighted-student funding, also known as student-based budgeting (SBB) in several urban districts, can serve as one method to reduce educational inequities and improve student outcomes (Chang, 2018). While the primary goal of this funding approach is to increase equitable outcomes for students, few rigorous studies explore the extent to which weighted-student funding and site-based budgeting affect student outcomes. Much of the existing literature uses district-level data across only two to three years after this approach has been implemented, and few studies attempt to estimate a causal effect linking student outcomes to this decentralized funding approach (Derby & Roza, 2017; Ouchi, 2006; Ouchi & Segal, 2003; Archibald, 2001; Stroub, 2018).

This paper is one of the first studies to examine this funding policy system in a causal framework. This paper will use a causal approach to examine the SBB program in Metro Nashville Public Schools (MNPS), which began districtwide in the 2015-16 school year. The

MNPS SBB program used weighted-student funding to distribute funds to schools based on student demographics. Through site-based budgeting, principals had the flexibility to use their SBB funds in ways that best addressed their students' needs.

Using MNPS as a case study, the primary goal of this paper is to assess the extent to which SBB improved student outcomes, especially among marginalized and disadvantaged subpopulations, as well as explore the mechanisms that may contribute to the student outcome effects. Specifically, for this study, we will examine the following research questions:

1. Comparing high-dosage to lower-dosage schools before and after the introduction of SBB, to what extent do test-based and non-test-based outcomes change as a result of having additional funding?
2. To what extent do student outcome effects vary by student subgroups, including economically disadvantaged and English language learners?
3. According to analytically coded principal interviews, what mechanisms explain the results we observe?

To answer these questions, we use a mixed methods approach. For research question 1, we investigate the nuanced impacts of SBB on student results using a comparative interrupted time series (CITS) approach. Even though every school implemented SBB in the 2015-16 academic year, we utilize differences in treatment intensity to pinpoint causal impacts. This variation in intensity is derived from certain schools getting more funds due to their student demographics matching the district's priority categories in the weighted funding formula. Consequently, our study design contrasts schools with high funding allocation to those with lesser funding, both before and after SBB's introduction.

For research question 2, we analyze how student outcome effects varied by student subgroup. Specifically, we examine economically disadvantaged students relative to non-economically disadvantaged, ELL students relative to non-ELL, and students with disabilities relative to students without disabilities. For this analysis, we use a binary indicator for whether students belong to these subgroups, using student-level demographic data.

For research question 3, we use a qualitative analysis to explore the underlying mechanisms of SBB that may explain the quantitative analysis findings. The qualitative analysis provides insight into the nuances of SBB that a purely quantitative analysis might overlook. Through this method, we strive to present a more comprehensive understanding of the effects and implications of SBB on student outcomes.

To date, the present study is the first to conduct a causal analysis examining the extent to which varying dosage levels of weighted-student funding and site-based budgeting affect student outcomes using student-level data. Our study provides a unique opportunity to examine whether dosage level of SBB funding has a differential effect on student outcomes. Findings from this study can help inform policy related to how much funding is adequate to achieve desired educational outcomes, as well as provide causal evidence for whether this funding approach is effective.

Additionally, while previous SBB studies have not deeply explored the potential mechanisms affecting student outcomes, the present study uses qualitative data to contextualize our quantitative results. We explore principal flexibility as a mechanism of SBB that may contribute to the observed student outcomes. Having greater insight into which mechanisms of SBB influence student outcomes can help school leaders think more strategically about this funding approach in order to better meet student needs and increase equitable outcomes. Thus,

research exploring if and how SBB affects student outcomes has important policy and practice implications.

Our study finds that test score outcomes in math and ELA improved for high-dosage schools, though evidence for changes in discipline and absences was less strong. ED and ELL students in high-dosage schools displayed better outcomes compared to their counterparts in low-dosage schools, suggesting that SBB can address educational disparities among marginalized groups. Qualitative findings indicate that high-dosage schools benefit from more tailored allocation approaches due to increased budget flexibility, while low-dosage schools face challenges from financial constraints that limit their ability to allocate resources to best meet student needs.

The next section begins with a discussion of current student-based budgeting research highlighting the ambiguities and gaps in existing research.

The Depth and Breadth of Student-Based Budgeting Research

Student-based budgeting, a financial decentralization method, shows potential in diverse, urban education settings with varying levels of student need, but current research has inconsistencies and gaps. Although initial studies indicate improved student performance after decentralization, data limitations make these findings unclear. The following sections will clarify current findings and highlight areas for further research.

The Ambiguities of Student-Based Budgeting Outcomes

Descriptive analyses from various districts suggest improved student outcomes after SBB implementation, including increased achievement scores and narrowed racial achievement gaps. However, these findings should be approached with caution due to potential confounding factors and their non-causal nature.

Student-based budgeting is a decentralized budgeting approach that empowers principals to make school budgeting decisions that, ideally, improve outcomes-based equity for students. SBB can enable principals to better address the unique challenges faced by their student populations. When used effectively, SBB has the potential to bridge equity gaps and tailor resources more directly to student needs.

Several urban districts, such as Edmonton, Houston, and Seattle, have used a financial decentralization approach akin to MNPS. While outcomes have varied across these districts, they have each sought to align resources more directly with student needs and to empower local school leaders with more decision-making authority.

In each of these districts, budget decentralization at the school level is combined with a weighted-student funding approach at the district level with the goal of increasing equity (Ouchi, 2006). With this combined approach, referred to as student-based budgeting hereafter, funding is allocated based on individual student needs. Schools with a higher proportion of students with specific needs, such as English language learners or those requiring special education, typically receive more funding (Goertz & Odden, 1999).

Some studies have shown improved student outcomes associated with student-based budgeting in these districts (Derby & Roza, 2017; Ouchi, 2006; Ouchi & Segal, 2003; Archibald, 2001). After the implementation of SBB, higher achievement scores and smaller racial achievement gaps were observed in Houston, as well as higher achievement scores in Seattle and Edmonton when compared to relatively similar districts (Ouchi, 2006; Ouchi & Segal, 2003). Similarly, SBB in California was also associated with improved test scores (Derby & Roza, 2017).

However, these studies are careful to note that findings are suggestive and not causal with several potential confounders that limit the interpretation and generalizability of the findings (Derby & Roza, 2017; Ouchi, 2006; Ouchi & Segal, 2003). For instance, California's SBB reform began the same year the state switched to a new statewide standardized testing system, so the improved test scores could potentially be related to the change in standardized testing format rather than the implementation of SBB in California (Derby & Roza, 2017).

One study attempted to find a causal link between SBB and student outcomes using quasi-experimental methods. This study examined the causal effect of SBB in Houston Independent School District (HISD) on increased student test scores (Stroub, 2018). While Stroub (2018) did find that test scores moderately improved after the implementation of SBB, the difference-in-differences analysis comparing HISD to coarsened exact matched schools with a similar pre-trend showed that SBB was unrelated to school-level pass rates on the Texas Assessment for Academic Skills.

While the shift towards SBB in districts like Edmonton, Houston, and Seattle demonstrates the potential benefits of student-based budgeting in addressing equity gaps, the body of research presents mixed outcomes. Even as some studies indicate positive trends in student achievement post-implementation, others emphasize the challenges in establishing direct causation due to confounding factors. Nonetheless, these findings serve as a foundation and offer important insights into the dynamics of financial decentralization reforms that combine site-based budgeting with weighted-student funding.

To provide a more accurate understanding of the benefits of SBB, there is a need to address research gaps in prior studies. In the next section, we discuss how a more thorough examination of SBB's impact on educational outcomes requires more intricate research

methodologies that incorporate individual-level data and diverse outcome indicators, beyond achievement scores.

Exploring Broad Gaps in Student-Based Budgeting Studies

Most studies on SBB in relation to student outcomes are constrained by the reliance on state or district-level data. The use of short-term data and a primary focus on achievement scores overlook other essential indicators. To understand the impact of SBB reforms, more comprehensive and rigorous research approaches using individual-level data and broader outcome metrics are essential.

Student-based budgeting analyses face limitations stemming from the scope and nature of the datasets employed. The bulk of the limited studies examining SBB and student outcomes lean heavily on state-level or district-level data. Using these broader datasets can sometimes mask nuances at the school or student level, potentially overlooking critical variations in budget allocations or expenditure impacts (Roza & Hill, 2004). Additionally, district-level analyses might not fully capture the differences in budgeting approaches or the contextual factors that influence student outcomes (Trujillo & Renée, 2012).

Some scholars argue that to grasp the implications of SBB and other related reforms, more granular data, such as school-level or student-level data, might be required (Goertz & Odden, 1999). Student-level or school-level data can reduce bias and increase efficiency of estimates. It provides a more detailed view of student progress, allowing researchers to identify subtle changes or effects that might be obscured at broader levels of aggregation. Such granularity helps in identifying whether certain subgroups benefit more from reforms than others (Downes, 2004). With the depth of data points available at the student level, there's increased statistical power, which can lead to greater precision in estimates and results. This precision can

be crucial in determining the true effects of a reform, especially when the effects are subtle (Hedges & Hedberg, 2007).

Additionally, each of the prior studies discussed above only used two to three years of student outcome data. However, reforms can take three or more years to show an effect. Thus, the positive or neutral effects found could be unrelated to SBB implementation. Relying on short-term data can lead to premature conclusions or misinterpretations about the effectiveness of the financial decentralization approach. This is a significant limitation, as educational reforms often have lagged impacts and may not manifest immediate changes in the short-term assessment periods. For instance, Grubb (2009) emphasized that shifts in school financing mechanisms, especially those altering budgetary control and resource allocation, require time for effective implementation, stakeholder understanding, and integration into daily school operations. The early stages of such reforms can entail rigorous training, reconceptualization of budgetary priorities, and grappling with unforeseen challenges, potentially masking the true, longer-term impacts of the changes (Roza, 2008).

The overarching reliance on broader datasets and shorter evaluation periods can potentially paint an incomplete or even misleading picture of the genuine impacts of SBB reforms. A more comprehensive and nuanced understanding necessitates the use of granular, student-level data over extended periods of time post-implementation. The forthcoming analysis of Metro Nashville Public Schools (MNPS) stands as an important contribution in this direction.

By leveraging seven years of post-SBB implementation data at the student level, this study provides not just depth but also the longitudinal breadth missing in much of the prior SBB literature. In later sections, we'll harness this richer data to more fully uncover the nuanced

effects of student-based budgeting in one of Tennessee's largest districts, offering fresh insights and a more refined lens on the causal impact of such reforms.

Student-Based Budgeting Implementation in Metro Nashville Public Schools

Metro Nashville Public Schools transitioned to student-based budgeting in 2015. The district sought to empower school leaders with funding control, address individual student needs, encourage innovation, enhance equity, and align central office services, all aimed at improving student outcomes in its diverse, urban district. By focusing on MNPS's adaptation of SBB, this study helps to bridge prior gaps about effects of student-based budgeting in large, diverse urban settings.

MNPS is among Tennessee's largest and most diverse school districts. It is the second largest school district in Tennessee and serves more than 85,000 students across approximately 150 schools. The district serves a school population of over 60 percent black or Latino students with approximately 40 percent of students in the district qualifying as economically disadvantaged (TDOE, 2023).

Given its diverse student population with varying student needs, MNPS sought a way to more equitably use resources to better serve student needs and undertook a pilot program to provide select principals with school budgetary flexibility. This pilot, which began in the 2012-13 school year and rolled out in 17 schools over a two-year period, was MNPS's initial step in examining how principal budgetary flexibility could be best tailored to its unique district context. It gave principals greater discretion over a portion of their budget but did not yet give these schools additional weighted funding based on student characteristics (MNPS, 2023).

The pilot provided MNPS insights into the potential challenges and merits of providing principals with greater budgetary flexibility. For instance, one significant advantage noted was

the empowerment of school leaders, which allowed them to allocate resources in ways that directly benefitted their students. The pilot also highlighted the need for more robust and structured processes as well as more comprehensive training to ensure school leaders were equipped to navigate the complexities of the SBB model (MNPS, 2014).

The insights gained during the pilot years informed the SBB design team. The design team consisted of six principals, three teachers, and six central office staff who helped define and build the SBB formula. They sought to empower school leaders to best meet student needs in their school, enable innovative resource allocation decision-making, encourage accountability for resource decisions and subsequent outcomes, increase resource equity, promote transparency in school funding, and align central office services to the needs of schools (MNPS, 2014).

Using the SBB formula developed by the SBB design team, MNPS began a district-wide adoption of SBB in the 2015-16 school year, giving principals control over $400 million of the district's budget. SBB funding flowed to zoned and magnet elementary, middle, and high schools through the SBB formula (MNPS, 2023). Special education schools, pre-k centers, non-traditional schools (including adult schools and alternative schools), and virtual schools were excluded from SBB dollars. SBB weights included a grade weight, prior academic performance weight, ELL weight, SPED weight, and a base weight (MNPS, 2023).

To ensure its successful implementation, the district made significant investments in training for school leaders and established robust communication mechanisms between the central office and individual schools. Over time, as schools grew more familiar with SBB, many began to appreciate its inherent flexibility, allowing them to be more responsive to their unique student populations.

Metro Nashville Public Schools' adoption of SBB in 2015 can be seen as an important step in its quest for educational equity and innovation. By centering funding decisions around individual student needs, the district showed its dedication to working to ensure every student's success. As a result, examining MNPS's SBB adoption provides insights for other districts considering a similar transition.

By examining MNPS, researchers and policymakers will gain greater understanding into an SBB system that governs a large, urban school district with a diverse student population. Moreover, given that reforms often take multiple years to show effects and SBB has been implemented for several years, the study will provide an opportunity to observe whether SBB leads to more equitable student outcomes. Specifically, this paper will contribute to the literature on whether money matters in student outcomes and allow us to explore whether a higher share of resources relative to a lower share of resources leads to better student outcomes.

Conceptualizing Student-Based Budgeting

SBB is rooted in the education production theory, which suggests that improving student outcomes requires recognizing diverse student needs. By giving school principals the flexibility to allocate resources, SBB enables a more tailored approach to addressing individual needs. This section delves into the theoretical underpinning of SBB, exploring its potential advantages in ensuring equity and effectiveness in education.

Education Production Theory and Student-Based Resource Allocation

Education production theory underpins SBB and emphasizes the importance of allocating resources or inputs effectively to maximize educational achievement, while also acknowledging that students have different learning needs and abilities. The theory suggests that different combinations of inputs can lead to varying levels of educational success, and it aims to identify

the most efficient ways to allocate and tailor resources to lead to improved student outcomes and more equitable schools.

From an economic perspective, the principal's objective in student-based budgeting is to determine the minimum cost for achieving desired student outcomes. Rooted in the education production theory, this approach emphasizes that schools function similarly to producers, where inputs (such as teaching quality, class sizes, and school resources) are transformed into outputs (student achievements and outcomes). Recognizing the heterogeneity in student learning needs, the theory suggests that different inputs are required for different students to achieve equivalent educational outcomes.

Optimizing student outcomes requires appropriate and targeted resource allocation, especially given the varying needs of diverse learners. According to Hanushek (1979), the efficiency of resource allocation is crucial. Misallocated resources may not yield the desired outcomes, especially when considering the diverse needs of students. As Lovenheim & Turner (2016) pointed out, resources needed to produce a particular outcome can vary significantly across students. Therefore, a one-size-fits-all approach in allocating funds may not be optimal.

This perspective underscores the value of student-based budgeting, allowing schools to tailor their resources based on the individual needs of their student populations. For example, English language learners typically require additional resources, such as greater access to tutoring resources or instructional coaches, to attain the same level of student achievement as native English speakers. Thus, from an equity standpoint, SBB allows principals to tailor instructional and curriculum expenditures (i.e., the inputs) to help students achieve high standards of learning (i.e., the output).

While education production theory provides a high-level framework for how student-based budgeting may function, it does not provide information about the particular mechanisms that may lead to more equitable schools and student learning outcomes. Recent research indicates that greater school autonomy and accountability may be one lever by which student outcomes are improved (Edunomics, 2020). In line with this research, we hypothesize that principal flexibility is the primary mechanism that leads to improved student outcomes.

While SBB in MNPS does not provide principals with full budget autonomy, principals who have access to a larger proportion of funds have more flexibility to allocate resources to best meet student needs. A forthcoming paper with Candelaria et al. (2023) describes flexibility as the discretionary budgeting principals exercise with their remaining SBB funds after meeting district required allocations, such as minimum teacher staffing ratios. Such a system allows principals to tailor the use of flexible SBB funds to the unique requirements of their students, reinforcing the importance of efficient resource allocation posited by education production theory.

Principals overseeing high dosage SBB schools, or those that serve a larger proportion of students from specific weighted subgroups (e.g. ELL, economically disadvantaged, or SPED), receive a higher per-pupil funding allocation, and, therefore, have more flexibility to allocate resources to meet their students' needs. With the greater financial flexibility that comes with increased funding, these schools can provide more tailored interventions, specialized staff, and additional learning materials. As a result of the increased resources and financial flexibility, we anticipate a more significant positive impact on student outcomes in high dosage schools compared to low dosage schools.

By aligning resources with the unique needs of diverse student populations, especially in high dosage schools, principals can better address the challenges faced by specific subgroups.

When schools proactively allocate resources based on student needs, they foster environments where every child can thrive academically and socially (Reardon, 2011). This approach not only benefits the students in the immediate term but also contributes to long-term societal benefits by producing a more educated populace (Orfield & Lee, 2005).

As we transition to discussing how principal flexibility can lead to more effective schools that better serve student needs, we must recognize the essential role that strategic resource allocation plays. Leaders in effective SBB schools leverage flexibility in budgeting to usher in innovative, student-centric strategies in an effort to drive both equity and excellence in their schools.

Resource Allocation in Effective Schools

Leveraging effective school practices, SBB empowers principals to strategically allocate resources for professional development, student support, and enhanced instructional capacity, ultimately leading to improved equity and student outcomes.

The effective schools literature provides insight into how principals may use their increased flexibility to improve outcomes-based equity and school effectiveness through resource allocation decisions. Edmonds (1979), often regarded as a pioneer in the effective schools research, outlined several characteristics of successful schools, emphasizing the importance of strong leadership in fostering an environment conducive to learning. One of the central tenets of this research is the idea that leadership has a pivotal role in the decision-making process, especially concerning resource allocation (Leithwood, Louis, Anderson, & Wahlstrom, 2004). With the increased flexibility offered by student-based budgeting, principals have the flexibility to prioritize resources to areas that most directly impact student achievement, such as

quality teaching, targeted interventions, and a strong curriculum (Sammons, Hillman, & Mortimore, 1995).

Additionally, the importance of fostering a positive school climate, which is intricately linked to resource allocation, has been underscored in the effective schools literature (Hallinger & Heck, 1998). Principals in effective schools invest additional resources into teachers to help them better address the needs of all students within a school (Williams et al., 2005; Odden, 2009; Marzano, 2003; Togneri & Anderson, 2003). For instance, investing in professional development and continuous learning opportunities for teachers can have a positive effect on student achievement (Robinson, Lloyd, & Rowe, 2008).

Effective leaders work collaboratively to develop an adaptable learning environment that promotes innovative strategies for effective schools (Ouchi & Segal, 2003). Schools that have successfully bridged the achievement gap consistently demonstrate a commitment to equity, ensuring that resources are allocated in a manner that meets the diverse needs of all students (Bryk et al., 2010). These schools may devote additional resources to providing support for struggling students and increasing instructional capacity and effectiveness through means such as extended school days or a longer school year (Odden, 2009; Blakenstein, 2004; Marzano, 2003). Implementing these inputs can lead to improved educational outcomes for high-needs students, such as economically disadvantaged, special education, and ELL students (Williams et al., 2005; Odden and Picus, 2019).

The effective schools literature underscores the impact of strategic resource allocation, steered by effective leadership, in sculpting schools that advance equity and improve student outcomes. Principals can be transformative when leveraging flexibility to tailor resources to the unique needs of their student body.

In the forthcoming analysis, qualitative interviews will provide a lens into the nuances of how MNPS school leaders use their budgetary flexibility to allocate resources and improve student outcomes. By capturing firsthand accounts, these interviews will highlight the strategic approaches principals use to craft schools that both uphold academic standards and effectively respond to the multifaceted educational needs of all students in their school.

Analytic Plan and Methods

This study employs a mixed-methods approach, blending rigorous quantitative analyses of SBB effects with nuanced qualitative feedback from school leaders. Through this dual perspective, we aim to understand both the broad and detailed impacts of differential funding on student subgroups. Additionally, by exploring the experiences of principals, we gain deeper insights into how flexibility in resource allocation under SBB might influence student outcomes.

Quantitative analyses

We examine the multi-layered effects of SBB on student outcomes using a comparative interrupted time series (CITS) design. Although all schools adopted SBB in academic year 2015-16, we leverage variation in the dosage of treatment to identify causal effects. The dosage variation we use is based on schools receiving more funding relative to others because student demographics in these schools aligned with priority categories in the district's weighted student funding formula. Our research design, therefore, compares high-dosage schools with low-dosage schools before and after the introduction of SBB. Importantly, to ensure a consistent sample of schools, we include only schools that are in all years of our sample period, spanning 2011-12 to 2021-22.

Dosage-Based Measure of Treatment

Although the district officially launched SBB—the combination of weighted student funding (WSF) with site-based budgeting—in academic year 2015-16, two pre-implementation details informed our conceptualization of dosage: (1) a pilot study between 2013-14 and 2014-15 and (2) a school-level spreadsheet of simulated per-pupil funding amounts based on the introduction of weighted student funding. We learned about these pre-implementation details through multiple conversations with current and former leaders in the district and by reviewing policy documents and files given to us by the district officials. As we discuss below, we restrict our analyses to elementary schools and classify schools as high dosage if the difference between simulated funding in 2015-16 and actual funding in 2014-15 was positive.

Pre-Implementation Pilot Study Considerations. In the 2013-14 school year, the district gave site-based budgeting flexibility—not additional funding—to turnaround schools and to schools with principals that were designated as strong leaders in the district. The district wanted to understand how principals would respond to site-based budgeting (i.e., budgetary flexibility), rather than be held to district-mandated staffing ratios. This list consisted of 17 schools, which spanned the elementary, middle, and high school levels; however, only 14 of these school were still open at the beginning of the 2015-16 academic year. In the following year, 2014-15, the district gave all middle and high schools budgetary flexibility, but no additional funding. While we do not have any data associated with the pilot study, we are able to identify all schools involved.

Because pilot study schools received part of the full SBB treatment—that is, budgetary flexibility—before implementation in 2015-16, we limit our analyses to elementary schools. By focusing on elementary schools, we leverage an uncontaminated before and after contrast,

improving the causal warrant of CITS research design. In our sample, we found that only 6 elementary schools were part of the pilot study. In total, we have 61 elementary schools in our analytic sample.

Using Simulated Funding Amounts to Create Dosage. From the district, we identified a spreadsheet that included simulated school budget comparisons before and after the introduction of SBB. The file includes each school's per-pupil base funding in academic year 2014-15 as well as the predicted SBB allocation per pupil based on the new weighted student funding formula for the 2015-16 academic year, the first year of implementation. We created our measure of dosage using the raw difference in per-pupil funding between the two years. If the difference is negative, then the school belongs to the low-dosage group (i.e., $D = 0$). Practically speaking, schools in this category would not actually lose funding, as the district included hold-harmless safeguards; these schools would receive no less than the previous year's funding amount. Among schools for which the difference is positive, we assign them to the high-dosage group (i.e., $D = 1$).

Figure 4-1 visually shows the distribution of the funding difference between academic years 2014-15 and 2015-16. There is a total of 20 schools that serve as our comparison group. The negative predicted funding differences range from -$8 to -$2,100 dollars per pupil, but again, this is a hold harmless group that will not lose funding. Among the high-dosage group, values range from $43 to $862 dollars per pupil, with the mean amount at $312 per pupil.

We consider this dosage measure to be a valid instrument for several reasons. First, the funding amounts that were simulated for 2015-16 were not based on actual enrollment data for that school year. Instead, they were based on projected enrollments based on 2014-15 data. The use of projected enrollment ensures we are not mechanically incorporating any student sorting

across schools. Second, funding amounts were not publicly broadcast to families with the introduction of SBB. Families would have no access to either the 2014-15 per-pupil funding amounts nor the projections in 2015-16.

Identification Strategy: Comparative Interrupted Time Series (CITS) Design.

To determine the effect of differential dosages of funding, we leverage a comparative interrupted time series (CITS) design. Our comparison group contains the low-dosage schools, or the hold-harmless group. The CITS model is similar to a difference-in-differences strategy in that we compare differences in outcomes before and after SBB to differences in outcomes between high and low-dosage schools. This design also provides strong causal warrant since we can directly account for secular shocks that affect MNPS by including year fixed effects.

We operationalize our CITS design by estimating the following equation:

$$y_{isgt} = \theta_s + \mu_t + \theta_s t + \gamma_g + X_i'\delta + \sum_{j=2016}^{2022} \beta_{1j}(1[D_s = 1] \times 1[t = j]) + \varepsilon_{ist} \qquad (1)$$

where y_{isgt} denotes an outcome for student i in school s in grade g in year t; θ_s is a school fixed effect, account for time-invariant school level factors; μ_t is a year fixed effect to account for secular shocks that are common across the low and high-dosage school in the district; $\theta_s t$ is a linear time trend estimate for each school to account for any pre-treatment differential trends; γ_g is a grade-level fixed effect to account for level differences in outcomes by grades; X_i' is a vector of student-level controls including economic disadvantage (ED), non-native English speaker/learner (ELL), special education status (SPED), gender, and race/ethnicity. In addition to including the main effects of each of these controls, we also allow them to vary by grade by interacting them with a grade-level fixed effect; and ε_{ist} is assumed to be a mean-zero random error term. In estimation, we estimate cluster-robust standard errors at the school level.

Our parameters of interest are the β_{1j}, which are the dynamic causal estimates of SBB for the high-dosage group, $D_s = 1$, in year t, which ranges from 2015-16 to 2021-22. Because each dynamic effect is identified based on a different cohort of students in each school, it may also be characterized as an exposure effect. In other words, we might expect smaller effect sizes among cohorts that received treatment in the early years of treatment relative to those that had more exposure to the treatment, where a larger effect would be more likely. Importantly, the key identifying assumption is that trends in outcomes for students in low-dosage schools serve as a valid counterfactual for what would have happened if treatment had not occurred.

We also present results where we estimate a standard difference-in-differences model. We use the following model:

$$y_{isgt} = \theta_s + \mu_t + \theta_s t + \gamma_g + X_i'\delta + \rho_1(1[D_s = 1] \times Post_t) + \varepsilon_{ist} \quad (2)$$

where $Post_t$ takes value one beginning in the first year of SBB: 2015-16. In this model, ρ_1 summarizes the dynamic effects in a single point estimate. We provide estimates of ρ_1 for our entire treatment period (i.e., 2015-16 to 2021-22) and before the COVID-19 pandemic (i.e., 2015-15 to 2018-19).

Analyzing Heterogeneity Among Student Subgroups

Recognizing that not all students are impacted equally, we also examine the differential effects of SBB based on distinct student subgroups: economic disadvantage (ED); non-native English speaker/English language learner (ELL); and special education (SPED). This focus ensures our conclusions account for the diverse MNPS student population and aligns with groups in the district's weighted student funding formula. To estimate outcome effects by student subgroup, we estimate Equation (2) by restricting our analyses to each student subgroup (that is,

ED = 1, ELL=1, and SPED=1) and comparing them to students not in those subgroups (that is, ED = 0, ELL=0, and SPED=0).

This approach allows us to examine the effects of SBB funding allocations on distinct student subgroups, enabling us to identify if and how resource allocation differentially impacts students based on their specific needs or backgrounds. Through these analyses, we seek to provide a more comprehensive understanding of the interplay between funding dosage and student subgroup characteristics in shaping educational outcomes.

Robustness Checks and Assumptions

To assess the reliability and validity of our findings, we undertake two sets of robustness checks. First, we examine whether the composition of students changed as a result of SBB. Demographic shifts in the student population would suggest that any results we may observe are attributable to differences in student populations and not the impact of SBB alone. We conduct this robustness check using the specification from Equation (2) on both all years of data and the pre-COVID years of data.

Second, on our test score data, we may worry that certain groups of students have differentially sorted to not take the end-of-year state standardized assessment. We test for differences in test score missingness and suppression for all students and by demographic characteristics. In our assessment of demographic shifts, we use Equation (2) to examine estimates for all years of data and for the pre-COVID sample.

The goal of these checks is to test the integrity of our findings. These checks help us ensure that our findings are not due to some overlooked confounder in the data. They strengthen our findings and causal claims.

Qualitative Analysis

Our qualitative approach is anchored in rich interviews with school principals, offering a deeper dive into the complexities of decision-making within the SBB framework. By merging these narratives with our quantitative data, we enrich our understanding of potential SBB mechanisms affecting student outcomes.

Coding Strategy

For our qualitative analysis, we used the analytical coding method, a technique rooted in grounded theory, to interpret and derive deeper insights from our raw data (Charmaz, 2006). Analytical coding extends beyond merely describing the data by identifying emergent themes, relationships, and underlying processes (Saldaña, 2015). This approach allows researchers to uncover patterns and connections within the data and start generating theory. By using analytical coding, we aimed to move beyond surface-level understandings to derive theories, explanations, and nuanced insights about SBB. We sought to ensure that our findings were not only detailed but also grounded in the experiences and perspectives of our participants (Strauss & Corbin, 1990).

Ensuring Reliability and Consistency in Analysis

Two graduate research assistants coded the principal interviews using Dedoose for Summer and Fall 2021 interviews and NVIVO for Summer and Fall 2022 interviews. These two coding tools helped ensure that our coding process was both rigorous and reliable. Post coding, they drafted analytic memos, a practice recommended by Charmaz (2006) in grounded theory methodology, to synthesize their findings and provide a coherent interpretation of the qualitative data. These memos not only informed our qualitative analysis but also served as a means to

triangulate our quantitative analyses. The memos offered a more in-depth perspective to enhance our quantitative findings.

To ensure the reliability and validity of our qualitative findings, we integrated double-coding practices on select interview transcripts. This method was particularly effective in establishing inter-rater reliability, a metric indicating the consistency of coding application between different coders (Miles, Huberman, & Saldaña, 2014). In instances where coding discrepancies emerged, these were addressed through in-depth discussions and, when necessary, consultations with the larger research team. Drawing on analysis tools, double-coding practices, and collaborative team discussions, we strengthened the robustness and credibility of our qualitative insights.

Data

To estimate the impact of student-based budgeting within MNPS, our study uses both quantitative and qualitative data. By juxtaposing quantitative data with the candid narratives of principals, we aim to bridge the divide between theory and practice, offering a more holistic view of SBB's impact.

Quantitative Data

Using district-level administrative data, we examine the effects of SBB on key student outcomes, including test scores, discipline outcomes, and attendance for elementary school students. The district data are housed by the Tennessee Education Research Alliance and made available through a data sharing agreement with the district. Our sample spans just over a decade, academic years 2011-12 to 2021-22, offering a detailed quantitative view of MNPS schools and its students. In addition to student outcomes, the data include student-level demographic characteristics, such as whether the student falls into any of the following

categories: economically disadvantaged (ED), special education status (SPED), or English language learner/non-native speaker status (ELL) status. We also have data on gender and student race and ethnicity.

Outcome Measures

In this section, we discuss the construction of our outcome measures. This study uses student standardized test scores in math and ELA, discipline outcomes in terms of in-school suspensions and out-of-school suspensions, and attendance outcomes in terms of total absence rates and unexcused absence rates.

Standardized Test Scores. Test scores in elementary school are available for 3rd and 4th grade in Math and ELA. Although some schools in the district added a 5th grade over our sample period, we only use 3rd and 4th grade scores to keep estimates comparable over time. Test scores are standardized by year, grade, and subject relative to the state's distribution of scores. District data are not available from the 2015-16 school year due to a testing glitch and data from 2019-20 are missing as the COVID-19 pandemic affected the testing schedule.

Discipline Outcomes. For each student and year in our administrative files, we create an indicator variable that takes value 1 if the student was given an in-school suspension at least one time over the course of the school year and value zero, otherwise. We do the same procedure for out-of-school suspensions. Because these are binary outcome variables, our regression models should be viewed as linear probability models.

Attendance Outcomes. Using student-level enrollment data, we extract three variables. First, we obtain each student's total days of instruction within a school. Second, we obtain a student's total number of absences. Third, we obtain a student's total number of unexcused absences. We compute a student's absence rate as the percentage of total absences relative to the

total number of instructional days. And similarly, we compute a student's unexcused absence rate as the percentage of unexcused absences relative to the total number of instructional days.

Overview of the Analytic Sample

Table 4-1 summarizes our analytic sample based on baseline characteristics averaged across pre-treatment years 2011-12 and 2014-15. With respect to demographics, we observe higher proportions of economically disadvantaged (ED) students and English language learners (ELLs) in high-dosage schools (i.e., $D_s = 1$) relative to low-dosage schools. Specifically, 79 and 37 percent of students are ED and ELL, respectively, in high-dosage schools. The corresponding percentages in low-dosage schools are 70 and 18 percent, respectively. Standardized test scores are also lower in high-dosage schools. In the 3rd and 4th grade, math scores are 0.23 standard deviation units below the state average, while they are 0.03 standard deviation units above the state mean in low-dosage groups. A similar pattern holds true for ELA test score outcomes. There are no substantive differences with respect to ISS rates across the groups, but students in lower-dosage schools appear to have a higher likelihood of receiving an out-of-school suspension. Finally, we observe that students in lower-dosage schools have higher absence rates than their higher-dosage counterparts.

Qualitative Data

To gain a deeper understanding of principals' decision-making processes under student-based budgeting, we conducted interviews with MNPS school principals. All principals within MNPS were extended an invitation to participate in the study, and 26 principals across all tiers agreed to participate. The qualitative analysis for this paper uses interview data from all 11 elementary school principals that participated in order to provide insight into possible mechanisms that influence the results we observe at the elementary tier level in our quantitative

analysis. The interviews were conducted between Summer 2021 and Summer 2022. Each interview lasted approximately 45 minutes, and each participating principal was compensated with a $50 gift card.

We used a semi-structured interview approach with the intent of fostering a balance between guided inquiry and open dialogue. The semi-structured format was designed to ensure that we covered key areas of interest through a set of pre-determined questions as well as to create an environment for the participants to openly share their unique perspectives. To ensure consistency across interviews, all interviewers were provided with a guide that outlined the core interview questions but were encouraged to ask respondents to expound on answers. This approach facilitated the collection of comprehensive qualitative data that was structured around our research objectives and enriched by the diverse experiences of the participants.

The sessions were conducted via videoconferencing software. With permission, the sessions were recorded to ensure an accurate transcription. After the interviews were completed and transcribed, graduate research assistants coded the interviews using Dedoose or NVIVO.

We use the qualitative data to contextualize our quantitative findings. The depth of the qualitative data combined with the breadth of quantitative data provides a more holistic exploration of whether and how differential funding affects weighted student groups. Below, we discuss the characteristics of our qualitative sample.

Qualitative Sample Characteristics

This paper focuses on 11 elementary school principals who were interviewed as part of the larger SBB study. Six of the elementary principals served schools that were predicted to receive a high dosage in the districtwide SBB implementation year. Five of the principals served schools that were predicted to receive a low dosage in the initial districtwide SBB implementation year.

Principals of high-dosage schools, as seen in Table 4-2, exhibit a wide range of years in the principalship (M=6.67, SD=6.71), from early-career principals with as few as 3 years to more seasoned veterans with 20 years of principal experience. Most of the principals in high-dosage schools had 4 or fewer years of experience. However, they had more extensive total years of education experience (M=21.33, SD=8.5) and typically served as teachers or assistant principals for many years prior to reaching the executive principal level. A commonality among principals in the high-dosage schools is that a majority lack prior budgeting experience before working with SBB in MNPS.

Conversely, the low-dosage school principals consistently possess greater years of experience, both in their roles as principals (M=12.6, SD=6.35) and within the broader educational field (M=22.6, SD=9.4). A majority have dedicated over a decade to educational leadership, and their cumulative years in education frequently surpass those in the high-dosage schools. Notably, this group also features a higher proportion of principals with prior budgeting knowledge before working with SBB in MNPS.

Results

RQ1: Comparing high-dosage to lower-dosage schools before and after the introduction of SBB, to what extent do test-based and non-test-based outcomes change as a result of having additional funding?

Evidence from Event Studies

To provide an overview of our findings and to assess whether low- and high-dosage schools were trending similarly prior to the introduction of SBB in 2015-16, we estimate event studies for each of our outcomes using a variation of Equation (1). Although Equation (1) allows for a dynamic treatment effect (i.e., it includes lags of the treatment effect in the years after

SBB), it excludes leading indicators of treatment. We add binary indicators for the years before treatment to formally test whether low- and high-dosage groups were trending similarly before SBB. We present results in Figure 4-2.

Across our test score outcomes (Panel A) and our attendance outcomes (Panel C), we do not observe any statistically significant differences between high- and low-dosage groups. The lack of statistically significant differences and any discernible patterns suggest that the parallel trends assumption for a difference-in-differences-style analysis holds. In the years after SBB, we observe that there is an effect of about 0.20 standard deviation for both math and ELA, suggesting the additional funding and any flexibility associated with that funding improved academic achievement. However, we observe an unusual pattern with attendance. The event study in Panel C shows that total absences increased after SBB, and they appear to be driven by unexcused absences.

Results in Panel B show that low and high-dosage schools were trending differentially in terms of out-of-school suspensions. We observe that the probability of an out-of-school suspension was increasing prior to SBB in high-dosage groups relative to low-dosage groups. Even though none of the point estimates associated with this trend are statistically significant, we suggest caution when interpreting these results in the CITS analyses. Nevertheless, despite the upward trend prior to SBB, there is evidence that the probability of suspension qualitatively decreased after the introduction of SBB, as none of the point estimates are statistically significant.

Evidence from Comparative Interrupted Time Series and Difference-in-Differences

In this section, we formally estimate the CITS model in Equation (1) and we also report results for the difference-in-differences estimate from Equation (2). We present results for test

scores, discipline, and attendance outcomes in Tables 3, 4, and 5, respectively. Our preferred specifications across all the tables are columns (2) and (4), which include student controls, consisting of race/ethnicity indicators and indicators for ED, ELL, and SPED status, interacted with grade-level fixed effects.

Test score outcomes. Similar to the event study results, we find that 3rd and 4th grade math test scores increased by about 0.18 and 0.21 standard deviations in academic years 2016-17 and 2017-18, respectively. As previously mentioned, there were no testing data for the first year of SBB and during the onset of the COVID-19 pandemic, so we do not report estimates for those years. While the point estimates are statistically insignificant after the 2017-18 academic year, they remain elevated. The lack of statistical precision likely stems from having a larger treatment group relative to the control group and because we are several years post treatment, both of which result in lower statistical power. To gain power, we estimate the difference-in-differences model and find that the pre-COVID effect resulted in an increase of 0.18 standard deviations and across all years, the point estimate is 0.15 standard deviations, but is marginally significant at the 10 percent level.

A similar pattern holds for ELA scores, but statistical significance drops after the 2016-17 academic year. The difference-in-difference estimates, however, both indicate that ELA scores increased when we average across years. ELA scores went up by 0.13 standard deviation before the onset of COVID-19 and by 0.11 standard deviations across all years in the sample.

Discipline Outcomes. In Table 4-4, we find no clear evidence of an effect for either reducing the probability of in-school suspensions or out-of-school suspensions. Based on the descriptive statistics and the baseline mean reported in Table 4-4, it appears that in-school suspensions for elementary schools are not common in the district—the probability of suspension

in 2018 among students in high-dosage schools was approximately 0.0015. And while out-of-school suspensions are slightly more common—the baseline probability is 0.026—we cautiously interpret results from the CITS and difference-in-differences given the presence of pre-treatment trends in the event student. At a bare minimum, the dynamic CITS results reveal that out-of-school suspension rates are decreasing with each year of exposure to SBB implementation.

Attendance Outcomes. Given the increase in test scores for math and ELA, we would expect a corresponding decrease in absences, but our results provide suggestive results in the opposite direction. We focus on the difference-in-difference estimates for pre-COVID years, given the unpredictable absence patterns that occurred during the pandemic. Overall, we find that total absences increased by about 0.78 percentage points; however, the result is marginally significant at the 10 percent level. This finding would suggest an absence rate of about 5.83 percent after SBB implementation. Assuming a 180-day school year, this corresponds to missing about 10.5 days per year. There is a similar increase in unexcused absences (i.e., 0.66 percentage points, marginally significant), but the effect of this pre-COVID would reflect about 5.5 unexcused absences relative to the baseline of about 4 absences.

RQ2: To what extent do student outcome effects vary by student subgroups, including economically disadvantaged students, English language learners, and special education students?

Table 4-6 reports the results of our heterogeneity analysis. We examine whether there are differential effects by economic disadvantage, English language learner, and special education status. Each row denoted by (A) or (B) reflects the estimate of a different model. For example, ED=0 refers to non-economically disadvantaged students and ED=1 refers to economically disadvantaged students.

We find that economically disadvantaged students and English Language Learners in high-dosage schools performed better on math and ELA tests relative to students with the same demographic characteristics in low-dosage schools. Given that students in these categories receive more funding, the results suggest that principals are using their funds (and flexibility) to improve academic outcomes for the groups that need it most. We consider this hypothesis in our qualitative analysis. Although the effect for Special Education students, a group that also receives additional funding, is not statistically significant, the results are positive and are of a similar magnitude to economically disadvantaged and English Language Learner students. For the other non-test-based outcomes, we do not find heterogeneous group effects.

Robustness Checks

We assess the validity of our results in Tables 7 and 8. Given that our primary findings are associated with test-based outcomes, the most relevant check for demographic changes are based on student characteristics in grades 3 and 4, the test grades. Across all of our demographic characteristics, we find no evidence of demographic shifts either across all years or pre-COVID. We also find no evidence that high-dosage schools experience differential test score missingness or suppression relative to their counterparts in low-dosage schools in Table 4-8. We conduct these missingness/suppression tests for all students and based on student demographic characteristics.

Qualitative Findings

RQ3: According to analytically coded principal interviews, what mechanisms explain the results we observe?

This section examines potential mechanisms that may influence the results we observe in our quantitative analysis. The findings suggest that high-dosage schools benefit from budgeting

flexibility, allowing them to adapt to student needs and invest in personnel, leading to enhanced student outcomes. In contrast, low-dosage schools grapple with financial constraints, limiting their adaptability and resource allocations. The narratives reveal that limited funding in low-dosage schools constrains their ability to innovate and support students comprehensively. Both school types, however, universally emphasize the importance of investing in quality personnel for student success.

Considering Broader School Contexts

On a broader level, school context plays an undeniable role in shaping the direction and outcomes of resource allocation decision-making in all school types. Principals work to understand the unique intricacies of their specific school community and make choices that resonate with their school's overall needs. Principal Smith's reflections highlight this. She discusses how "almost 80%" of her students are ELL at her high-dosage school, which greatly influences her decision-making. She states, "There's an awful lot of programs that work out there for other schools but may not work for my babies here." Smith's words underscore the fact that certain solutions, while potentially effective in some contexts, may not be the best fit for others. She emphasizes the need for critically evaluating the potential impact of resources in the context of a school's specific demographics. "And still, it's not just the outside evidence that's important. That's a piece of it. But a larger piece is does it work for us with our specific population?" Smith's reflection emphasizes the importance of critically evaluating potential interventions and programs to ensure their efficacy with different populations of students.

Further echoing this sentiment, Principal Clark at a low-dosage school states, "I serve a population of students, our school is predominately Hispanic and Latino. And our poverty rate is very high as well. So whenever I'm thinking about the utilization of money, I'm always thinking

about the people that I serve." This statement reinforces the idea that budgeting and resource allocation should always be aligned with the unique characteristics and needs of a school's student population. It speaks to a more nuanced and tailored approach to school budgeting.

It is evident that the observed outcomes in schools, whether high-dosage or low-dosage, are profoundly influenced by the unique school context and demographics. Principals, as the central figures in decision-making, prioritize understanding the intricacies of their specific school community, ensuring that resource allocation resonates with the overarching needs of their students. Collectively, these reflections underscore the principle that a one-size-fits-all approach is inadequate.

Deep Understanding of Students' Multifaceted Needs

SBB's foundational premise is rooted in the idea that school principals are in the best position to understand and respond to the unique needs of their student population. This understanding is not just based on raw data or general statistics but is deeply personal and intimately linked to daily interactions and observations. This notion was consistently emphasized by the principals in the high-dosage schools. Principal Miller highlighted this connection by saying, "So I understand, very intimately, the needs and even the unspoken things that my students may need. So I consider all of that when I start making decisions." This quote sheds light on the depth of the connection principals can have with their students. They do not solely focus on overt signs of struggle or success; they also pick up on the subtleties and the hidden challenges that might otherwise go unnoticed. Further expanding on this, Principal Baker also stated, "We truly know our school, and the student population that we serve. We know the needs of our families. So being able to arrange budget dollars to meet the needs of a wide variety of different generations, different demographics, and backgrounds…We know the struggles that our

students go through on a daily basis, even before they come to school." This statement reinforces the fact that understanding student needs goes beyond just academics. In order for principals to allocate resources in a way that best serves their student needs, principals recognize the broader challenges their students face, from generational issues to cultural differences, and ensure that resources are allocated in a way that addresses these multifaceted challenges.

Principal Fulton, another principal at a high-dosage school, further captures the complexity of the needs and challenges students face by highlighting the various lenses through which students' lives must be viewed. She states, "You've got the trauma lens, you've got the immigrant lens, you've got the non-English speaking lens. You've got the domestic abuse lens. You've got all the things. And so you really have to see it from every angle in order to meet that student's needs." Fulton's statement underscores the multifaceted realities students grapple with, beyond academic performance or behavioral conduct. Like other principals, she recognizes that a nuanced perspective is critical for educators to effectively address each student's unique needs when equitably allocating resources.

A key mechanism influencing student outcomes is the depth of understanding that school principals have regarding their students' needs. This understanding is rooted in daily interactions and keen observations. High-dosage school principals, in particular, consistently emphasize their deep connection with students, taking into account both obvious and subtle challenges their students face. The richness of their perspective, considering various facets of students' lives—from cultural backgrounds to personal struggles—highlights the importance of a nuanced approach in education. This intimate knowledge, especially prominent among high-dosage principals, when combined with tailored resource allocation, could be one of the driving forces behind some of the positive student outcomes observed in the quantitative analysis.

Using Increased Flexibility to Meet Student Needs

In the realm of educational funding, the allocation and utilization of resources play a pivotal role in shaping student outcomes. SBB provides additional funding and enhanced flexibility to high-dosage schools, empowering principals to tailor their resource allocation decisions based on the unique needs of their student population. Principal Smith at a high-dosage school emphasizes the flexibility that such funding brings to the leadership role, allowing for the selection of resources that are most needed. He states, "So if I see a specific need for my school, I can spend money to get those resources which is nice." Principal Davis mirrors this sentiment by stating, "We're able to make decisions that benefit our school instead of that being made for us...we get to determine the need and figure out how to meet that need." Additional SBB funding serves as an instrument of empowerment, enabling educational leaders to respond proactively to the evolving needs of their schools and pave the way for enhanced student success.

Flexibility allows principals to respond to shifting demographics and evolving student profiles. For example, Principal Fulton at a high-dosage school states, "Literally every new kindergartner, literally every new kindergartner that we've gotten since school opened that enrolled after school started, they've all been EL." Fulton, like other principals, has seen a shift in student demographics, leading to an increase in students with higher educational needs. With the flexibility provided by additional SBB funding, however, schools can adapt and invest more heavily in the required resources, such as hiring more EL teachers. As Principal Fulton states, "This year I really heavily invested in EL. I invested a lot of more money than normal in EL, because I wanted every grade level to have their own EL teacher, their own EL support person, because that was a very high request on my staff budget survey, and our EL population is growing."

Not only does flexibility pave the way for addressing diverse student needs, but it can also cater to the growth and development requirements of the teaching staff. For example, for younger or inexperienced staff, targeted funds can be used for specialized professional development. Principal Fulton states, "…if you have a younger staff or an inexperienced staff, you can target funds for specific professional development that they might need." Developing the instructional capacity of inexperienced teachers to better meet students' educational needs can have a positive impact on student outcomes.

High-dosage SBB funding can serve as a powerful tool for educational leaders to exercise greater control and adaptability in the allocation of resources. This flexibility enables them to respond effectively to shifting demographics, evolving student profiles, and the unique needs of their schools. It empowers them to make informed decisions, invest strategically, and enhance the overall quality of education. Furthermore, the funding's ability to support professional development for teachers, especially those who are younger or less experienced, can contribute to improved student outcomes.

Constraints of Limited Flexibility

Low-dosage schools, burdened by limited funding and constrained flexibility, face challenges in adapting to shifting enrollment and demographics. All principals in low-dosage schools mentioned inadequate resources to meet student needs. Principal Porter's frustration with their lack of control over the budget is evident as he remarks, "We don't have complete control over it...I wish I could've had some of that money, too." Principal Jones, at another low-dosage school, echoes a similar sentiment, emphasizing the overarching need for increased financial support, stating, "It would be great if we had more money in general." Principal Grant also sheds light on the limited financial resources, sharing, "It's like bare bones, but just enough to get you

by." The inability to address all their school needs is an ongoing concern, as Principal Grant notes, "the funds do not go that far," and Principal Porter highlights the yearly necessity for budget adjustments, underscoring the perennial challenge of meeting required staffing positions.

Principal Hayes provides further insight into the stark reality that many low-dosage schools face, noting, "Once you start paying out salaries and doing your mandatory stuff, you don't have as much money as you think." The struggle extends to basic supplies, as Principal Clark laments, "It's been very lean; we barely could buy paper." This resource scarcity hits particularly hard in small schools with high needs, as Principal Clark emphasizes, "I don't get adequate funds to really meet all the needs of the students that I have." These narratives underscore the challenges faced by low-dosage schools in effectively responding to evolving student demographics and needs, which could explain the disparate outcomes observed between high-dosage schools and low-dosage schools.

The narratives from principals of low-dosage schools paint a clear picture: resource constraints significantly hinder their ability to adapt and respond to the evolving needs of their student population. Limited funding and stringent budgetary controls consistently emerge as dominant themes across their experiences. The recurring lamentations about inadequate funds indicate a systemic issue where financial scarcity limits their capacity to invest in necessary resources, tools, or personnel. The genuine struggle, even for basic supplies, speaks to the severity of the problem for some low-dosage schools. Furthermore, the fixed costs associated with mandatory expenditures, such as salaries for required personnel, further constrict the already limited fiscal space for other critical needs. This ongoing battle of stretching limited resources to meet the diverse and pressing needs of students, as portrayed by these principal accounts, offers a compelling explanation for the observed differences in outcomes between

high-dosage and low-dosage schools. When schools are trapped in a cycle of scarcity, their ability to innovate, adapt, and provide comprehensive support to students is inevitably compromised.

Focusing on People First Resource Allocations

In both high-dosage and low-dosage schools, principals uniformly recognize the importance of prioritizing personnel in their resource allocation decisions. Principal Clark at a high-dosage school emphasizes this perspective, stating, “So just as a faculty and staff, we believe that people are what move the work… it’s always going to be people first.” Similarly, Principal Baker at a high-dosage school speaks to a similar sentiment, explaining, “Like I said, I set aside money for my first priority, which is always people.” These narratives underscore a shared understanding that educators and staff members are the driving force behind educational progress.

Building on this perspective, both Principal Davis and Baker highlight how focusing on people allows them to provide students with smaller classes and more effectively meet student needs. Principal Baker emphasizes the importance of classroom sizes that are “very manageable.” Principal Davis also speaks to the importance of smaller class sizes, by stating “…having smaller class sizes is really key so we tend to prioritize that.” This perspective reflects a recognition that smaller class sizes facilitate more personalized instruction and enhanced learning experiences, which necessitates focusing on prioritizing personnel allocations in resource decisions.

Similarly, in low-dosage schools, principals also adopt a people-first approach to resource allocation. Principal Jones articulates a preference for investing in the right personnel rather than programs, emphasizing, “I’m going to be someone that’s a people versus programs

type thing, right. But I think we're going to get more if we have the right people in those spots. Even if it's partial people or partial positions, I think we're going to get more out of that." This perspective, like those of the high-dosage principals, underscores the belief that skilled educators and staff members are instrumental in enhancing educational quality, regardless of budget constraints. Principal Porter further reinforces this notion, acknowledging, "It is always personnel first because it doesn't matter if you have the supplies or materials, if you don't have the people to implement it then…so our priority is personnel." This shared prioritization of personnel resources in low-dosage schools highlights their commitment to leveraging their budgetary allocations effectively to support educators and ultimately improve student outcomes similar to schools with greater SBB resources.

Across both high-dosage and low-dosage schools, principals emphasize that when they prioritize personnel, it results in more effective and tailored educational experiences for their students. High-dosage schools, with their increased SBB funds, possess greater flexibility in their budgetary decisions. This financial flexibility grants them a heightened ability to allocate resources toward personnel, leading to potentially enhanced student outcomes and growth over time. However, it's noteworthy that even in the face of financial constraints, low-dosage schools also underscore the primacy of personnel, demonstrating a shared belief that investing in the right educators and staff members can drive quality education. In essence, while financial flexibility from higher SBB funds offers advantages to high-dosage schools that may be more likely to lead to improved student outcomes in these schools, the universal emphasis on personnel as a cornerstone for student success remains a shared and pivotal strategy across both school types.

Navigating the Budgetary Process

Many newer principals in high-dosage schools faced challenges due to a lack of budgeting guidance and prior experience in managing school budgets. Principal Miller's statement, "So as a new principal, I didn't get much training, I had to rely on my colleagues for that," underscores this point. Principal Smith echoes this, by stating, "But in the beginning, when I first came in, I did not have any experience with this, this was really, really difficult. Because I didn't have any experience with it…I didn't get a whole lot of guidance with it." This lack of training and guidance may have implications for resource allocation decisions and, consequently, student outcomes.

However, the lack of prior budgeting experience among newer principals in high-dosage schools may also have an unexpected benefit. Principal Hayes states, "It pushes new principals and puts them in a position where they may not know everything about a school to think strategically, but I also see that as a pro too. Because while it could give a new principal something else to learn, I think it also gives a new principal the thought process of, 'Hey, I need to be strategic. I need to innovate.'" The lack of budgeting guidance can push new leaders to think more strategically and foster a sense of innovation. This innovative thinking is reflected in their willingness to explore non-traditional resource allocations to meet student needs, as highlighted by Principal Miller's decision to have a health teacher and Principal Davis's investment in a Dean of Students, both of which were uncommon allocations at the elementary school level. These innovative approaches suggest that newer principals, unburdened by traditional practices, are more open to experimentation, potentially resulting in novel and effective strategies for student success.

Conversely, experienced principals at low-dosage schools tend to rely on data-driven decision-making processes. Most principals in low-dosage schools explicitly discuss their use of data in the resource allocation process. For example, Principal Fulton states, "Yeah, so I think it's all starting with, again, looking at our data, and what we have in front of us and what we see...What is this telling us that the kids need that we need in order to, to make sure that they can continue to improve and support them in that way?" Principal Grant echoes this and states, "looking at our data, which choice do we need to go with?" This focus on data-driven decision-making is prevalent among more experienced leaders, helping them allocate resources based on tangible evidence of student needs. This approach may contribute to improved outcomes in areas where data can inform targeted interventions.

The mechanisms at play in high-dosage and low-dosage schools highlight the potential impact of budgeting guidance, leadership experience, and innovative resource allocation on student outcomes. While less experienced principals in high-dosage schools may face challenges due to limited budgeting experience, their willingness to innovate can lead to unique and effective resource allocations. In contrast, experienced leaders in low-dosage schools leverage data to guide their decisions, potentially contributing to targeted interventions and improved outcomes in other areas. These mechanisms provide valuable insights into the complexities of school budgeting and its influence on student outcomes.

Student Learning Loss Resulting from COVID-19

The COVID-19 pandemic disrupted principals' ability to provide additional resources and interventions to support student growth. Principal Baker, at a high-dosage school, discussed how COVID-19 restrictions made it challenging to organize small-group sessions and after-school tutoring. She states, "But when it came to additional resources that we need, that we knew

we needed to help our students grow, being able to get them into small groups was not really an option, because they couldn't physically be that close to each other. Having after-school tutoring, and meetings with small groups of students wasn't possible because of COVID." These resources were essential for addressing individual student needs. This disruption in resource allocations points to a key mechanism through which the pandemic may have adversely affected student outcomes. The inability to provide targeted, in-person support may have hindered student progress, particularly for those who require additional assistance.

Principal Smith also underscores how COVID-19 exacerbated disparities in technology access and digital literacy among students and their families. The pandemic necessitated the use of laptops for students to engage in remote learning, but this alone was insufficient. Many students lacked the digital literacy skills required to effectively utilize these resources, and their families were similarly ill-equipped to provide support. Principal Smith states, "COVID affected it tremendously, because we had parents who don't really even know the difference between internet and the phone, and 5g and all that stuff. So we had to really think about, not only do students need laptops to take home, because they don't have them at home. But they don't know how to use them. And their families can't support them in that use, because they know even less than the kids do." This highlights the potential long-term impact of COVID-19 on student outcomes, as the digital divide and learning gaps created or exacerbated during the pandemic may persist, especially among students in higher need, high-dosage schools.

Similarly, Principal Fulton at another high-dosage school highlights the uncertainty surrounding the lasting effects of COVID-19 on students. While the immediate impact of the pandemic is evident, the long-term consequences on students' verbal skills and overall academic development remain uncertain. She states, "Their verbal skills are lacking, and that's not

something we're going to fix in a year… So the after effects, we don't know how long the after effects of COVID is going to be on kids." The uncertainty and potential long-term effects of the pandemic offer insight into the lack of statistically significant positive student outcome results in the years after the start of the COVID-19 pandemic.

Minimizing Funding Constraints through ESSER Funding

Due to COVID-19, schools received increased funding to help address student needs, which the principals in both groups expressed was beneficial. Low-dosage schools, in particular, expressed how ESSER allowed them to have the flexibility that SBB had not afforded them. For example, Principal Clark states in reference to ESSER, "I'll be honest, this is the first year coming, the year we're getting ready to move into, where I've had enough money to go in above and beyond to really feel that it is equitable to the clients that I serve. And that's because we've gotten a lot of COVID money." Principals across both groups of schools used ESSER funding to hire additional personnel (e.g., full-time translators, numeracy coach, after-school tutors) and pay for non-personnel expenses (e.g., technology, intervention programs, and supplies) as well as build the capacity of teachers through additional PD and EL certifications.

This supplementary ESSER funding had a notable impact on the resource allocation decisions made by principals in both high and low-dosage schools. While the additional funding proved beneficial across the board, it was the low-dosage schools that particularly highlighted the flexibility and financial relief that ESSER provided. In addition to investing in critical personnel and non-personnel supplies and resources, there was emphasis on bolstering teacher capacities through professional development and EL certifications. Critically, for low-dosage schools, the ESSER funding served as a financial catalyst, minimizing some of the constraints they had grappled with in previous years of SBB. This influx of resources potentially provided

these schools with the opportunity to make strides in their educational endeavors, further enabling them to address student needs more comprehensively. This newfound financial flexibility in low-dosage schools may also shed some light on the absence of statistically significant results in the study post-COVID-19. Thus, the possible convergence in outcomes might be attributed to the increased financial capabilities, enabling low-dosage schools to more effectively meet student needs and potentially elevate their students' educational experiences.

Discussion and Conclusion

Our study stands as one of the first studies to examine the causal impact of SBB, which is the combination of weighted student funding and site-based budgeting (flexibility). Overall, we find that test score outcomes improved in both math and ELA, but we did not find strong evidence for changes in discipline outcomes and absences. Our heterogeneity analysis shows that ED and ELL students in high-dosage schools had improved outcomes relative to students of the same demographic background in low-dosage schools. These findings underscore the potential for SBB to address educational disparities among traditionally marginalized student groups. Our qualitative findings lend further support to these results.

Our qualitative examination of student-based budgeting and its influence on student outcomes has shed light on the distinctive challenges and advantages faced by both high-dosage and low-dosage schools. High-dosage schools, characterized by principals deeply connected to their student body, underscore the significance of a customized approach to education. This tailored approach frequently materializes through strategic resource allocation, facilitated by enhanced budgetary flexibility. The augmented flexibility observed in high-dosage schools plays a pivotal role in ensuring that the multifaceted needs of students are met, thereby creating an environment conducive to improved student outcomes.

Conversely, low-dosage schools emphasize the obstacles they encounter due to financial constraints, which can potentially impede student growth within these schools. The principal accounts from low-dosage schools underscore the profound impact of limited resources, vividly portraying the challenges they confront in adapting to the evolving needs of their students. This persistent financial struggle may offer insight into the observed disparities in outcomes between the two categories of schools.

Moreover, the significant impact of the COVID-19 pandemic, coupled with the subsequent infusion of ESSER funding, has added an additional layer to understanding the influence of SBB on student outcomes. While the immediate repercussions of the pandemic are evident, there remains uncertainty regarding its long-term effects on students. The supplemental ESSER funding, particularly beneficial to low-dosage schools, enabled schools to more effectively address student needs. This infusion of resources could potentially account for the lack of pronounced differences in student outcomes between the two school types in the post-pandemic era.

Our research provides a comprehensive understanding of the impact of SBB on student outcomes, emphasizing the need for equitable resource allocation and tailored approaches to education. These findings hold significant implications for policymakers and educational leaders striving to improve educational outcomes and reduce disparities in our education system.

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Tables

Table 4-1. Descriptive Statistics

	Dose=0	D=1	Full Sample
A. Demographic Characteristics			
Economic Disadvantage (ED)	0.700	0.791	0.765
	(0.458)	(0.406)	(0.424)
English Language Learner (ELL)	0.180	0.374	0.318
	(0.385)	(0.484)	(0.466)
Special Education (SPED)	0.131	0.108	0.115
	(0.337)	(0.311)	(0.319)
Female	0.489	0.489	0.489
	(0.500)	(0.500)	(0.500)
White	0.392	0.342	0.357
	(0.488)	(0.474)	(0.479)
Asian	0.0356	0.0445	0.0419
	(0.185)	(0.206)	(0.200)
Black	0.431	0.343	0.368
	(0.495)	(0.475)	(0.482)
Hispanic	0.138	0.267	0.230
	(0.345)	(0.442)	(0.421)
American Indian	0.00156	0.00180	0.00173
	(0.0395)	(0.0424)	(0.0416)
Pacific Islander	0.00146	0.00153	0.00151
	(0.0382)	(0.0390)	(0.0388)
N. Observations	39,697	97,700	137,397
B. Test Scores (3rd and 4th Grade)			
Standardized Math Score	0.0257	-0.229	-0.155
	(1.051)	(0.978)	(1.007)
Standardized ELA Score	0.0211	-0.209	-0.142
	(1.083)	(1.002)	(1.032)
N. Observations	12,088	29,285	41,373
C. Discipline			
In-School Suspension (ISS)	0.000907	0.000952	0.000939
	(0.0301)	(0.0308)	(0.0306)
Out-of-School Suspension (OSS)	0.0494	0.0279	0.0342
	(0.217)	(0.165)	(0.182)
N. Observations	39,693	97,694	137,387
D. Attendance			
Absence Percentage Rate	5.699	4.974	5.183
	(9.093)	(7.248)	(7.833)
Unexcused Abs. Percentage Rate	3.108	2.350	2.569
	(8.477)	(6.392)	(7.066)
N. Observations	39,667	97,666	137,333

Table 4-2. Descriptive Characteristics of Principals in Qualitative Sample

SBB Type	Pseudonym	Prior Budgeting Experience	Years as Principal	Total Years in Education
D=1 (High Dosage)	Baker	Yes	3	14
	Taylor	No	3	17
	Davis	No	3	13
	Miller	No	4	22
	Fulton	No	7	27
	Smith	No	20	35
		Avg. (SD)	6.67 (6.71)	21.33 (8.5)
D=0 (Low Dosage)	Jones	No	5	12
	Hayes	Yes	7	17
	Porter	Yes	15	19
	Clark	Yes	16	33
	Grant	No	20	32
		Avg. (SD)	12.6 (6.35)	22.6 (9.4)

Table 4-3. Test Score Outcomes on 3rd and 4th Grade State Assessments

	Math		ELA	
	(1)	(2)	(3)	(4)
A. Dynamic Results:				
2-year exposure (2017)	0.20*	0.18*	0.16**	0.14**
	(0.081)	(0.079)	(0.058)	(0.054)
3-year exposure (2018)	0.23*	0.21*	0.14+	0.12+
	(0.090)	(0.092)	(0.073)	(0.071)
4-year exposure (2019)	0.20	0.18	0.16*	0.15+
	(0.12)	(0.12)	(0.080)	(0.079)
6-year exposure (2021)	0.20	0.17	0.19+	0.16
	(0.18)	(0.18)	(0.11)	(0.12)
7-year exposure (2022)	0.29	0.27	0.19	0.18
	(0.21)	(0.21)	(0.13)	(0.13)
Adj. R2	0.18	0.28	0.19	0.29
N. Schools	61	61	61	61
N. Obs.	91546	91546	91546	91546
B. Diff-in-Diff Estimates:				
DD: Pre-COVID	0.21**	0.18*	0.16**	0.13*
	(0.079)	(0.078)	(0.057)	(0.054)
DD: All Years	0.18*	0.15+	0.13*	0.11*
	(0.089)	(0.084)	(0.059)	(0.055)
C. Regression Controls:				
School FEs	X	X	X	X
Year FEs	X	X	X	X
Grade FEs	X	X	X	X
School-by-Year Trends	X	X	X	X
Grade FEs-by-Student Cntrls.		X		X
D. Outcome Baseline Mean:				
Dosage = 1 in 2014-15	-0.31		-0.27	

Notes: Robust standard errors, clustered at the school level are reported in parentheses. Statistical significance levels: + $p< 0.10$; * $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table 4-4. Discipline Outcomes

	ISS		OSS	
	(1)	(2)	(3)	(4)
A. Dynamic Results:				
1-year exposure (2016)	-0.0034	-0.0034	0.00026	0.00042
	(0.0028)	(0.0028)	(0.0077)	(0.0077)
2-year exposure (2017)	-0.0014	-0.0014	-0.0022	-0.0016
	(0.0013)	(0.0014)	(0.0084)	(0.0085)
3-year exposure (2018)	-0.0081	-0.0080	-0.011	-0.010
	(0.0089)	(0.0089)	(0.0099)	(0.0098)
4-year exposure (2019)	-0.0029	-0.0028	-0.0031	-0.0027
	(0.0044)	(0.0044)	(0.010)	(0.010)
5-year exposure (2021)	-0.00022	-0.00019	-0.0038	-0.0039
	(0.0029)	(0.0029)	(0.012)	(0.012)
6-year exposure (2021)	-0.0017	-0.0016	-0.0049	-0.0051
	(0.0018)	(0.0018)	(0.013)	(0.013)
7-year exposure (2022)	0.0014	0.0014	-0.012	-0.012
	(0.0031)	(0.0031)	(0.014)	(0.014)
Adj. R2	0.014	0.017	0.033	0.054
N. Schools	61	61	61	61
N. Obs.	347,774	347,774	347,774	347,774
B. Diff-in-Diff Estimates:				
DD: Pre-COVID	-0.0027	-0.0027	-0.00026	0.00012
	(0.0029)	(0.0029)	(0.0077)	(0.0077)
DD: All Years	-0.0057	-0.0056	0.00055	0.0013
	(0.0036)	(0.0036)	(0.0085)	(0.0085)
C. Regression Controls:				
School FEs	X	X	X	X
Year FEs	X	X	X	X
Grade FEs	X	X	X	X
School-by-Year Trends	X	X	X	X
Grade FEs-by-Student Cntrls.		X		X
D. Outcome Baseline Mean:				
Dosage = 1 in 2014-15	0.0015		0.026	

Notes: Robust standard errors, clustered at the school level are reported in parentheses. Statistical significance levels: + $p< 0.10$; * $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table 4-5. Attendance Outcomes

	Absence Rate (%)		Unexcused Abs. Rate (%)	
	(1)	(2)	(3)	(4)
A. Dynamic Results:				
1-year exposure (2016)	0.67+	0.71+	0.65	0.67+
	(0.40)	(0.41)	(0.40)	(0.40)
2-year exposure (2017)	1.12*	1.31**	1.03*	1.16*
	(0.49)	(0.50)	(0.46)	(0.47)
3-year exposure (2018)	0.74	0.97*	0.86+	1.01+
	(0.46)	(0.47)	(0.52)	(0.53)
4-year exposure (2019)	1.10*	1.32*	1.26*	1.39*
	(0.52)	(0.54)	(0.58)	(0.59)
5-year exposure (2020)	1.35*	1.60*	1.70**	1.84**
	(0.63)	(0.63)	(0.66)	(0.67)
6-year exposure (2021)	1.00	1.28	1.17	1.32
	(1.10)	(1.12)	(0.97)	(0.98)
7-year exposure (2022)	1.86*	2.16*	1.87*	2.03*
	(0.83)	(0.84)	(0.93)	(0.95)
Adj. R2	0.042	0.059	0.040	0.052
N. Schools	61	61	61	61
N. Obs.	347763	347763	347763	347763
B. Diff-in-Diff Estimates:				
DD: Pre-COVID	0.73+	0.78+	0.63	0.66+
	(0.41)	(0.41)	(0.38)	(0.38)
DD: All Years	0.49	0.54	0.44	0.49
	(0.38)	(0.37)	(0.35)	(0.34)
C. Regression Controls:				
School FEs	X	X	X	X
Year FEs	X	X	X	X
Grade FEs	X	X	X	X
School-by-Year Trends	X	X	X	X
Grade FEs-by-Student Cntrls.		X		X
D. Outcome Baseline Mean:				
Dosage = 1 in 2014-15	5.05		2.42	

Notes: Robust standard errors, clustered at the school level are reported in parentheses. Statistical significance levels: + $p< 0.10$; * $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table 4-6. Heterogeneity Analyses

	Math	ELA	ISS	OSS	Abs. Rate	Unex. Abs.
	(1)	(2)	(3)	(4)	(5)	(6)
Economically Disadvantaged:						
A. ED=0	0.077	0.094	-0.00056	-0.0055	0.68	0.62
	(0.12)	(0.062)	(0.0017)	(0.0048)	(0.58)	(0.56)
Baseline Mean	0.19	0.34	0.0024	0.012	4.24	1.65
N. Observations	37705	37705	54268	54268	54289	54289
B. ED=1	0.26***	0.15*	-0.0069	-0.011	-0.16	-0.17
	(0.078)	(0.061)	(0.0051)	(0.014)	(0.34)	(0.30)
Baseline Mean	-0.44	-0.43	0.0025	0.034	5.44	2.58
N. Observations	53841	53841	84368	84368	84401	84401
English Language Learner:						
A. ELL=0	0.12	0.094	-0.0058	-0.0060	0.39	0.29
	(0.096)	(0.062)	(0.0044)	(0.011)	(0.41)	(0.36)
Baseline Mean	-0.26	-0.11	0.0038	0.041	5.70	2.77
N. Observations	58074	58074	88218	88218	88246	88246
B. ELL=1	0.23**	0.22**	-0.00024	-0.0049	-0.81	-0.57
	(0.077)	(0.070)	(0.0015)	(0.0082)	(0.55)	(0.50)
Baseline Mean	-0.38	-0.52	0.00054	0.012	4.36	1.77
N. Observations	33472	33472	50418	50418	50444	50444
Special Education Student:						
A. SPED=0	0.14+	0.12*	-0.0034	-0.0077	-0.012	-0.042
	(0.084)	(0.053)	(0.0028)	(0.0083)	(0.31)	(0.26)
Baseline Mean	-0.19	-0.17	0.0021	0.025	5.02	2.32
N. Observations	81807	81807	122508	122508	122544	122544
B. SPED=1	0.20	0.064	-0.0099	0.0036	0.86	0.87
	(0.12)	(0.12)	(0.0095)	(0.027)	(0.86)	(0.80)
Baseline Mean	-1.17	-0.99	0.0058	0.066	6.51	2.88
N. Observations	9739	9739	16128	16128	16146	16146

Notes: Robust standard errors, clustered at the school level are reported in parentheses. Statistical significance levels: + $p< 0.10$; * $p<0.05$; ** $p<0.01$; *** $p<0.001$. Each row denoted by A or B reflects a different regression that is conditional on the group indicated. For example ED=0 refers to non-economically disadvantaged students and ED=1 refers to economically disadvantaged students.

Table 4-7. Robustness Check: Demographic Changes

	Grades K-4		Grades 3-4	
	All Years	Pre-COVID	All Years	Pre-COVID
Economic Disadvantage (ED)	-0.0046	-0.019*	-0.0048	-0.019
	(0.015)	(0.0090)	(0.018)	(0.016)
Special Education (SPED)	-0.0039	-0.0045	-0.00036	-0.0054
	(0.0066)	(0.0054)	(0.0099)	(0.0089)
English Language Learner (ELL)	0.019+	0.0032	0.013	0.0070
	(0.0095)	(0.0071)	(0.011)	(0.010)
Female	0.0022	-0.0046	0.0026	-0.0059
	(0.0083)	(0.0077)	(0.015)	(0.018)
White	0.016+	0.000029	0.012	-0.0020
	(0.0092)	(0.0077)	(0.012)	(0.014)
Asian	0.0093**	0.0044*	0.0035	0.0060
	(0.0030)	(0.0019)	(0.0041)	(0.0047)
Black	-0.017	-0.0030	-0.012	-0.0043
	(0.012)	(0.0094)	(0.014)	(0.013)
Hispanic	-0.0095	-0.0020	-0.0030	0.0031
	(0.0099)	(0.0068)	(0.012)	(0.0097)
American Indian	0.0011*	0.00048	0.00037	-0.00087
	(0.00049)	(0.00042)	(0.0012)	(0.0013)
Pacific Islander	0.00027	0.000089	-0.00091	-0.0019
	(0.00059)	(0.00058)	(0.0012)	(0.0013)
N. Obs.	347,835	263,319	134,556	101,349

Notes: Robust standard errors, clustered at the school level are reported in parentheses. Statistical significance levels: + $p< 0.10$; * $p<0.05$; ** $p<0.01$; *** $p<0.001$. Each row reflects a separate regression where the outcome is a binary variable reflecting whether students are part of the indicated demographic category.

Table 4-8. Robustness Check: Test Score Missingness/Suppression

	All Years		Pre-COVID	
	DD Estimate	N. Obs	DD Estimate	N. Obs
All Students	0.012	109,566	0.0021	87,991
	(0.014)		(0.013)	
Economic Disadvantage (ED)	0.0023	67,284	-0.0059	58,424
	(0.020)		(0.018)	
Special Education (SPED)	-0.037	15,378	-0.016	12,505
	(0.032)		(0.040)	
English Language Learner (ELL)	0.017	39,501	0.028	30,113
	(0.016)		(0.028)	
Female	0.014	53,784	0.014	43,152
	(0.016)		(0.015)	
White	0.0042	36,102	-0.0092	29,864
	(0.019)		(0.017)	
Asian	-0.0023	4,919	0.063	3,844
	(0.042)		(0.068)	
Black	0.0085	39,214	-0.0043	32,344
	(0.023)		(0.025)	
Hispanic	0.026	28,942	0.038	21,643
	(0.023)		(0.028)	
American Indian	-0.37	196	0.37	150
	(0.51)		(0.63)	
Pacific Islander	0.60	169	0.50	122
	(0.52)		(1.01)	

Notes: Robust standard errors, clustered at the school level are reported in parentheses. Statistical significance levels: + $p< 0.10$; * $p<0.05$; ** $p<0.01$; *** $p<0.001$. Each row reflects a separate regression where the outcome is a binary variable reflecting whether the student in each of the demographic groups is missing a test score.

Figures

Figure 4-1. Dosage Group Characterization

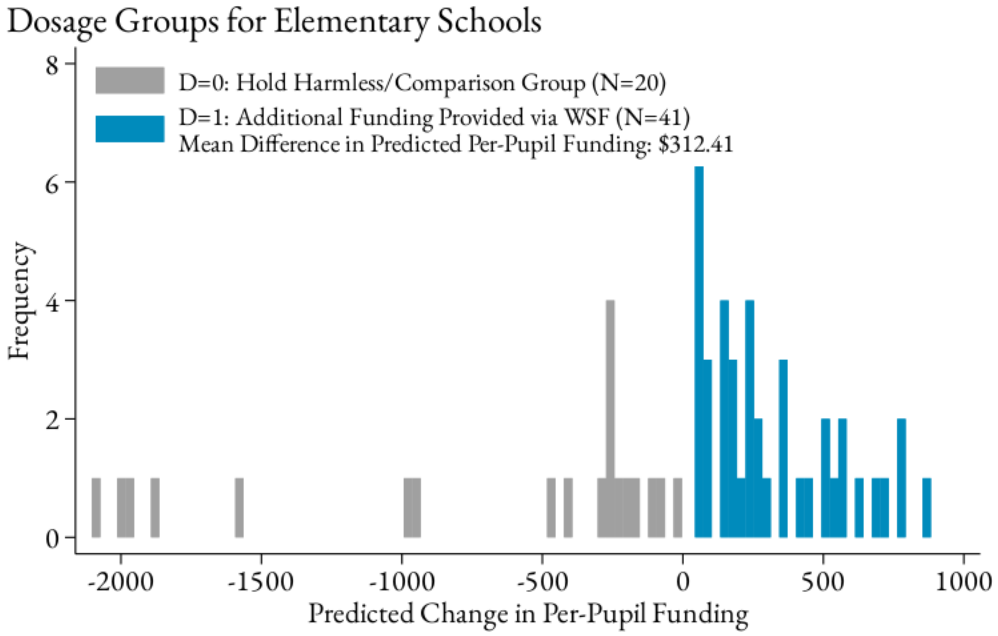
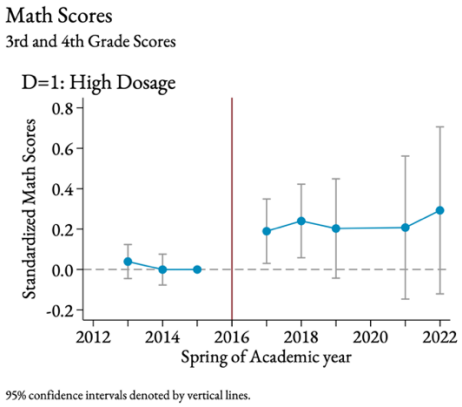
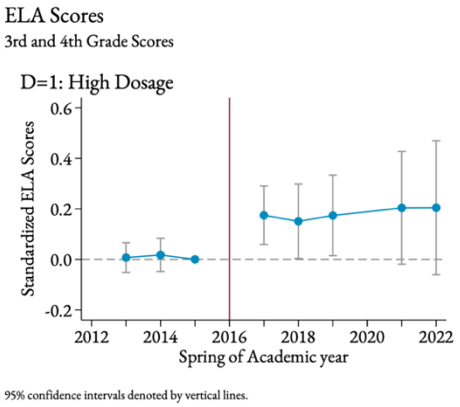


Figure 4-2. Event Studies

Panel A. Test Score Outcomes

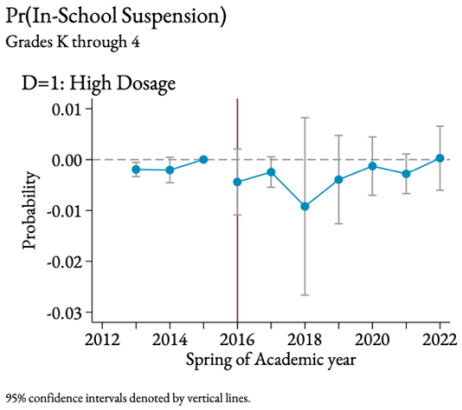


(a)



(b)

Panel B. Discipline Outcomes



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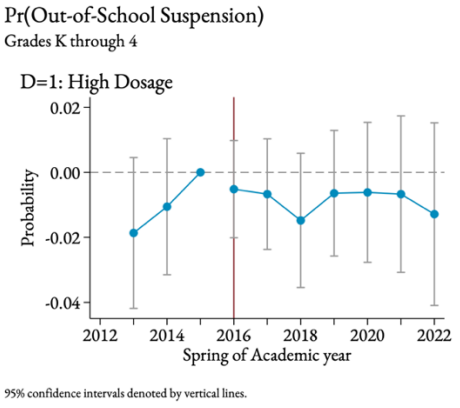
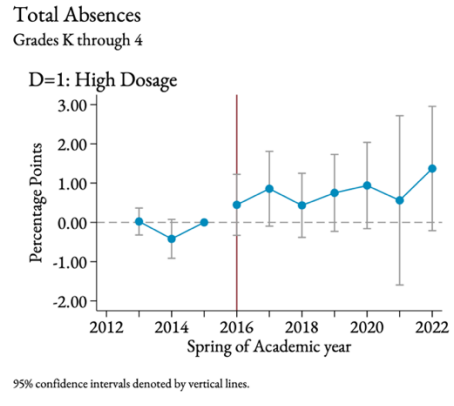
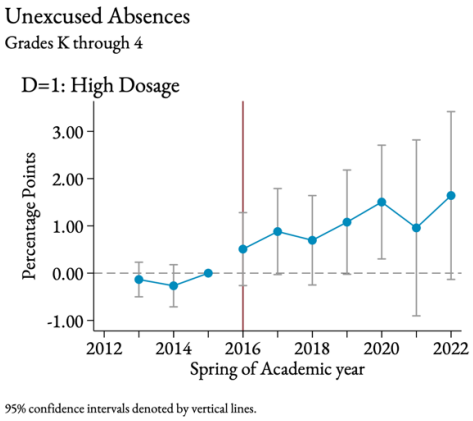


(b)

Panel C. Attendance Outcomes



(a)



(b)

Chapter 5

Conclusion

The preceding chapters explored key facets related to educational equity, resource management, and their profound implications for student outcomes within the contexts of MNPS and SCS after the implementation of student-based budgeting. This concluding chapter highlights major findings and insights garnered from the in-depth analyses across these chapters, emphasizing the intricate interplay between resource allocation, leadership practices, and student outcomes.

In Chapter 2, the evaluation of weighted student funding on resource equity and outcome-based equity in MNPS and SCS revealed a complex picture with both progressive and regressive trends in spending. While the causal analysis did not yield statistically significant results regarding the impact of WSF on student outcomes, the descriptive analysis provided important insights into the allocation of resources for historically underserved student subgroups. This analysis indicated potential equitable spending for economically disadvantaged students and students with disabilities, suggesting a progressive trend in funding for these groups across fiscal years.

However, the regressive trend observed in the spending on ELL students, particularly in MNPS, may warrant further investigation and potential policy adjustments. The potential causes of this trend, whether linked to the formula's indirect progressivity, student mixing, data accuracy, or policy implementation, require careful scrutiny to ensure that ELL students receive the support and resources they need to thrive academically.

The findings related to inter-district resource equity also highlight the importance of considering local contexts and alternative fiscal and administrative strategies in achieving

resource equity. The example of Knox County, which demonstrated notable resource progressivity without strict adherence to the WSF model, suggests that a holistic approach to educational funding, tailored to specific district needs and conditions, may also be effective in promoting resource equity. However, the absence of pre-WSF fiscal data poses challenges in fully assessing WSF's impact on resource equity in MNPS and SCS, emphasizing the need for continued research and a nuanced understanding of the dynamics of educational funding.

In Chapter 3, the multiple case study approach highlighted the multifaceted nature of equity-focused resource management among school principals within MNPS. While a shared conceptualization of equity serves as the foundation of their efforts, it is evident that the practical application of equity in resource allocation is far from uniform. The principals showcased a range of approaches, reflecting varying degrees of equity-focused orientations across different dimensions of their resource management processes. This variety underscores the complexity and dynamic nature of equity in practice, emphasizing that there is no one-size-fits-all solution for achieving equitable outcomes in education.

The findings from this study also carry implications for both policy development and principal preparation programs. For example, flexibility in resource allocation, combined with transparency and stakeholder inclusion, should be emphasized in education policies. Additionally, principal preparation programs should go beyond theoretical understandings of equity and focus on preparing future school leaders to navigate the complex realities of implementing equity-driven decisions. This could involve experiential learning opportunities, a holistic perspective on student success, and training modules on effective stakeholder engagement and data-driven decision-making. By embracing these areas, school leaders and

policymakers can better navigate the evolving landscape of educational leadership and meet the diverse needs of students, ultimately fostering a more equitable and inclusive educational system.

In Chapter 4, the mixed-methods study offers valuable insights into the impact of SBB on student outcomes. This research is among the first to provide causal evidence of how SBB influences student outcomes. The findings reveal a positive effect on test score outcomes, with particularly notable improvements for economically disadvantaged and English language learner students in high-dosage SBB schools. This highlights the potential of SBB to reduce educational disparities among traditionally marginalized student groups.

Qualitative analyses further illuminate the complex landscape of SBB, highlighting the customized and strategic resource allocation practices, made possible by budgetary flexibility, in high-dosage schools. Conversely, low-dosage schools face formidable challenges due to financial constraints, impeding their ability to meet evolving student needs effectively. The COVID-19 pandemic and the infusion of ESSER funding have added a unique dimension, suggesting that the pandemic and additional resources may play a role in both exacerbating and mitigating disparities. Like prior findings, these findings also emphasize the need for equitable resource allocation and tailored educational approaches to address student disparities effectively. Policymakers and educational leaders can draw on these insights to inform strategies aimed at improving student outcomes and promoting equity in education.

The influence of student-based budgeting on resource and outcomes-based equity is multifaceted and requires ongoing research. The reflections and findings presented in these essays serve as valuable contributions to this evolving discourse. They not only shed light on the successes and challenges faced by different SBB districts but also provide insights that can help guide future policy and practice.