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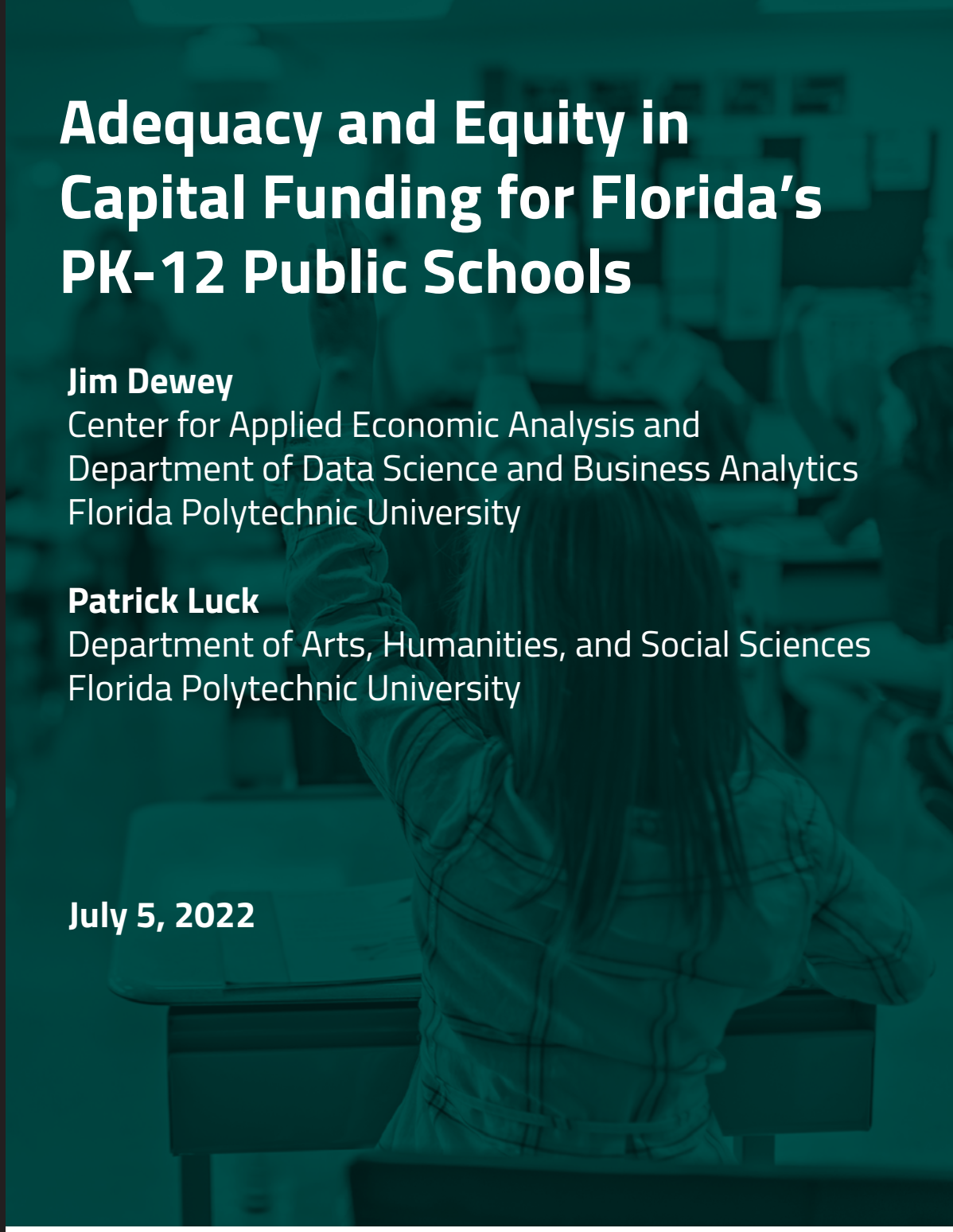
# Adequacy and Equity in Capital Funding for Florida's PK-12 Public Schools



**Jim Dewey**
Center for Applied Economic Analysis and
Department of Data Science and Business Analytics
Florida Polytechnic University

**Patrick Luck**
Department of Arts, Humanities, and Social Sciences
Florida Polytechnic University

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Dewey is the primary author, and any remaining errors are his alone. Luck prepared the first draft of major portions of sections 6 and 10, served as a sounding board as other portions of the report were conceptualized, and contributed significantly to editing of the final draft.

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# 1. Background and Executive Summary

The requirement to ensure all public-school students in Florida have equitable access to adequate educational resources is enshrined in Article IX, Section 1 (a) of the state constitution, which begins as follows:

> The education of children is a fundamental value of the people of the State of Florida. It is, therefore, a paramount duty of the state to make adequate provision for the education of all children residing within its borders. ***Adequate*** provision shall be made by law for a ***uniform***, efficient, safe, secure, and high quality system of free public schools … (emphasis added)[1]

Adequacy, viewed broadly, means sufficient funding is available to provide each student access to a level of educational resources deemed acceptable to Floridians for that student. This reflects individual value judgements about what constitutes adequate. Surely it means different things to different people, making it impossible to quantify in a completely general way.

We may, however, take a narrower view and draw conclusions about whether funding is adequate relative to a predefined standard. We measure capital funding adequacy relative to two standards. First, we consider whether current capital funding is sufficient to meet minimum standards specified by the state. Second, we consider whether capital funding is sufficient to sustain capital at the level provided in the past, adjusted for changes in the drivers of citizen demand for educational resources. Adequacy relative to the past might be thought of as intertemporal equity: Does our current investment in the education of our children live up to that made by earlier generations? We also consider the sustainability of the major sources of capital funding since, if they erode over time, capital funding will eventually become inadequate unless capital funding finance mechanisms are changed.

For our purposes, uniform and equitable mean the same thing; resources are allocated so each district has the funding necessary to make substantively similar educational resources available to similarly situated students. As described in the Florida Department of Education's annual publication *Funding for Florida School Districts*, the Florida Education Finance Program (FEFP) was established by the Florida legislature in 1973 as the primary mechanism for funding what are considered the *operating* costs of Florida's school districts. The FEFP allocates operating funding on a per student basis, adjusting the state portion of funding to compensate for differences across districts in the property tax base and for factors related to student body composition and location that drive differences in the cost of providing a uniform education. Capital resources, however, are not equalized in any similar way. Since access to things like classrooms, computers, and school busses is essential, any resulting inequity would seem to violate the constitutional requirement for uniformity. We quantify inequity in capital funding across districts and identify its major drivers.

Having measured inadequacy and inequity in Florida's support for school capital and having identified their sources in existing mechanisms of finance, we also consider how these mechanisms and the resulting capital funding fit within the broader context of public school funding in Florida. Finally, we consider how these funding mechanisms might be modified to redress both inadequacy and inequity in capital funding.

[1] Constitution of the State of Florida. Accessed May 24, 2022, at http://www.leg.state.fl.us/statutes/index.cfm?submenu=3

### 1.1. Main Findings

Our major findings are as follows.

- Capital funding is inadequate given state standards. As of 2018-19 an additional $1,207 per student in sustainable funding was needed to adequately fund capital, or $3.4 billion in total.
- The revenue streams behind the Public Education Capital Outlay (PECO) trust fund and Capital Outlay and Debt Service (CO&DS) trust fund, which have in the past provided considerable support for public school capital, have eroded significantly. PECO funding can cover only a small fraction of required capital expenditures, and sustainable CO&DS funding is all but negligible. Further, the ability of PECO and CO&DS, in their current forms, to support public school capital will continue to erode. Thus, as of 2018-19, an additional $0.3 billion was needed to eliminate reliance on these sources, bringing the need for additional sustainable revenue to $3.7 billion in 2018-19.
- Additional sustainable revenue needed to fund capital adequately relative to state standards and end reliance on eroding revenue sources will increase from 3.7 billion in 2018-19 to approximately $4.5 billion in 2023-24. Absent an overhaul of Florida's public finance system, the only individual tax bases up to this task are taxable sales and property values. However, effective property tax rates are already inefficiently high relative to the sales tax rate. Raising the additional revenue through the general sales tax, as opposed to reallocating from other uses or broadening the tax base, would require an increase in the tax rate from 6% to nearly 7%.
- Capital funding is inadequate relative to the past. Capital expenditure per student in 2018-19 was slightly less than in 2000-01 before adjusting for prices and income. After such adjustments, capital expenditure per student fell by $1,581 from 2000-01 to 2018-19. Allowing for debt finance and the average level of irregular revenue, and adjusting for changes in prices and income, regular capital revenue in 2018-19 was $1,257 per student short of what was needed to fund capital adequately relative to 2000-01, or $3.6 billion total. This regular revenue shortfall will grow to approximately $4.4 billion by 2023-24.
- There is considerable inequity in capital support across districts, driven by variation in taxable value per capita, students per capita, and capital costs. The student weighted standard deviation of potential capital per student across districts in 2018-19, adjusted for differences in capital cost and expressed in state average dollars, was $449, compared to a mean of $1,278. The 10$^{th}$ percentile, $880, was only half of the 90$^{th}$ percentile, $1,741. Sixty percent of the (student weighted) variation in potential capital resources across districts is predicted by variation in per capita income, with capital support per student increasing 0.93% for every 1% increase in income on average. Alternatively, seventy percent of the (student weighted) variation in potential capital resources across districts is predicted by variation in taxable value per capita, with capital support per student increasing 0.68% for every 1% increase in taxable value per capita on average. Students lucky enough to attend schools in wealthier districts, however measured, enjoy far more capital support than students in poorer districts.
- When we consider charter schools, formally as much a part of the public school system as are traditional public schools, the inequity grows. Traditional public schools receive more capital support than charter schools within districts. Real capital support for charter schools, as opposed to nominal funding, varies considerably across districts due to variation in the cost of

capital. The disparity between capital support for traditional public schools and charter schools also varies greatly across districts. Moreover, the capital support advantage for traditional public schools grows with the share of charter schools in district enrollment.

- It is possible to redress capital inequity in a revenue neutral way by incorporating it within the framework of the FEFP with minor modifications. This would significantly reduce resources available to students in property rich districts.
- Adequacy and equity may be simultaneously redressed by incorporating capital within the FEFP, with minor modifications, and increasing state FEFP funding by approximately 4.5 billion for 2023-24. If this were done, almost all districts would receive considerably more total state and local funding, though a few of the most capital rich districts would experience a reduction. To sustain adequacy, state funding must come from broad-based sources, for example the sales tax, and reliance on the narrow and eroding revenue streams that presently fund PECO and CO&DS must be eliminated.

Given that capital is essential to the provision of education, it is difficult to see how the large and systematic inequity in capital support can comport with the constitutional requirement for uniformity. The only apparent way to align capital funding with the state's constitution is to equalize real capital support per student across districts.

The implications of the finding that capital funding is inadequate relative to both current standards and past investments are less clear. Since judgement is involved in determining what adequate means, it is up to the legislature to set the bar for adequacy and provide funding accordingly. The issue raised herein is that at present funding is insufficient to sustain the bar that has been set. The solution might be to increase funding. We demonstrate how that might be accomplished and what it would cost. However, the solution might also be to lower the bar, for example weaking building codes so facilities could be built at a lower cost or reducing safety and security requirements. Some combination of the two might also be chosen. While how to address the imbalance is a political decision; our findings indicate the size and sources of the imbalance and may thereby be of use in determining how to address it.

### 1.2. Organization

The report is organized as follows. Sections 2-5 develop conceptual and analytical frameworks needed to evaluate the adequacy and equity of Florida's PK-12 capital funding. Section 2 provides background and clarification on the notions of equity and adequacy in school finance used herein. Section 3 discusses the role of capital in the provision of educational services and methods of capital finance. Section 4 develops a framework for conceptualizing and measuring the adequacy of capital funding. Specifically, a model of optimal dynamic capital budgeting appropriate to the PK-12 context is developed and used to characterize the level of funding needed to sustain any given capital standard. Section 5 develops benchmarks for the growth of capital funding needed to keep up with citizen demand for public school resources over time. These benchmarks are based on the standard economics of demand for any good or service and on published empirical studies of the specific drivers of the demand for public school funding.

Sections 6 and 7 gather and present revenue and cost data needed to operationalize the frameworks for quantifying the adequacy and equity of capital funding developed in earlier sections. Section 6 considers state and local sources of capital funding for Florida's schools.

Importantly, a distinction is made between regular and irregular sources of capital funding. Regular sources of capital funding are predictable and under the control of the state or the school board and thus can be counted on to fund regularly recurring capital needs. Irregular sources of capital funding are unpredictable or outside of the control of the state or the school board. We present data on the levels and trends of these funding streams over time and compare them with changes in capital funding benchmarks.

Sections 8 through 10 analyze adequacy and equity using the frameworks and data developed in previous sections. Section 8 presents the analysis of the adequacy of capital funding. Section 9 analyzes the equity of capital funding across districts and the underlying factors that drive inequity: variation in taxable value per capita, students per capita, and the cost of capital. Section 10 extends the analysis to consider the impact of charter schools, after first presenting relevant background on the nature, size, funding, and performance of Florida's charter schools.

Sections 11 and 12 consider methods of redressing inadequacy and inequity in capital funding, the impact of implementing such changes, and the way the issues identified in the report and the changes considered fit in the broader context of public school funding in Florida. Section 11 considers the impact of budget neutral capital funding equalization across districts and places these impacts within the broader context of the mechanism Florida uses to achieve uniformity, namely the FEFP. Section 12 considers the impact of simultaneously addressing adequacy and equity by substantially increasing state funding while also including capital funding in the FEFP and places our main findings in the context of broader concerns over the adequacy and equity of school funding in Florida. Section 13 concludes.

## 2. Adequacy and Equity in School Finance

Adequacy means each student has access to resources that are deemed to be adequate, or sufficient. Though the concept may seem simple, adequacy is incredibly complex as an empirical construct. Adequacy may be defined in terms of inputs directly, or it may be defined indirectly in terms of the outcomes that must be achieved from use of those inputs. In either case, asking the question "What is adequate?" presupposes one knows the answer to the question "Adequate to what end?" Answering that later question involves subjective value judgements.

If adequacy is defined in reference to outcomes, three empirical issues immediately arise. First, each individual Floridian may have a different notion of what constitutes an adequate outcome for any given student depending on their preferences, including their own notions of fairness.

Second, what is thought to constitute an adequate outcome for a student may vary with the characteristics of each student, and that variability will itself vary depending on each Floridian's opinion. Some Floridians may define outcomes conditional upon the effort the student expends, while others may think it is the job of the schools to ensure all students put in enough effort to reach their individually preferred outcome(s). The opinions of reasonable people differ on questions such as these.

Third, even if all Floridians agreed on what constitutes adequate resources for each individual type of student, we would need to know the relationship between school inputs and student outcomes for all types of students to know what level of resources was needed to achieve adequacy. This relationship, known as the education production function, has been extensively studied, but considerable uncertainty remains about the precise effects of various inputs on learning for different students and in different environments.[2]

Suppose instead we define adequacy in terms of resources directly, leaving any relation between those resources and outcomes implicit. Given their own thoughts about the relation of inputs to outcomes, what do individual Floridians think is an adequate set of resources for each type of student? The chief difficulty remains; adequacy is ultimately in the eye of the beholder.

In practice, judgements about adequacy are left to the legislature, whose decisions we hope reflect the values of the Floridians that elected them. Some Floridians will think too little is spent on education. Others will think too much is spent. While this method may be less than perfect, it is difficult to see another practical way to do it.

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[2] See, for example: 1) Hanushek, E. 2020, Chapter 13 - Education production functions. *The Economics of Education*. 2nd Edition. Academic Press Editors: Bradley, S. and Green, C. https://doi.org/10.1016/B978-0-12-815391-8.00013-6; 2) Hanushek, E. 1997, Assessing the Effects of School Resources on Student Performance: An Update. *Educational Evaluation and Policy Analysis*, 19(2): 141–164, https://doi.org/10.3102/01623737019002141; 3) Hedges, L. V., Laine, R. D., & Greenwald, R. 1994, Does Money Matter? A Meta-Analysis of Studies of the Effects of Differential School Inputs on Student Outcomes. Educational Researcher, 23(3): 5–14. https://doi.org/10.3102/0013189X023003005; and 4) Dewey, J., Husted, T., and Kenny, L. 2000, The ineffectiveness of school inputs: a product of misspecification? *Economics of Education Review*, 19(1): 27-45. https://doi.org/10.1016/S0272-7757(99)00015-1. For more extended discussion of adequacy and equity in school finance, see Bruce D Baker, 2018, *Educational Inequality and School Finance: Why Money Matters for America's Students*, Harvard Education Press, Cambridge, MA.

- *Determining whether a given level of resources is generally adequate at any point in time requires subjective individual judgement and is not amenable to objective quantitative analysis.*

The courts have reached a similar conclusion. In *Citizens for Strong Schools, Inc*. v. *Florida State Board of Education*, which went to trial in 2016, plaintiffs argued funding was inadequate. The trial judge ruled that the funding claim was non-justiciable and barred by separation of powers, for reasons substantially similar to the arguments made above. The Supreme Court of Florida upheld this ruling in 2019. However, it left open the possibility that narrower questions related to adequacy might be justiciable.[3]

The fact that we cannot quantify adequacy in general and absolute terms does not mean we will have nothing useful to say about it. We will consider two narrower, and complementary, questions. First, is capital funding sufficient to sustain the minimum standards for capital resources established by the state? If not, funding is inadequate relative to this standard.

- *If capital funding is insufficient to sustainably meet minimum standards set by the state, it is inadequate relative to the standard.*

Second, how has funding per student changed over time relative to underlying factors likely to shift what Floridians consider adequate? We will address adequacy relative to the level of capital support provided in the past. For example, if all factors that are likely to influence what individual Floridians view as adequate would have led to larger increases in funding from 2000 to 2020 than occurred, we can conclude that funding is relatively less adequate in 2020 than it was in 2000, as it would be viewed by the Floridians of the past. Relative adequacy in this sense might be thought of as a form of intertemporal equity—how does the investment we are making in our youth compare to those made by Floridians before us?

- *Adequacy relative to the past can be measured by comparing changes in funding over time to changes in accepted drivers of constituent demand for investment in education.*

In discussions of equity in school finance, horizontal equity means that similar students receive similar levels of resources. Applied at the district level, it means districts should receive sufficient funding to provide their students similar resources to those received by similar students in other districts. This concept of equity is clearly tied to the notion of uniformity in Florida's constitution and is used herein. Horizontal equity at the district level is relatively easily measured. We must simply measure the funding available per student and the cost of providing a standard bundle of educational resources in each location and divide the former by the latter. To the extent the resulting values differ, there is horizontal inequity.

There are aspects of horizontal equity that we do not take up, not because they are not important, but because they are beyond the scope of the report. Districts may not allocate resources equitably across schools within districts, leading to horizontal inequity between students within districts. Schools may not allocate resources equitably across students, leading to horizontal

[3] Lecker, W. and Levin, J. 2019. *Sharply Divided Florida Supreme Court Rules Broad School Funding Claim Not Justiciabl*e. Education Law Center. https://edlawcenter.org/news/archives/other-states/sharply-divided-florida-supreme-court-rules-broad-school-funding-claim-not-justiciable.html.

inequity within schools. However, we ignore questions related to intra-district facets of equity and focus on the way resources are allocated across districts. It is worth emphasizing that our focus is on resources, or nominal funding adjusted for differences in the costs of providing educational resources, not on nominal funding.

- *Inter-district horizontal inequity can be quantified by adjusting funding per student for differences in the cost of standard educational resources for each district and comparing the results across districts.*

There is an important linkage between horizontal equity and adequacy. Suppose funding is exactly adequate on average but inequitably distributed. Then funding will necessarily be inadequate in the districts that receive less than average resources. It follows that, for funding to be adequate at the lowest total cost, it must be equitably distributed. Inequitably distributed funding can be adequate in the districts receiving the least resources only if funding exceeds the minimally adequate level elsewhere.

- *To achieve adequacy in all districts at the minimum possible cost, the distribution of funding across districts must be must horizontally equitable.*

In addition to the relatively straightforward concept of horizontal equity, the concept of vertical equity may also arise in discussions of school finance. Specifically, funding is said to be vertically equitable if differences in the resources available to different types of students are considered reasonable given the differences between the students. We might devote more resources to students with various learning disabilities, or to students who otherwise face greater challenges in obtaining any given objective. This might mean a difference in resources large enough to equalize certain outcomes, to equalize certain outcomes conditional on sufficient student and parental effort, or that the inequality remaining in student outcomes or student opportunities is small enough to be acceptable. Vertical equity is related to adequacy in that adequate funding will support different levels of resources for students with different characteristics insofar as needed for each type of student to attain whatever is deemed adequate for similar students.

The FEFP contains elements whose purpose is related to this notion that adequate funding differs for different types of students or for students in different circumstances. For example, program cost factors are higher for students with disabilities. Some might argue the resulting funding is inadequate if it does not devote enough additional resources to improve outcomes for students with dyslexia, for example, to the level of students without dyslexia. However, the specifics of such arguments hinge on judgements about what adequate means for different types of students. Such judgements are inherently subjective when adequacy is defined broadly rather than relative to established and directly measurable standards. We will not consider whether adequate capital funding varies with student characteristics. Thus, vertical equity is not a separate independent concept for our purposes.

It is worth emphasizing that, for purposes of this report, we accept resource uniformity, or equity, as a requirement of the constitution and so a goal of policy. One could argue that complete resource equity is not desirable, and that, if choosing a distribution of educational resources from behind a Rawlsian veil of ignorance, few people would choose a distribution where resources were completely uniform. Suppose, for example, that there are only two districts, A and B, with equal numbers of students, and that education is twice as costly in A as in B. Since a given level of

funding buys more education in B, the average level of education is higher if dollars are split evenly rather than being allocated to equalize resources, in this case 12.5% higher. Those in A prefer equalized resources, and those in B prefer equal dollars but unequaled resources. However, consider someone who does not know if they will be in A or B, only that the average education is 12.5% better without equalization for any given tax burden. Which would they choose, equalized resources or equal dollars? That answer is unclear. In general, there is no reason to think individuals would choose a completely equalized, or uniform, resource allocation from behind a veil of ignorance, or even that they would choose to equalize nominal dollars. So, while we take uniformity as a requirement set out in the constitution, and a goal of policy, that does not imply it is unanimously accepted as the best possible policy.

To sum up, the central questions of adequacy and equity we consider are follows.

- **Adequacy Relative to State Standards**. *Is capital funding sufficient to sustain capital that meets minimum standards established by the state?*
- **Adequacy Over Time**. *How has per student funding changed over time relative to accepted drivers of the demand for education expenditures?*
- **Horizontal Equity**. *Does capital funding support provision of substantially similar capital services across districts?*

# 3. Capital in Education Production and Finance

Discussions of issues associated with capital finance can seem technical and arcane. Since capital assets are durable, such discussions may involve complex calculations over uncertain future horizons of indefinite length. Luckily, when it comes to consideration of the adequacy and equity of Florida's PK-12 capital funding, many of these complexities are of such minor practical importance that they can be set aside. However, if we ignore them without justifying why they may be set aside, readers who are aware of them and why they matter in other contexts may think we are oversimplifying or may be confused by the omission. In other cases, the implications of the issues and complexities are either quite subtle or are not what they might at first seem. The purpose of this section is to discuss these complexities insofar as needed to justify setting them aside, and to set forth, intuitively, the principles and relationships that are needed for our task.

### 3.1 The Flow of Capital Services is Essential to Production

Let us start by being explicit about the nature of capital and its role in education. Capital refers to anything produced not for immediate consumption but rather for use in the production of other things in the future. A mower used by a lawn service is capital. The production of education builds a form of capital, human capital, which makes the individual more productive in the future. Our focus is on physical capital, for example buildings, buses, and computers, not human capital.

It is common to distinguish between funding provided for capital and non-capital purposes by referring to funding for non-capital purposes as ***operating*** funding. The durability of capital assets coupled with questions related to the best method to finance procurement of capital services, which do not arise with other inputs, means the financial arrangements used to pay for capital may differ from those used to pay for other inputs. This in turn means the administrative requirements for overseeing the expenditure of public resources for capital purposes differ from the requirements for overseeing expenditure of resources for other inputs. There are numerous statutory distinctions in how capital funds are handled, and rules for when and how they may be spent. Capital funding is often broken into funding for fixed capital outlay and for maintenance. It is for all these reasons that the Florida Department of Education (FDOE) has an *Office of Fixed Capital Outlay*. However, these differences in rules and terminology may sometimes color thinking about capital funding in ways that are misleading or counterproductive.

Use of the word "fixed" relates to the fact that capital is by its nature durable and defined in part by its relationship to time. At any point in time existing assets that are used in the production process constitute the current ***stock*** of capital, which is fixed at that point in time. The stock of capital employed by a lawn service may include trucks, trailers, mowers, and any number of other tools designed to make those caring for lawns more productive in their work. But capital assets provide a ***flow*** of services over time. A mower may cut grass for many years. The potential volume of the flow of such services determines the ability of the lawn service to perform its functions. If the lawn service employs 5 mowers and no workers, no lawns will be mown. The services of workers are crucial to the flow of production. Similarly, if 10 workers but no mowers are employed, no lawns will be mown. Capital services are as essential to the operation of the lawn service as the services of workers.

Similarly, a classroom provides a hospitable place in which teachers can teach so that students may learn. A bus provides transport from home to school. The use of space or transport over time is the flow productive service provided by those capital assets. The ***flow*** of capital

services is a necessary input in the ***operation*** of schools. Schools cannot operate effectively without the services that flow from physical capital assets any more than they can operate effectively without teachers. In providing for an adequate and equitable system of free public schools, there is no more distinction to be made between spending on capital services and teachers than between spending on teachers and supplies or between teachers and bus drivers.

- *Regarding adequacy and equity in school finance, there is no relevant distinction between services flowing from capital and services flowing from other inputs, such as labor and materials. Uniformity requires equalization across districts of support for capital services in approximately the same way support for provision of the services of other inputs is equalized.*

Unfortunately, it seems this basic conclusion is sometimes obfuscated by differences in the mechanisms and terminology associated with the administration of capital finance, and capital services are treated in a qualitatively different manner than the services of other inputs. Support for teachers and bus drivers is equalized in Florida. Support for capital is not.

### 3.2 Asset Ownership versus Service Flow

Capital items are assets to their owners, who control how those services are employed over time. The owner of a lawn service decides when and how to deploy their capital to achieve their ends. That may include renting the capital out for someone else to use under conditions specified in a rental agreement. For production, of education or otherwise, it is not the ownership of the capital stock at a point in time that matters. What matters is the flow of capital services devoted to production of a product or provision of a service. A lawn service might own four mowers or lease four. What matters for cutting lawns on any given day is that they can deploy four mowers.

Similarly, a classroom provides an environment that is conducive to learning. Whether the classroom is owned by the district or by a property management company and leased by the district is beside the point for most questions of adequacy and equity. The relevant question is whether capital services are sufficient, not who owns the assets from which they flow.

- *Ownership of the capital assets from which educational services flow is of no direct importance for the adequacy or equity of capital services.*

### 3.3 Capital Outlay versus Maintenance Expenditures

Just as investment causes the stock of physical capital to increase, wear and tear causes the stock of capital to decline. The continual decline in the stock of capital due to wear and tear is called depreciation. While a well maintained and regularly repaired building may have a productive life of fifty years, a poorly maintained building may have a much shorter effective service life. Since expenditures on maintenance, upkeep, and repair reduce deprecation, they contribute positively to the size of the capital stock, and thus to the flow of services available to educate students.

Responsible stewards of public resources will invest in routine maintenance and repair to minimize the combined costs of performing maintenance and replacing capital as it wears out. Moreover, they will invest in maintenance up to the point where the impact of spending one more dollar on maintenance increases the capital stock exactly as much as spending the dollar on capital outlay. Imagine that given the current allocation, spending a dollar on maintenance to reduce wear and tear added less to the capital stock than simply purchasing another dollar of capital stock. Then the school should be spending less on maintenance and more on capital outlay, and vice-versa.

We will make frequent recourse to the assumption that behavior approximates that of an efficient optimizing school district. We don't mean to imply every district optimizes perfectly all the time. But the minimum level of funding needed to maintain adequacy occurs when the district optimizes, so this is a useful analytical device. It is worth noting that estimates of adequate funding made based on this assumption will tend to be conservative. That is, they will tend to be below the level of funding required for adequacy since it is impossible, in the real world, to always maintain perfect optimization.

- *Estimates of minimally adequate funding based on the assumption of continuously optimizing behavior by school districts will tend to be*
- *conservative.*

At the margin, for a responsible and optimizing steward of public resources, another dollar to spend on maintenance and another dollar to spend on capital outlay have the same impact on capital services. If they do not, resources are not being expended efficiently. Thus, distinctions between maintenance funding and funding for capital outlay can largely be ignored as they pertain to determining the adequacy and equity of aggregate capital funding.

- *The distinction between funding for procurement of capital assets and funding for the maintenance and repair thereof is of minor importance for our purposes.*

### 3.4 Finance Methods and Social Cost

There are three ways to finance the use of capital assets. The first is debt, where the principal to make the capital purchase is borrowed and interest is paid periodically on the principal. The second is equity, which accrues when capital is purchased outright or when debt is retired. Long-term lease arrangements are included in these first two categories, which are debt initially and become equity once ownership is fully transferred. The third is through short-term leases, where ownership is never taken by the district.

What is the cost per dollar of each method of finance, applied to the same type of asset? Let us first note that raising public funds for capital will incur the excess burden of taxation no matter what method of finance is chosen. That is, raising one dollar of public revenue will cost more than one dollar due to the distortionary effect of taxation on choices and because of administrative costs. Since this cost applies to all funds raised for schools, let us set it aside for the purpose at hand.

Let us consider leasing and debt before taking up equity. For debt financed capital, the costs incurred are interest on the debt as well as maintenance and depreciation costs. If the district is a good steward of public resources, it will deploy maintenance to minimize the combined costs of depreciation and maintenance. Let $m$ denote the maintenance cost per dollar of capital that minimizes maintenance and depreciation per dollar of capital. Similarly let $d$ denote the resulting depreciation per dollar of capital. Then $m+d$ is the optimized cost of depreciation and maintenance per dollar of debt financed capital. If we let $i_D$ represent the interest rate at which the district can borrow, the cost of a dollar of debt financed capital is $i_D+m+d$. If we let $K_D$ represent the amount of debt financed capital, then the annual cost of debt financed capital is $(i_D+m+d)K_D$.

Assuming demand for the district's bonds slopes down, even if only slightly, the interest rate faced by the school district will be higher the more it borrows. It is also possible not all forms

of capital are equally suited to short-term lease arrangements, so that the price of leasing per dollar of capital leased, $p_L$, will be increasing with the amount leased. Under these conditions, if the district is a good steward of public funds, it would lease more when the cost of a dollar of debt financed capital, $i_D+m+d$, is more than the cost of leasing per dollar of capital, $p_L$, and vice versa. Thus, if the district finances capital at minimum cost, the costs per dollar at the margin will equal one another to a reasonable approximation, $p_L=i_D+m+d$. If we let $K_L$ represent the amount of capital financed by short-term lease, then the annual cost of debt financed capital is approximately $(i_D+m+d)K_L$.

Aside from optimization on the part of the district, arbitrage on the other side of capital markets causes the full cost of securing capital services through short-term leases and debt financing to be similar. If those investing in leasing companies earn a higher return than those lending to schools, more will use their funds investing in leasing companies, and vice versa. Again, this implies the cost per dollar of capital will be approximately $i_D+m+d$ whether procured by short-term lease or through debt.

It is worth emphasizing that $i_D+m+d$ is just a reasonable approximation of leasing costs per dollar. Moreover, it is likely a lower bound, due to frictions in the real world. For example, it is possible that leasing may occur predominately when there is not time to issue debt, for example for needs that arise on short notice, and that given the choice the district would issue debt instead. It is also likely, as we will see in a later section, that a disproportionate share of leasing is done by charter schools, which will face a higher cost of credit than the district as a whole.

Now let us consider equity finance. Funding for equity finance raised through taxation does not itself represent a social cost, other than the excess burden of taxation, which applies equally to all means of finance. Rather, resources are transferred from individual taxpayer accounts to a collective taxpayer account held by the school district on behalf of district residents. The social cost of raising equity is the foregone opportunity to use those funds it for other purposes each year. Individuals might use it, for example, to pay down their mortgage.

If we let $i_E$ represent the opportunity cost of funds to taxpayers, and let $K_E$ represent equity financed capital, the annualized cost of equity financed capital is $(i_E+m+d)K_E$. If possible, a district efficiently minimizing social costs would adjust the level of debt until $i_E$ and $i_D$ were approximately the same, otherwise costs would be lower utilizing more of whichever were cheaper and less of whichever were more expensive. And again, in a frictionless world, if $i_E$ were higher than $i_D$, the demand for school bonds would decline as funds were used elsewhere, driving their price down and the effective interest rate, $i_D$, up. Thus, again, arbitrage, not only efficient optimization by state and local officials, means that $i_D+m+d$ is a reasonable approximation of the cost per dollar of equity finances educational capital.

Individual taxpayers will generally not have access to credit terms as favorable as governments, if for no other reason than they cannot levy taxes to raise funds and service debt and are far more likely to go bankrupt. Thus, $i_E$ may exceed $i_D$, and the social cost of a dollar of equity financed capital may be slightly higher than the social cost of debt financed capital.[4]

[4] For discussion of issues related to precisely identifying the social discount rate to be used to evaluate government projects with impacts over time, see Chapter 10 in Boardman, A., Greenberg, D., Vining, A., and Weimer, D, 2018, *Cost-Benefit Analysis: Concepts and Practice*. 5th Edition, Cambridge University Press.

Thus, the cost of equity financed capita, $K_E$, debt financed capital, $K_D$, and leased capital, $K_L$, is well approximated by $(i_D+m+d)(K_E+K_D+K_L)$, or, letting $K=K_L+K_D+K_E$, $(i_D+m+d)K$. Further, the cost is likely relatively insensitive to the exact mix of methods used to finance its provision.

- *The cost per dollar of school capital, aside from the excess burden of taxation, is approximately the sum of the interest rate at which the district borrows and maintenance and depreciation per dollar of capital.*

There is a long history of work demonstrating that there may be little difference between methods of finance or that the differences may not be what they first appear to be. In 1820 David Ricardo argued that in a frictionless world with perfect markets it would not matter because taxpayers could simply save and borrow to offset the difference.[5] The work of Modigliani and Miller (1958) established that whether a corporation financed its capital through debt or equity would not matter at all with perfect markets, and so were consequential only in regard to the presence of various types of market imperfections.[6] The Consumer Price Index and the National Economic Accounts rely on an equivalence relationship between renting and owning housing.[7]

Thus, this is a general principle, not something that applies only to schools. If a producer rents capital, the value of rent paid is the price of obtaining capital services.[8] If a producer instead purchases the asset, using equity or debt, the price paid for its services is still the rent, albeit implicitly, because the opportunity cost of using the asset themselves is the foregone chance to rent the asset to another party. Rent, at least in this context, is simply a flow of payments over time in exchange for a flow of services received over time. Rent reflects the opportunity cost of tying up funding in the asset, maintenance costs, and depreciation costs. It reflects these costs whether paid explicitly according to the terms of a lease or implicitly on equity financed capital, or as a combination of interest payments on debt and maintenance and depreciation costs.

Though changes in the method of capital finance have only small effects on the social cost of capital at the margin given efficient and optimizing school districts, that does not mean the choice of finance methods is irrelevant generally. These matters are important to school districts, and anyone interested in the details of school finance, for many reasons. Different actors will be situated differently in relation to the benefits and costs of different finance methods. It therefore makes sense for some actors to own capital assets and others to rent them, or for a given actor to own some capital assets and rent others. Which finance method is most advantageous in any instance depends on the specific circumstances involved.

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[5] Buchanan, J. 1976. "Barro on the Ricardian Equivalence Theorem." *Journal of Political Economy*. 84(2): 337-342.
[6] Modigliani, F. and Miller, M. 1958. "The Cost of Capital, Corporation Finance and the Theory of Investment." *American Economic Review*. 48 (3): 261–297.
[7] On equivalence in the Consumer Price Index, see Ptacek, F. and Rippy, D. 2013. "Owners' Equivalent Rent and the Consumer Price Index: 30 Years and Counting." *Beyond the Numbers: Prices and Spending*. U.S. Bureau of Labor Statistics. Accessed May 24, 2022 at https://www.bls.gov/opub/btn/volume-2/pdf/owners-equivalent-rent-and-the-consumer-price-index-30-years-and-counting.pdf. On equivalence in the National Income and Product Acounts, see Nicole Mayerhauser, N. and Reinsdorf, M. 2007. *Housing Services in the National Economic Accounts*. Bureau of Economic Analysis. Accessed August 4, 2021 at https://www.bea.gov/sites/default/files/methodologies/RIPfactsheet.pdf.
[8] Long-term leases (financial leases), whereby the lessee assumes ownership of the asset at the end of the lease or may do so for a small cost, are generally like debt finance. The use of the term rent herein refers to short-term leases (operating leases) in which the lessor bears the long-term consequences of asset ownership. More discussion of leases may be found in Vernimmen, P, Quiry, P., Dallocchio, M., Le Fur, Y., and Salvi, A., 2017, *Corporate Finance: Theory and Practice*, 5th Edition, John Wiley & Sons Ltd.

Since school districts have access to reliable revenue streams and do not move or go out of business, loans to them are considered safe, so they can borrow at relatively low cost. They are also large enough to develop their own capacity to competently manage property. Thus, we observe that school districts tend to own a lot of buildings and provide many maintenance services in house. Similarly, though charter schools are public schools and part of the district in which they are located, they are more independent financially and can, and do, go out of business, so they will face higher credit costs. They are also smaller and less able to maintain the equipment, manpower, and expertise to manage property in house. Therefore, they may optimally rent much of the space they need and rely more on external property management services.

Districts can and should make the most of the resources available to them through wise capital budgeting practices, that is by carefully choosing the best mix of these methods of finance depending on the nature of the specific capital item in question and their individual situation.[9] But if all districts do this equally well, the impact of differences in finance mechanisms across districts in and of itself will have minimal impact on the relative level of capital services available to students across districts. If some districts consistently make these decisions poorly, the solution is to hire a better Chief Financial Officer, not to extract additional capital funding from taxpayers.

### 3.5 Finance Methods and Adequate Capital Funding

In the previous section we argued the social cost of capital funding was largely insensitive to variations in the mix of finance methods, short-term lease, debt, or equity. The social cost of capital, however, is not the quantity of most interest here. Rather, we are considering annual capital funding. The two differ because the annualized social cost of the use of equity is not paid explicitly by the school district. Rather it is borne implicitly through the loss of the use of those funds by taxpayers for other purposes. While $i_D+m+d$ is a good approximation of both the annualized social cost and annual funding required for capital procured through debt or short-term lease, annual funding to support equity financed capital is different.

How much funding is required annually to support equity financed capital? To support capital that has already been purchased, $K_E$, only enough funding for maintenance and to replace capital that wears out, $(m+d)K_E$, is required. However, if that is all the funding provided to support equity financed capital, as the total capital stock grows due to enrollment growth or due to increases in the desired level of capital per student, eventually the share of equity in total capital will go to zero, and essentially all capital would be financed by debt or through short-term lease. The actual behavior of districts suggests that would likely not be optimal.

Let $f_E$ represent the ratio of equity to total capital if the district optimizes its performance as Floridians would desire. Let us suppose this ratio is at least zero and at most one, that is that neither negative equity nor excess capacity are desirable, and that the desired equity ratio does not change appreciably with growth from one year to the next. Finally let $g_K$ represent the desired growth rate of capital, reflecting enrollment growth and growth of desired capital per student due,

[9] Whether to rent, purchase from equity, or purchase by issuing debt is a capital budgeting question. In this context, the best choice is the option that minimizes the expected net present value of the cost of the flow of capital services obtained, considering all implicit and explicit costs. The principles involved are discussed in Boardman, A., Greenberg, D., Vining, A., and Weimer, D., 2018, *Cost-Benefit Analysis: Concepts and Practice,* 5th Edition, Cambridge University Press. More detailed discussion of related financial issues may be found in most any Corporate Finance textbook, for example Vernimmen, P, Quiry, P., Dallocchio, M., Le Fur, Y., and Salvi, A., 2017, *Corporate Finance: Theory and Practice*, 5th Edition, John Wiley & Sons Ltd.

for example, to growth in real income per capita. The annual funding needed to purchase capital or retire bonds to increase equity sufficiently to maintain $f_E$ is $g_K f_E K$, so annual funding required to sustain equity financed capital is $(g_K+m+d)f_E K$.

Let us now make two assumptions about legislative intent and the meaning of adequate funding. First, the legislature intends capital funding to come from capital sources, not operating funding. Second, adequate annual funding must be regular and predictable to sustain responsible and adequate planning and budgeting over time. Let $r_R$ denote regular recurring annual revenue for capital spending and let $k_A$ denote the minimum adequate level of capital per student.

Combining the foregoing assumptions, definitions, and conclusions yields the following inequality for adequate annual capital funding: $r_R \geq [i_D(1-f_E)+g_K f_E+m+d\ ]k_A$. Expressed in plain English, this is as follows.

- *Adequate capital funding per student must meet or exceed the product of the minimum adequate capital stock and the sum of 1) the interest rate on debt multiplied by the fraction of capital not equity financed, 2) the desired growth rate of capital multiplied by the fraction of capital that is equity financed, 3) optimized maintenance expenditures per dollar of capital, and 4) the depreciation rate given optimized maintenance.*

If this condition does not hold, capital funding is inadequate to sustain capital services at state standards. If a large enough stock of capital was inherited from earlier periods, the inequality may be violated while capital services remain adequate temporarily, by drawing down the stock of capital that was initially more than adequate, but that cannot be sustained for long. If recurring revenues per student are not trending up sufficiently, capital services will eventually become inadequate. If the inequality does not hold and if recurring revenues were not previously significantly higher than this level, to have built up a more than adequate level of capital, capital will be inadequate. If there is a significant backlog of routine maintenance and repair (i.e., deferred maintenance), so that current capital is below standard, and this condition does not hold, capital services are inadequate.

Two difficulties arise in operationalizing this inequality. First is our inability to define adequate capital per student, $k_A$ in a general way. However, we can identify the state's estimate of the cost of constructing a student station meeting state established standards and use it to estimate the annualized cost of the corresponding level of capital. Let $k_S$ represent this level of capital per student. Adequate capital per student is at least this large. That is, funding to meet minimum standards may not be adequate, but adequate funding must allow schools to meet the minimum standards set by the state. Thus, we can replace the unmeasurable $k_A$ with the measurable $k_S$ in the inequality above and it will continue to hold.

Second, while it is not beyond the realm of possibility that we might construct a reasonable measure of the fraction of capital that is equity financed, the data to do so is not readily available. Moreover, how do we know just how many units of "physical capital" are left in a 25-year-old school building that cost $1 million when new? Even if we had the full history of maintenance and repair and remodeling expenditures for every capital asset in the state, at best we could make a rough estimate. Practically the best we can do is to make calculations based on what seem like reasonable scenarios.

However, since the fraction that is equity financed is at least 0 and at most 1, we know that $i_D(1\text{-}f_E)+g_K f_E$ is strictly greater than the minimum of $g_K$ and $i_D$ if the two differ. Thus, we can rewrite the inequality above establishing a (more) conservative lower bound: $r_R \geq [\min(i_D,g_K)+m+d\,]k_A$. In plain English, this is as follows.

- *Adequate capital funding per student must meet or exceed the product of the per student cost of the capital required to meet minimum state standards and the sum of 1) the minimum of the interest rate on debt and the growth rate of adequate capital, 2) optimized maintenance expenditures per dollar of capital, and 3) the depreciation rate given optimized maintenance.*

It is nearly certain that this lower bound represents an overly conservative estimate of adequate funding. First, the minimum capital standard may be less than what most consider adequate. Second, as we will see below, in practice the interest rate on debt is larger than the growth rate of adequate capital, with the difference largely reflecting inflation. The reason for this is that the interest cost on capital held as equity is paid implicitly by taxpayers, not explicitly in annual funding. Since capital held as equity appreciates with inflation, funding to expand capital equity need only account for real growth in capital cost, not inflation. Even so, the lower bound is useful because it is straightforward to estimate and establishes a clear lower bound.

In later sections we will use these inequalities to determine whether current capital funding is sufficient to sustain minimum capital standards. Before taking that up, the next section derives the inequalities with more precision and formality in a dynamic capital budgeting framework. The next section may be viewed largely as a technical appendix to this section, and so skipped by readers who are not interested in such detail. It does, however, provide a more explicit framework with which to understand the financial data presented later.

# 4. Adequacy in an Optimal Capital Budgeting Framework

Capital budgeting is complex because capital assets are expensive and durable and therefore financed over time. With a large enough stock of capital, capital services may remain adequate for some time without any spending on capital outlay, but that cannot last forever. Over time, the stream of reliable funding must be large enough to sustain adequate levels of capital service. To frame the discussion of capital adequacy with precision, we need a framework that incorporates the way the stock of capital at any given time, and therefore the flow of capital services available at that time, depends on the flow of capital funding up to that time, and the way what happens at that time effects the level of capital services available in the future.

In the previous section, we argued that the rule for sustainably adequate capital funding boiled down to a relatively simple inequality. In this section we derive that inequality in an explicit capital budgeting framework. In addition to establishing the validity of the rule we already explained, this allows us to be explicit about the relationship between the evolution of the capital stock and the time series data available for related revenues and outlays in Florida.

This is a somewhat tedious task, and moreover we rarely make explicit reference to material from this section in later sections. Readers who are at ease with the explanation presented in the previous section and not interested in details of the relationship between these ideas and the data we will rely on later may skim or skip this section without loss of continuity. Readers who are more interested in such mathematical detail may find going through this section helps them frame what follows more precisely.

### 4.1 Definitions and Notation

Due to the number of variables to keep track of, we need concise notation. Thus we start by listing and defining each variable and briefly discussing what it represents if it is not self-explanatory. Some but not all of these variables were defined and discussed in the previous section.

$K$: Total capital assets available for use in education, or the size of the stock of capital from which educational services are derived. In some contexts, we might think of $K$ as the fair market value of all assets used in education production. In other circumstances we might think of it as the replacement cost of those assets.

$K_L$: Capital assets secured by short-term lease. Expenses related to such leases may be supported out of operating funding, for example buildings leased by charter schools. However, such leases still procure annual services of capital assets.

$K_D$: Debt, for example bonds or long-term capital leases.

$K_E$: Equity, capital assets available for use in education less debt and assets secured by short-term lease, $K_E = K - K_L - K_D$.

$I$: Investment in equity and debt financed capital (capital outlay).

$M$: Expenditures on routine maintenance and repair of capital assets, including insurance.

$f_L$: Fraction of capital financed by short-term lease, $K_L/K$.

$f_D$: Fraction of capital financed by debt, $K_D/K$.

$f_E$: Fraction of capital financed by equity, $K_E/K$, $f_E = 1 - f_L - f_D$.

$m$: The cost of routine maintenance and repair of capital assets as a percentage of the value of the capital stock when the combined costs of depreciation and maintenance are minimized.

We assume this percentage is invariant to capital ownership. Maintenance costs on owned or debt financed capital assets are $m(K_E+K_D)$ when optimized.

$d$: Depreciation given optimized maintenance as a percentage of the capital stock. Measured as the expenditure per dollar of capital needed to keep the level of educational services supported by the capital stock from declining over a given year. If structures were the only capital, they had a lifespan of 50 years with optimal maintenance, they provided equal service over their useful life, and their age was uniformly distributed from 0 to 50, the depreciation rate, so measured, would be 2%, as $1/50^{th}$ of the capital stock would require replacement each year to maintain the level of service. Depreciation depends on spending on maintenance and repair, which keeps capital from wearing out in a shorter time than its normal service life. Depreciation costs to a lessor are passed along to the lessee in the cost of the lease.

$R$: Total annual funding.

$R_O$: Revenue intended for non-capital expenditures. It is worth noting that capital services obtained through short-term lease may be funded through this revenue—this is common practice for charter schools.

$R_R$: Regularly recurring state and local revenue for capital purposes. Revenue arising from established and long-standing tax bases intended for capital outlay, maintenance, repair, debt service, etc. These include local revenues at the discretion of the school board, state revenues predictably disbursed according to long standing rules and procedures, and discretionary revenue from the legislature that recurs predictably.

$R_I$: Irregular local and state revenues intended for capital outlay, maintenance, repair, etc. Includes local revenues raised from established tax bases but not at school board discretion. Includes state revenues not clearly related to any long-standing allocation rules or processes. Also includes federal revenue intended to support capital outlay, which is not at the discretion of the legislature or the school board and is often intended for narrowly specified purposes, and so cannot be counted on to fund broad ongoing capital needs.

$X$: Total annual expenditures.

$X_O$: Non-capital related expenditures, e.g. salaries for instructional staff, not including short-term leases for capital services.

$X_K$: Capital related expenditures; capital outlay, debt service, leasing, and maintenance.

$B$: Beginning of period balance of funds carried forward from previous period.

$B_K$: Beginning of period balance to optimally facilitate capital expenditures.

$B_O$: Beginning of period balance to optimally facilitate non-capital expenditures.

$i_B$: Interest on balance carried forward from the previous period.

$i_D$: Interest rate on debt.

$p_L$: Lease payments per unit of leased capital. Assuming school districts face a downward sloping demand for debt and optimize, or that investors freely move funding from leasing to buying debt according to where the return is highest, $p_L=i_D+m+d$.

$g_K$: Desired capital growth rate.

$g_B$: Optimal balance of funds growth rate.

$S$: Student enrollment.

$r_R$: Regularly recurring capital revenue per student, $R_R/S$.

$k$: Capital per student, $K/S$.

$k_A$: Minimum level of capital per student that yields an adequate level of service.

$k_S$: Capital per student sufficient to meet standards established by the state, $k_S \leq k_A$.

### 4.2 Budget Balance

Using the definitions and notation above, letting $\Delta$ represent change over one period, and noting that the change in the account balance is the difference between incoming funding and expenditures, yields the following expression for the change in the account balance.

$$\Delta B = \{ i_B B + R_R + R_I + R_O + \Delta K_D \} - \{ X_O + M + I + p_L K_L + i_D K_D \} \quad (1)$$

The change in the account balance may be negative if the balance is drawn down.

We can derive the following expression by rearranging equation 1.

$$I + i_D K_D + p_L K_L + M = (R_R + R_I) + (\Delta K_D - \Delta B) + i_B B + (R_O - X_O) \quad (2)$$

The left-hand side of equation 2 is the sum of spending on the things for which capital funding is intended: capital outlay, debt service, leased capital, and maintenance and repair. The right side represents funding spent for those purposes, arranged in four groups. The first group consists of major sources of revenue, divided into what we have termed regular and irregular revenue. The second group includes the other major sources of capital funding, net increases in debt and net decreases in account balances (carry forward). Account balances may be accumulated over time for the purpose of eventually expending them rapidly on a capital project.

The remaining funding sources in equation 2 must be of minor consequence on average and in most years. Interest on account balances is small because interest rates on highly liquid assets are low. Operating revenue is intended to be spent on non-capital items but may be spent on short-term leases of capital services. Though the difference between operating revenues and non-capital costs and leases may be slightly positive or negative in any given year, leading to corresponding changes in account balances, the difference will typically be small assuming the legislature does not intend schools to finance long-term capital needs with operating funds.

### 4.3 A Lower Bound for Adequate Capital Funding

We can use this budget framework to establish a lower bound for adequate capital funding. To do so, first note that the lowest possible level of funding that could achieve any given set of outcomes, thus the lowest adequate funding level, occurs when school districts optimize their decisions given available revenues and the constraints they face. Thus, from here forward, we assume relevant decisions have been optimized. This is a useful simplifying analytical device given that we are focusing on determining the minimum level of adequate capital funding, not whether actual capital resources are adequate at a specific point in time.

We assume that at the optimum, the ratios of equity, debt, and short-term leased capital to total capital ($f_E$, $f_D$, and $f_L$) all lie between 0 and 1 and together sum to 1. This means it is not optimal for the district to be a net lender or net lessor, to maintain excess capacity, or to sustain a negative equity position, and that there are no other means of capital finance. It is not necessary that all are strictly above 0 or less than 1, though standard assumptions like a downward sloping demand for the district's bonds and heterogeneity of lease administrative costs across types of capital would yield interior solutions. We also assume that any changes in the optimal values of

these ratios from one year to the next are negligible, or, equivalently, that conditions do not change radically or discontinuously from one year to the next.

The change in equity is investment (new capital outlay) less the net change in debt and less depreciation of capital financed by debt or equity and may be expressed as follows.

$$\Delta K_E = I - \Delta K_D - d(K_E + K_D) \tag{3}$$

If investment is less than depreciation plus the change in debt, equity declines. Since $g_K$ is the desired rate of increase in capital funding, with optimal budgeting the change from one year to the next in equity financed capital must be $\Delta K_E = g_E f_E K$ to maintain $f_E$ and $K$ at their optimum. Thus, we can rewrite equation 3 as follows.

$$I = g_K f_E K + \Delta K_D + d(f_E + f_D)K \tag{4}$$

At the optimum, the sum of depreciation and maintenance expenditures must be minimized conditional on $K$, so $M = m(f_E + f_D)K$, or else a change could free up wasted funding. We make this substitution into equation 1 for $M$. Similarly we substitute $g_B(B_O + B_K)$ for $\Delta B$ in equation 1. We use equation 4 to substitute for $I$ in equation 1. Finally, we substitute $i_D + m + d$ for $p_L$ in equation 1. Equation 1 may then be rewritten as follows.

$$R_R + R_I - (g_B - i_B)B_K + (R_O - X_O - (g_B - i_B)B_O) = (i_D(1 - f_E) + g_K f_E + m + d)K \tag{5}$$

We now apply two assumptions we believe to be self-evidently reasonable. First, we assume the legislature intends to support capital procurement with capital funding and does not intend operating funding to indefinitely fund capital, and vice versa. Thus, $R_O = (g_B - i_B)B_O + X_O$ in an optimized budget with adequate funding. Second, we assume adequacy implies recuring annual revenues intended for capital purposes, $R_R$, must cover the minimum cost of providing adequate capital services. This is because school districts cannot count on, and efficiently plan for, meeting capital needs from funding sources that do not recur regularly according to established procedures, or which require actions or approvals beyond the control of the legislature or the school board. Applying these assumptions and substituting $Sk_A$ for $K$ (note $Sk_A \leq K$ if funding is adequate) in equation 5 yields the following.

$$R_R \geq [(g_B - i_B)B_K + i_D(1 - f_E) + g_E f_E + m + d]Sk_A \tag{6}$$

The desired growth rate of fund balances, $g_B$, which will reflects factors such as enrollment growth, inflation, and any impact of real income growth on education spending, is unlikely to be less than the interest rate on carry forward balances, $i_B$, since those balances must be kept highly liquid to fund purchases as needed, thus $(g_B - i_B)B \geq 0$. Further, $f_E$ must fall between 0 to 1, thus $i_D(1 - f_E) + g_E f_E$ must fall between $i_D$ and $g_E$. Noting that adequate capital must at least equal the minimum cost of meeting state established standards and dividing by enrollment, we may then rewrite inequality 6 as follows.

$$r_R \geq [\, i_D(1 - f_E) + g_E f_E + m + d\,]k_S \geq (\min(i_D, g_K) + m + d)k_S \tag{7}$$

Inequality 7 was discussed intuitively at the end of the previous section. Its interpretation is as follows. Regularly recurring capital funding per student ($r_R$) must cover the cost minimizing level of maintenance ($m$) and depreciation ($d$), and either pay the finance costs associated with debt and short-term leases ($i_D$) or else provide for immediate purchase of capital required for growth ($g_K$) or some combination of the two, as applied to the level of capital per student that meets minimum standards ($k_S$).

### 4.4 The Ratio of New Debt to Annual Capital Spending

It will prove useful to characterize the ratio of annual new debt to annual capital spending in an optimized budget. Holding the finance mix constant at its optimum, new debt, $\Delta D$ is $g_K f_D K$ and capital spending, $X_K$, the sum of capital outlay, debt service, capital leasing costs, and maintenance expenditure, is $[(g_K+m+d)(f_E+f_D)+i_D f_D+f_L p_L]K$. Using $p_L = i_D+m+d$ and rearranging gives the following expression for the change in debt per dollar of capital spending.

$$\frac{\Delta D}{X_K} = \frac{g_K f_D}{g_K f_D + m + d + i_D - (i_D - g_K) f_E}. \tag{8}$$

The ratio of new debt to annual capital spending is increasing in $g_K$ and decreasing in $m$, $d$, and $i_D$. In section 7, we show that 0.04 to 0.07 is a reasonable range for $m+d$, 0.03 to 0.05 is a reasonable range for $i_D$, and 0.013 to 0.018 is a reasonable range for $g_K$.

The impacts of $f_D$ and $f_E$ are more subtle. Holding $f_E$ constant, it is increasing in $f_D$. Holding $f_D$ constant, it is increasing in $f_E$ as long as $i_D$ exceeds $g_K$, which is the case. The difference between $i_D$ and $g_K$ largely reflects inflation. The final term in the denominator of equation 8 arises because the nominal interest rate paid on debt reflects inflation, but the portion of the capital stock already owned rises in value with inflation. Since the value of equity capital is already growing at the rate of inflation, new equity financed purchases need only reflect growth in students and growth in desired capital per student (at current prices). Typically, when the optimal equity to capital ratio is larger the optimal debt to capital ratio will be smaller. Holding the ratio of short-term leases to capital constant, an increase in $f_D$ met by an equal decrease in $f_E$ will increase the new debt to capital spending ratio. Thus, holding $f_L$ constant, the ratio increases in $f_D$ but decreases in $f_E$ due to the associated decline in $f_D$.

Putting all of this together, the smallest ratio of new debt to annual capital spending occurs when the optimal debt share is 0, when the ratio must also be 0. The largest occurs when the optimal debt share is 1, $g_K$ is at its highest, and $m$, $d$, and $i_D$ are at their lowest. Thus, the highest reasonable ratio is 0.018/(0.018+0.04+0.03), or 0.205. Of course, it is unlikely optimal for all capital to be debt financed. If instead we assume half of capital assets are perpetually debt financed and the other half equity financed and continue to make extreme assumptions about the other parameters, the ratio is 12.3%. If rather than assuming extreme values for all the parameters, we instead assume $f_L$=0.1, $f_E$=0.6, $f_D$=0.3, $m+d$=0.05, $i_D$=0.04, and $g_K$=0.016, equation 8 tells us new debt must be 6% of annual capital expenditures. Experimentation with reasonable parameter values shows that if the district carries less debt than equity, new debt is unlikely to exceed 10% of annual capital expenditures.

# 5. Capital Funding Benchmarks

The level of education funding that is adequate to the needs of Floridians depends on our values—how important education is to us and how much are we willing to sacrifice to make things better for our youth. Since it is ultimately a value judgement, rather than something deduced logically or estimated empirically, it is not possible to quantify what adequate means in general terms. In the previous section we considered the possibility of establishing a lower bound for adequate capital funding by comparing it to minimum state standards.

Yet, as Heraclitus is commonly paraphrased, the only constant is change. If capital funding was adequate at some point in time but did not increase with the factors that drive increases in the desired level of capital, it would soon become inadequate. In this section, we establish benchmarks against which to measure changes in capital funding. To the extent capital funding declines relative to these benchmarks, it may reasonably be said to have become less adequate relative to the past, though it may be adequate or inadequate in absolute terms.

What are relevant drivers of capital spending desired by Floridians? Or, as economists would frame the question, what factors likely drive Floridians' demand for capital per student? Though perhaps not an exhaustive list, the most basic theory of demand, as taught in every *Principles of Economics* class, tells us that conditional on the importance of education to Floridians, desired spending on capital services per student depends on the size of the population (the number of buyers), the relative price of capital, and real income per capita. To these we might reasonably add the number of students per capita, since this impacts both the benefits of education spending and the effective price of capital per student as seen by the average taxpayer. We might also reasonably consider whether real national average education spending per student has risen faster or slower than real income per capita, if we want Florida's youth to be prepared partly in relation to the preparedness of their competition in the future labor market. We will discuss each of these in turn, starting with the simplest reasonable take and going into more detail thereafter.

### 5.1 Drivers of Desired Capital Funding—Simple Benchmark

Let us first consider the impacts of changes in the overall price level, total population, and real income per capita, holding all other factors constant. Assuming nothing else changes, changes in the price level should leave demand for capital per student unchanged. However, total desired spending on capital, the product of the price of capital, the number of students, and desired capital per student, will increase proportionally with the price level, because the price of capital rises in proportion to the overall price level leaving the relative price of capital unchanged.

Next let us consider the impact of changes in population, again assuming nothing else, including the ratio of enrollment to population, changes. Demand for capital per student will remain unchanged but desired total spending on capital will increase in proportion to the growth in population. If there are twice as many students, and twice as many taxpayers, and nothing else changes, we would not expect spending per student to change, so total spending must double.

That desired spending on capital should rise proportionately with both total population and the overall price level, holding all else constant, including students per capita and the relative price of capital, would seem almost self-evident. However, it is worth emphasizing for clarity.

- *Desired capital per student does not change with the price level or total population, so desired capital funding rises proportionately with the price level and population.*

Now let us consider the impact of increases in real income. As a simple first approximation, we might expect capital per student to increase proportionally with permanent increases in real income per capita, all else constant, meaning that over long stretches of time, capital spending would move about one for one with income. This will likely not hold over shorter intervals as incomes fluctuate with recession and recovery and education spending is smoothed by government fiscal policy. Technically, this is an assumption that the (permanent) income elasticity of demand for capital per student, that is the ratio of the percentage change in the desired level of capital per student to the percentage change in (permanent) real income per capita, equals 1.

We will dive into the relationship between the demand for capital per student and real income per capita in more detail below, for those that are interested. For now, let us briefly note three arguments supporting this as a simple but useful approximation.

First, when income increases by any given percentage, total spending must increase by the same percentage, assuming we have defined the basket of things upon which income is spent exhaustively (i.e., saving for retirement or bequests to children or charity are among the things income is spent on). Thus, for the average item purchased, the income elasticity of demand must equal 1. Why should capital per student behave differently than the average item purchased? One is the default, assuming it is anything else is what takes justification.

Second, we are not insisting the income elasticity of demand is exactly one, especially over short time intervals. We are not trying to make highly precise calculations at this point. Rather, we are simply saying that, as a benchmark, we expect desired capital to increase around 10% if real incomes permanently increase 10%.

Third, empirical studies suggest the elasticity of education spending with respect to permanent changes in income per capita is near 1, though perhaps slightly lower. They also find spending is much less responsive to short-term fluctuations around the permanent income trend, which makes sense given fiscal smoothing. We discuss these studies in more detail below. Of most importance for now is this intuition: if Floridians had 10% more spending power, permanently, they would like to increase spending on capital services for education by about 10%.

- *Desired capital increases roughly proportionately with permanent increases in real income per capita.*

Since (total) nominal income (hereinafter simply income) is the product of population, real income per capita, and the price level, it follows that holding constant the relative price of capital and students per capita (and any other demand drivers), capital spending must grow at the same rate as nominal income to maintain the same adequacy relative to the past. Thus, nominal income is, by itself, a simple and reasonable benchmark for the long-run trajectory of capital funding. If the growth rate of capital funding falls significantly short of the growth rate of nominal income for a protracted length of time, it is unlikely capital resources can remain adequate.

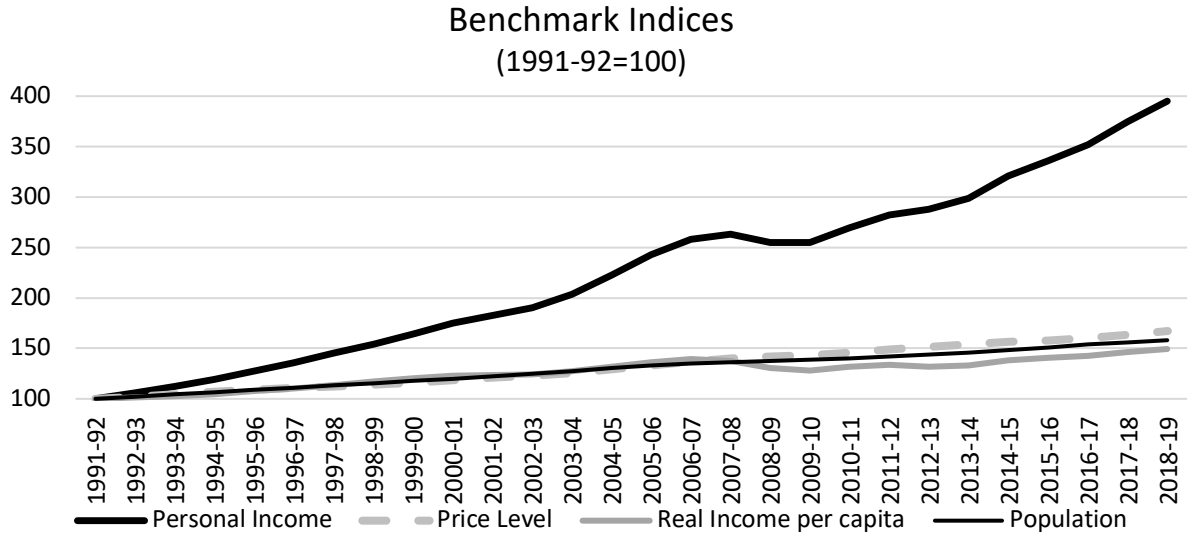
- *The long-run trend of nominal income—the product of real income per capita, population, and the price level—is a simple and useful capital funding benchmark.*

Capital funding from any given source is the product of the (average) tax rate and the tax base. If the tax base grows more slowly than income, the tax rate must increase to maintain revenue. However, the excess burden of a tax increases disproportionately with the tax rate. As illustrated in most introductory economics textbooks, it increases (at least approximately) with the square of the tax rate. At high enough tax rates, tax revenue would fall with further increases. This relationship between tax rates and tax revenues has come to be known as the Laffer curve. However, it is a straightforward implication in basic economic analysis and was known long before it was so named.[10] Thus, revenue cannot be sustained indefinitely by increases in tax rates. As a result, a given tax base erodes and becomes increasingly inadequate if it does not increase approximately in proportion to nominal income.

- *If a tax base upon which capital funding depends grows more slowly than nominal income, its ability to sustain tax revenue erodes, and thus capital funding will eventually become inadequate.*

Figure 1 presents indices of the price level, real income per capita, population, and nominal income (the product of the three) expressed as indices equal to 100 in the 1991-92 academic year. The price level is based on national data, while income and population are specific to Florida. Over

*Figure 1*




1) The series for any academic year is the geometric mean of the two corresponding calendar years.
2) The price level is the GDP Deflator from the US Bureau of Economic Analysis, Table 1.1.4. Price Indexes for Gross Domestic Product, at www.bea.gov.
3) Florida income and population are from the US Bureau of Economic Analysis, Table SAINC1 Personal Income Summary: Personal Income, Population, Per Capita Personal Income, at www.bea.gov. Real Income per capita is personal income per capita deflated by the GDP deflator.

[10] Arthur Laffer. 2004. *The Laffer Curve: Past, Present, and Future*. The Heritage Foundation. Accessed August 8, 2021 at https://www.heritage.org/taxes/report/the-laffer-curve-past-present-and-future.

the past three decades total income nearly quadrupled, growing at an average annual compound rate of 5.22%, with population, real income per capita, and the price level all contributing significantly to that growth.

### 5.2 Additional Drivers of Capital Demand

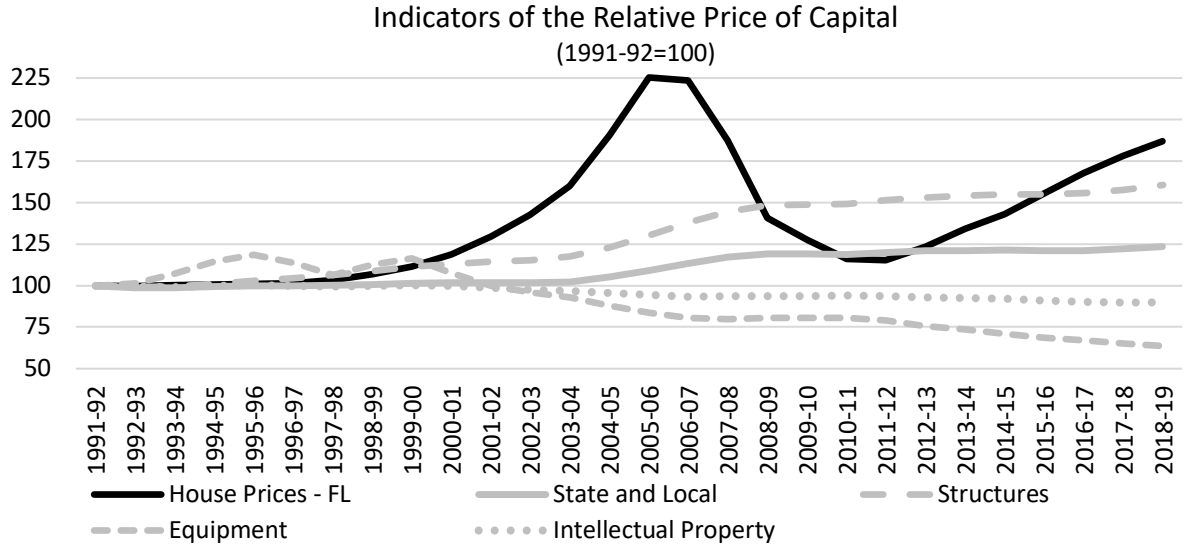
The relative price of capital per student depends on the relative price (relative to the overall price level) of a standard unit of capital and on the number of students per Floridian, since it is more costly to any given taxpayer to provide more capital per student when there are more students per taxpayer. It seems safe to assume that as the (relative) price of capital per student increases, the level of desired capital per student falls. That is, demand for capital per student slopes down.

Expenditures on capital might either rise or fall when the price of capital per student increases, depending on just how responsive demand per student is to the changes in price. If a given percentage increase in the relative price of capital per student reduces the desired level of capital per student by the same percentage (price elasticity of demand is -1), the two offset, and desired total expenditures remain the same.

- *Increases in the relative price of capital decrease the desired level of capital per student but may either increase or decrease the corresponding level of capital spending, depending on the responsiveness of demand for capital per student to price changes.*

Figure 2 presents various measures related to the cost of capital, measured relative to the overall rate of inflation, from the 1991-92 academic year through 2018-19. The first of these is a

*Figure 2*




1) The series for any academic year is the geometric mean of the two corresponding calendar years.
2) Repeat sales house price index from the Federal Housing finance Agency at FHFA.gov.
3) Price indices for state and local fixed investment, and its three component indices, structures, equipment, and intellectual property, are from the US Bureau of Economic Analysis, Table 5.9.4. Price Indexes for Government Fixed Investment by Type, at bea.gov. All series are deflated using the GDP deflator from Table 1.1.4. Price Indexes for Gross Domestic Product.

repeat sales house price index for Florida. Since school buildings are a large component of school capital costs, this is a useful Florida specific indicator of the change in capital funding needed to adjust for cost changes. Real house prices increased 86.9%, an average annual compound rate of about 2.3%.

School buildings do not account for all capital expenses. Figure 2 also presents price indices for state and local government fixed assets in the US and its three components from the US Bureau of Economic Analysis, relative to the overall price level. We see an overall relative increase of 23.5%, an average annual compound rate of 0.8%, driven by increases in structure prices that outweigh decreases in prices for equipment and intellectual property.

Given the increase in housing prices, the increase in structure costs is not surprising. The national increase in structure costs likely does not exactly match the increase in Florida, though it is probably a good indicator. We have all seen the declining cost of electronics of a given quality, which is but one example of the decline in equipment costs. Since equipment is transportable, the law of one price suggests the decline in equipment prices in Florida should closely correspond to what is seen nationally. While the mix of equipment, and the mix between equipment and structures, is likely somewhat different for Florida's schools than the US state and local government average, the overall change in capital prices is probably similar.

What impact would an average annual compound rate of 0.8% have on desired funding? None if the price elasticity of demand is exactly -1. If the price elasticity of demand is not -1, but is not extremely different, the change would be quite small. As we will see, most studies suggest the price elasticity of demand is less than 1 in absolute value, meaning demand is relatively inelastic, with −0.5 being a reasonable estimate. If the price elasticity of demand is −0.5, the change in desired capital per student is about -0.4%, resulting in a net increase in desired capital spending of 0.4%. This is swamped by the average annual increase in nominal income of 5.2%.

Increases in students per capita increase the effective price of capital per student, tending to reduce desired capital per student according to the sensitivity of demand to price. However, increases in students per capita increase the benefit of capital per student since there are more students for a given population, offsetting the price effect to some degree.

- *Increases in students per capita increase the effective price of capital per student, decreasing the amount demanded, and increase the benefit of capital per student, which may offset the impact of the increase in the effective price to some degree.*

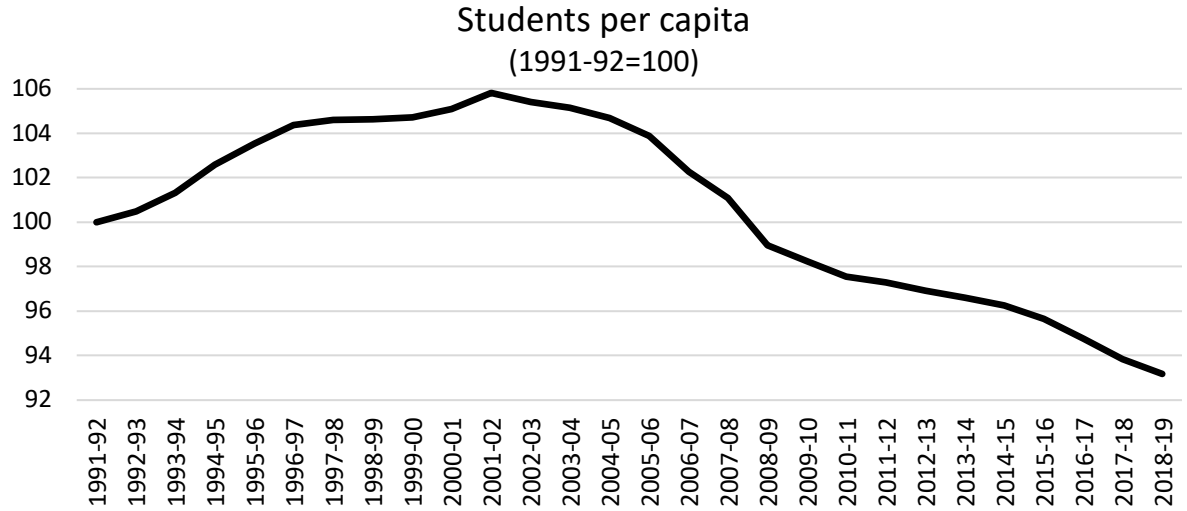
Figure 3 presents an index of students per capita in Florida. Students per capita fell 6.8% over the entire period, an average annual decrease of only 0.26%. However, this was the combined effect of an increase at the beginning of the period due to the baby boom echo, followed by sustained decline as the baby boom echo died out and more empty nesters and retirees moved to Florida. After its peak in 2001-02, the average annual rate of decline was 0.7%. This may partially offset any impact of the modest increases in relative capital prices on desired capital spending.

What is to be made of the combined effects of the factors shown in Figure 2 and Figure 3? The relative price of capital grew slowly over this time. However, for any reasonable value of the price elasticity of demand for capital, the resulting increase in desired spending is small. Moreover, it is likely offset in part by the small rate of decline in students per capita. The net impact of these

factors is dwarfed by the effect of changes in nominal income. Nominal income appears to be a very good benchmark for capital funding.

- *The combined impact of changes in the relative price of capital and students per capita has been small relative to the impact of nominal income over the past three decades. The trend of nominal income is a good benchmark for the trend of desired capital funding.*

*Figure 3*




1) Enrollment from the Institute for Education Statistics, National Center for Education Statistics, Common Core of Data, Elementary / Secondary Information System at nces.ed.gov/ccd/elsi/.
2) Population from the US Bureau of Economic Analysis at bea.gov.

The foregoing discussion provides a reasonably thorough consideration of factors that impact desired capital funding. The remainder of this section provides a more detailed, and technical perspective. Sub-section 5.4 provides a benchmark for capital funding based on the constant elasticity demand approximation commonly used in economics and published estimates of the elasticities of demand for education expenditures with respect to relative prices, real income per capita, and students per capita. We show that this approximation tracks aggregate U.S. education expenditures well over the past three decades, demonstrating its usefulness as a benchmark. However, we also show that the resulting benchmark closely tracks the nominal income benchmark established above, confirming the notion that nominal income is a simple and useful benchmark. Sub-section 5.5 presents a simple theoretical model of the demand for educational capital to clarify the remarks above regarding the effects of students per capita on demand for capital per student. Readers uninterested in such technical details can skip the remainder of this section with no loss of continuity.

### 5.4 A More Detailed Formulation of Capital Demand and Benchmarks

In this sub-section we derive a benchmark for capital funding that depends on real income, the relative price of capital, and students per capita. We then operationalize it using published estimates of demand elasticities. Let us start by defining variables and notation. Some of these were already defined in section 4 and some are new.

$k$: Units of standard capital per student. For example, the standard unit might be a fully equipped student station meeting all established standards and a pro-rata share of other necessary capital (e.g. school bus seats) in a reference year.

$k^*$: Desired units of standard capital per student, or demand for capital per student.

$P$: The price level, relative to a reference year in which $P$=1. Changes in $P$ reflect inflation.

$P_K$: The price of a standard unit of capital.

$p$: The relative price of capital, $P_K/P$.

$E_p$: The price elasticity of demand for capital per student; the ratio of the percentage change in demand per student to the percentage change in its relative price for small price changes.

$y$: Real income per capita.

$E_y$: The income elasticity of demand for capital.

$N$: Population.

$S$: Student enrollment.

$s$: Students per capita, $S/N$.

$E_s$: The elasticity of demand for capital with respect to $s$.

$y$: Real income per capita.

$Y$: Nominal income, $Y=NPy$.

$u$: The unobserved combined multiplicative effect of anything else that affects demand.

$X_k^*$: Current cost of the desired level of capital, $X_k^*=P_KSk^*$ or $X_k^*=PNspk^*$.

With these definitions we can express demand for capital per student, $k^*$, as follows,

$$k^* = ap^{E_p}y^{E_y}s^{E_s}u, \tag{9}$$

where $a$ is a constant chosen so that the (geometric) average value of the unobserved factors, $u$, is 1. Given how we have defined terms this is an identity, true merely by definition. To operationalize equation 9, we make the simplifying assumption that the elasticities are constant. In that case $u$ includes discrepancies introduced by that assumption.

If we take the logarithm of both sides, the resulting expression is linear in the logarithms of the variables, so the elasticities may be estimated using simple linear techniques. Therefore, this form of demand representation is widely used and has been employed by many studies of the determinants of public education spending, though not determination of capital spending specifically. We draw upon these studies for estimates of the elasticities in equation 9. Note that with estimates of demand elasticities and with the assumption that unobservable factors take their average value so that $u$=1, multiplying by the number of students and the price of capital to get desired capital expenditure yields the following.

$$X_k^* = aPNy^{Ey}p^{(1+E_p)}s^{(1+E_s)} \tag{10}$$

We have assumed the elasticity of per capita demand with respect to $N$ is 0, so that the elasticity of spending with respect to $N$ is 1. This merits discussion. If education was non-rivalrous in consumption, we would expect expenditures to rise less than proportionately with population, holding students per capita constant. Non-rivalry in consumption is one of the defining characteristics of pure public goods. An uncongested road is a good example. If traffic is light, one more car being on the road does not interfere with the ability of others to use the road.

We model capital as rivalrous in consumption for two reasons. First, only one student can use a given student station at a time. Of course, some aspects of education capital will exhibit economies of scale. For example, each school district only needs one office for its superintendent. But it seems self-evident that most capital inputs would need to roughly double if there were twice as many students. Second, considerable literature exists on the demand for public services. Reiter and Weichenrieder (1997) present a critical survey of this literature and conclude that there is little evidence of strong non-rivalry in consumption of typical state and local public services.[11]

Before turning to the empirical estimates of the elasticities in equation 9, let us consider two cases that may serve as points of reference. First suppose voters wish to spend a constant share of income on education and don't pay attention to anything else. If the number of students or prices go up 10%, all else equal there is simply 10% less capital per student. In that case $E_P$=−1, $E_s$=−1, and $E_Y$=1. Desired capital expenditure is $X_k^*=aPNy$ or $X_k^*=aY$. The constant $a$ reflects the share of income devoted to education and desired capital spending tracks nominal income.

Second, suppose voters insist on a particular level of capital per student regardless of prices or the number of students. In that case $E_P$=0 and $E_s$=0. The income elasticity will reflect whether the standard evolves over time as voters' living standards improve. Desired capital expenditure is $X_k^*=aPNspy^{E_y}$. If the standard for capital rises in proportion to voters' standard of living, this simplifies to $X_k^*=aspY$. Desired capital spending tracks nominal income but also adjusts proportionately with changes in students per capita and the relative price of capital.

Those two cases provide useful points of reference because they correspond to reasonable and simple narratives, but neither may reflect actual preferences. Reiter and Weichenrieder, whose survey included studies focused on education but also studies of other types of public spending, report the price elasticity of demand is almost always estimated to be smaller than 1 in absolute value, typically between -0.4 and -0.2. They also report that income elasticities are typically positive but less than 1. These findings are largely consistent with the literature review reported in Bergstrom, Rubinfeld and Shapiro.[12] Bergstrom, Rubinfeld and Shapiro also report previous estimates of the elasticity of students per capita that range from -0.73 to 0.21.

Two specific studies are of particular interest regarding the price elasticity. Bergstrom, Rubinfeld and Shapiro develop a procedure to estimate demand from individual survey data that avoids many pitfalls associated with other studies. They report results from several versions of their model, controlling for different covariates. The one most consistent with our purpose finds a price elasticity of -0.57 and an income elasticity of 0.83. Brasington and Haurin construct a model that considers not only the tax price but also that school quality can be capitalized into housing values.[13] Estimating two versions of their model, they find price elasticities of -0.56 and -0.53 and income elasticities of 0.46 and 0.57.

Next, we consider results from two papers that examine determinants of education spending across U.S. states in the long run. This is an important perspective because transitory variations in income are unlikely to have the same impact on desired education expenditures as

[11] Reiter, M., and Weichenrieder, A. 1997. "Are Public Goods Public? A Critical Survey of the Demand Estimates for Local Public Services." *Public Finance Analysis*. 54(3), 374-408.
[12] Bergstrom, T. C., D. L. Rubinfeld and P. Shapiro. 1982. "Micro-Based Estimates of Demand Functions for Local School Expenditures," *Econometrica* 50: 1183-205.
[13] Brasington, David M. and Haurin, Donald R., The Demand for Educational Quality: Combining a Median Voter and Hedonic House Price Model (April 15, 2006). Available at SSRN: https://ssrn.com/abstract=897323 or http://dx.doi.org/10.2139/ssrn.897323

are permanent changes in income. Therefore, studies that make no effort to focus on permanent income may underestimate income elasticities. Fernandez and Rogerson examine drivers of education expenditures across US states from 1950 through 1990.[14] Their results suggest the income elasticity of demand is near 1 and the elasticity of demand with respect to students per capita is near −1.

Poterba examines drivers of education expenditures across US states from 1961 through 1991 using models and data similar to those employed by Fernandez and Rogerson, but with some differences in how state specific effects and transitory income changes are dealt with.[15] When state fixed effects are included, the estimated income elasticities range from 0.53 to 0.78, but with relatively large standard errors. When fixed effects are not included, the estimates of income elasticities are near 1 with relatively small standard errors. The pattern is consistent with a permanent income elasticity near 1 and shorter run elasticities somewhat lower. The elasticity with respect to students per capita (measured here by the population share ages 5-17) is near −1 in the models with fixed effects while it is −0.4 in the models without fixed effects.

It seems reasonable to conclude demand for education is price inelastic, with the best estimates around −0.5 with some estimates somewhat smaller and a few much larger. The permanent income elasticity of demand is likely larger than 0.5 but not much larger than 1, with an estimate slightly less than 1 seeming most likely. Specifying a reasonable range and best estimate for the elasticity with respect to students per capita is more complex. On the one hand, it directly impacts the effective price of expenditure per student. If that were the only impact, it would equal the price elasticity. On the other hand, benefits might be higher when there are more students per capita, offsetting the price effect. Thus, this elasticity is likely to be negative but smaller in absolute value than the price elasticity of demand, $E_p \leq E_s \leq 0$.

Based on these values, we construct three benchmarks, a low estimate, a high estimate, and our best estimate. For the best estimate, we use 0.9 for the income elasticity and −0.5 for the price elasticity. We use −0.4 for the elasticity with respect to students per capita, since it should not be larger (in absolute value) than the price elasticity. Since real income has increased, we use 0.5 for income elasticity in the low estimate and 1.0 in the high estimate. Since relative prices have increased, we use −1 for the price elasticity in the low estimate and −0.2 in the high estimate. Since students per capita has fallen we use −0.2 for the elasticity with respect to students per capita in the low estimate (close to 0) and use −0.2 in the high estimate (cannot exceed the price elasticity in absolute value). These values and the resulting benchmark calculations are summarized in Table 1 below.

[14] Fernandez, R., & Rogerson, R. 2001. The Determinants of Public Education Expenditures: Longer-Run Evidence from the States. *Journal of Education Finance*, 27(1), 567-583.

[15] Poterba, J. 1997. Demographic structure and the political economy of public education. *Journal of Policy Analysis and Management*, 16(1), 48-66.

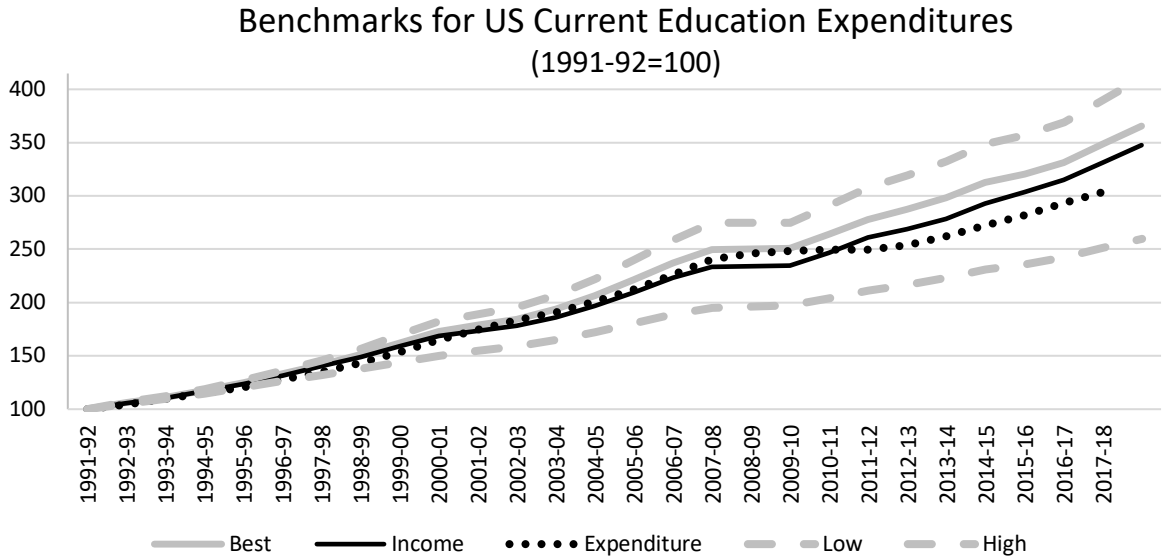
Table 1: Elasticity Estimates and Resulting Capital Spending Benchmarks

| | Low Spending | High Spending | Best Estimate |
|---|---|---|---|
| $E_y$ | 0.5 | 1 | 0.9 |
| $E_p$ | −1 | −0.2 | −0.5 |
| $E_s$ | −0.2 | −0.2 | −0.4 |
| Benchmark | $PNy^{0.5}s^{0.8}$ | $PNyp^{0.8}s^{0.8}$ | $PNy^{0.9}p^{0.5}s^{0.6}$ |

We present two figures to summarize the alternative benchmark indices and compare them to an index of actual educational expenditures. In both cases, we consider current, not capital, expenditures, thus the price index is for all state and local government consumption expenditures, not fixed assets.

Figure 4 presents the indices for the US. The benchmark using the best estimates of demand elasticities is close to the benchmark based on income alone, though the best benchmark implies somewhat higher growth in spending, due to the increase in relative prices. Both track education expenditures reasonably well. Though education expenditures were flat from 2008 through 2012, so expenditure fell behind the benchmarks, they have risen at a similar rate thereafter.

*Figure 4*



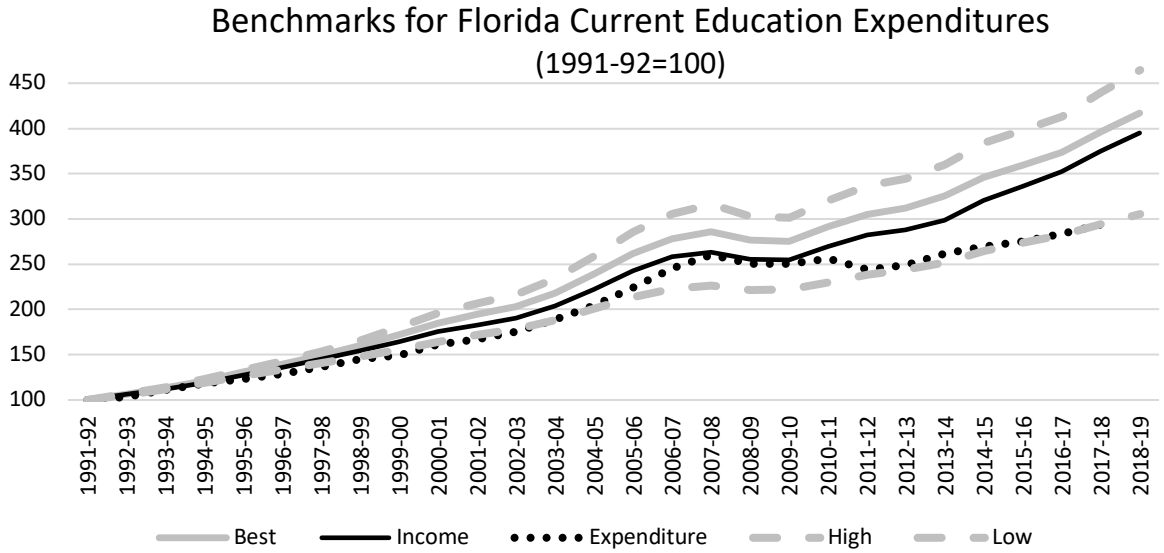

1) The overall price level, the price index for state and local consumption, income and population are from the US Bureau of Economic Analysis at bea.gov.
2) Enrollment is from the Common Core of Data, Elementary / Secondary Information System and current expenditures per pupil is from the Digest of Education Statistics, both from the National Center for Education Statistics at nces.ed.gov.

- *The benchmark based on our best estimates of the relevant elasticities of demand with respect to income, relative prices, and students per capita tracks US education expenditures closely.*

Figure 5 presents the indices for Florida. The indices for Florida differ from those for the US due to differences in real per capita income and students per capita. Once again, the benchmark based on the best elasticity estimates and the one based only on income track reasonably closely.

However, except for a period at the height of the housing boom, current expenditures in Florida have been considerably below the nominal income and best estimate benchmarks, instead tracking the low estimate.

*Figure 5*




1) The overall price level, the price index for state and local consumption, income and population are from the US Bureau of Economic Analysis at bea.gov.
2) Enrollment is from the Common Core of Data, Elementary / Secondary Information System and current expenditures per pupil is from the Digest of Education Statistics, both from the National Center for Education Statistics at nces.ed.gov.

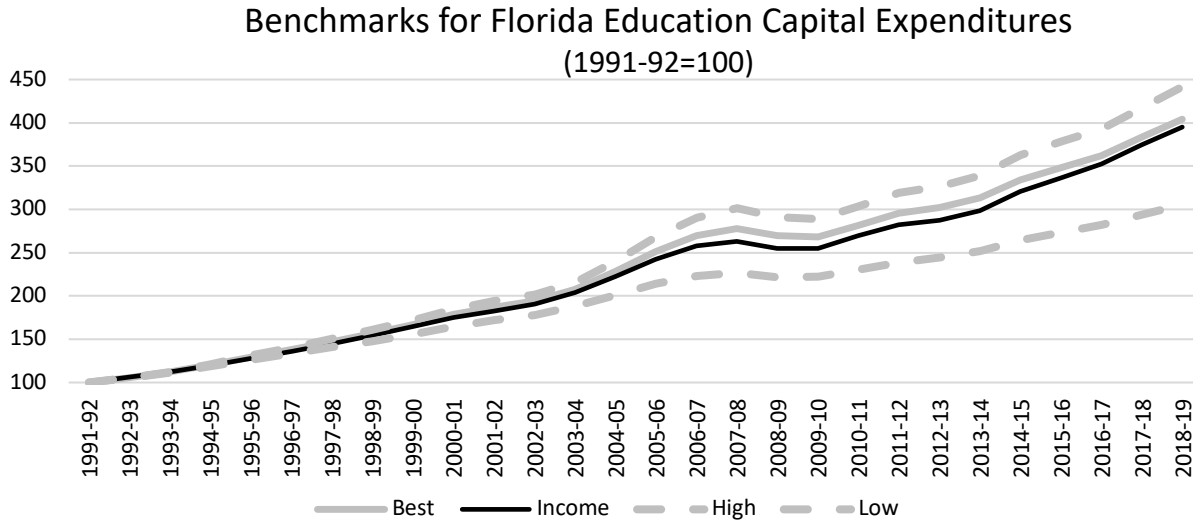
The low estimate was constructed by assuming that every elasticity was taken from the extreme end of the estimates in the literature that would result in the lowest spending. It is unlikely any of the elasticities are that extreme, and all but certain that all three are not. Thus, it is all but impossible to reasonably capture the low trajectory of education expenditures in Florida given measured trends in prices, incomes, and students per capita and existing estimates of voter preferences related to those variables. Education spending in Florida has been consistently less than one would expect based on published estimates of the demand for public education and trends in variables that drive that demand.

- *Education expenditures in Florida have lagged expectations based on income, relative prices, and students per capita given reasonable estimates of the elasticities of the demand for education.*

Figure 6 presents the benchmark indices for education capital spending in Florida. The only difference from the previous figure is that the relative price of state and local government fixed assets is used rather than the relative price of state and local government consumption. With that change, there is very little difference between the benchmark using the best estimates of elasticity and the simple nominal income index.

- *A benchmark for education capital funding in Florida based on nominal income growth closely approximates one based on the best estimates of the elasticities of the demand for education with respect to real income, relative capital prices, and students per capita and trends in those factors.*

*Figure 6*




1) The series for any academic year is the geometric mean of the two corresponding calendar years.
2) The price level (GDP Deflator) and the price index for state and local consumption are from the US Bureau of Economic Analysis at bea.gov.
3) Income and population are from the US Bureau of Economic Analysis, Table SAINC1 Personal Income Summary: Personal Income, Population, Per Capita Personal Income, at www.bea.gov.
4) Enrollment is from the Institute for Education Statistics, National Center for Education Statistics, Common Core of Data, Elementary / Secondary Information System at nces.ed.gov/ccd/elsi/.
5) Current expenditures per pupil are from the National Center for Education Statistics' Digest of Education Statistics at nces.ed.gov.

### 5.5. Capital Demand and Students per capita

The preceding discussion of the elasticity of capital demand with respect to students per capita and its relation to the price elasticity of demand was somewhat vague. In this subsection we present a model to clarify that discussion. Though it is a simple model, it is also abstract and technical. Readers unbothered by the vagueness in the previous discussion can skip to the next section without loss of continuity.

For simplicity, education is the only service provided by the government and capital is the only input in education. Capital is financed by a tax on income at rate $t$. Of course, Florida does not have an income tax—this is a simplification to focus on a few basic points. For our purposes, think of it as if $t$ corresponds to the ratio of state and local tax revenues to income. Balancing the district's budget requires $spNk=tNy$, or $t=spk/y$.

Individual $i$ cares about capital per student and their after tax income, $(1-t)y_i$. We use the Cobb-Douglas utility function $U_i=(A+Bs)\ln(k)+(1-A-Bs)\ln((1-t)y_i)$ to represent preferences. $A$ and $B$ are constants from the interval [0,1] such that $A+B<1$. Utility functions of this form are widely used to represent preferences in simple applied models. In this example, the

relative preference for own consumption versus supporting education varies with students per capita if $B>0$. Many benefits of education are more important when there are more students per capita. For example, when the average adult has more children, grandchildren, nieces, or nephews, they may care more about education relative to their own consumption. This is reflected by $B$.[16]

Substitution of $spk/y$ for the tax rate in the utility function allows it to be written as $U_i=(A+Bs)\ln(k)+(1-A-Bs)\ln(y-spk)+(1-A-Bs)\ln(y_i/y)$. Choosing $k$ to maximize utility yields the following demand for capital per student.

$$k^*=(A+Bs)y/ps \tag{11}$$

When $s$ increases, the numerator of equation 11 grows, reflecting higher benefits of education to the population at large. But so does the denominator, reflecting a higher cost of attaining any given level of capital per student.

The price elasticity of demand, $E_p$, is simply -1. The elasticity of demand with respect to students per capita is:

$$E_s = -A/(A+Bs). \tag{12}$$

$E_s$ falls between 0 and -1. When $B$ is near 0, students per capita does not matter to individuals, only the level of capital itself. In that case there is only a price effect, the elasticity equals the price elasticity of demand, -1, and nominal income, $Y$, is the right benchmark for desired capital spending. As $B$ becomes larger or $A$ smaller, the elasticity approaches 0 and the right benchmark is the product of students per capita, the relative price of capital, and nominal income, $spY$.

[16] Alternatively, if there are productivity spillovers from education, or if interactions with more educated individuals are more efficient or pleasant, individuals will care about the average level of education in the community, and this is more dependent on education when there are more students per capita. If we assume the geometric mean level of education matters and that education is proportional to capital per student, the resulting model is very similar, except the weight on the log of after-tax income is (1-$A$-$B$) rather than (1-$A$-$Bs$). The math is slightly messier, but the ultimate conclusions do not change.

# 6. Capital Funding

This portion of the report focuses primarily on four revenue sources which recur regularly and predictably. They are Capital Outlay and Debt Service Trust Fund (CO&DS) revenue, Public Education Capital Outlay and Debt Service Trust Fund (PECO) revenue, what we call the regular discretionary legislative allocation (RDLA), and discretionary local capital millage. These have historically been the basis of annually recurring capital funding used to meet the regular capital needs of Florida's schools. That is, districts have been able to count on them year after year.

There are other sources of revenue for capital funding, which we will refer to as irregular revenue. For now, it suffices to note that they are intended for specific and narrow purposes, apply under unique circumstances, require voter approval and are time limited, or are otherwise unreliable or outside the control of the district. Thus, unlike what we have called regular revenue, they cannot be counted on to sustainably fund the regularly recurring need for capital services.

Much of the discussion in this section is drawn from the Florida Department of Education's publication *Funding for Florida School Districts* and various years of the Florida Department of Revenue's publication *Florida Tax Handbook*.[17] Both are useful resources for those looking for more detail.

## 6.1 Public Education Capital Outlay and Debt Service Funding

According to *Funding for Florida School Districts*, districts, state colleges and universities, and other education agencies receive funds from the Public Education Capital Outlay and Debt Service trust fund (PECO). PECO funds may be used to construct new facilities or to perform maintenance, renovations, or repairs, and may be used either to back bond issues or distributed directly to districts. The fund consists of revenues derived from the collection of the gross receipts tax (GRT).

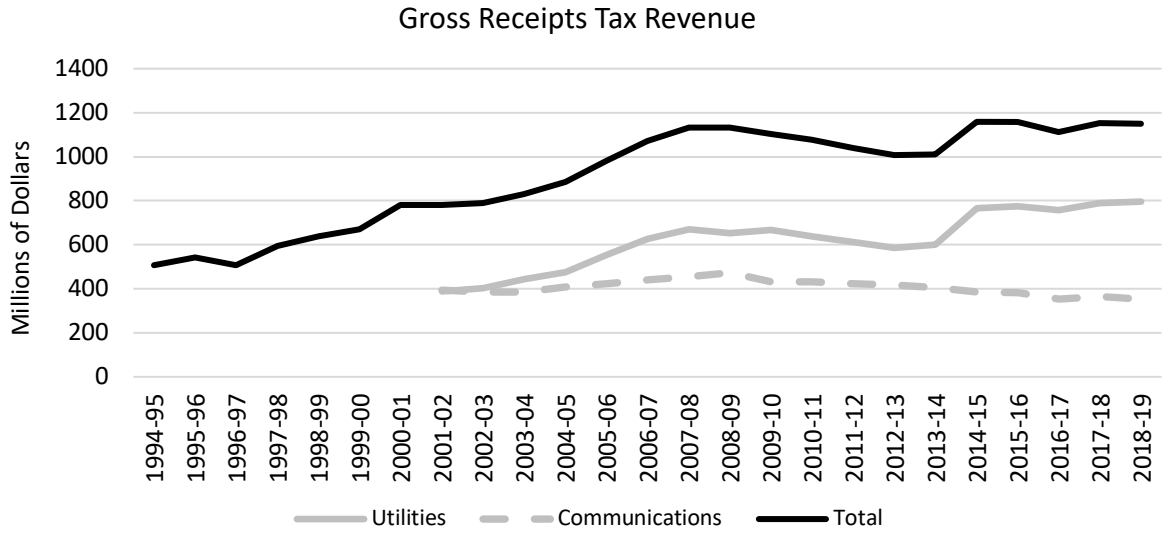
According to the *Florida Tax Handbook*, Florida's GRT originated in 1931. Collections were earmarked by constitutional amendment for funding capital outlay needs of universities and junior colleges in 1963. The constitution was amended in 1974 to include public schools. Regarding items taxed and the tax rate, it is easiest to quote from page 87 of the handbook:

> The gross receipts tax is imposed at the rate of 2.5 percent on the gross receipts of sellers of utility services (electricity, and natural or manufactured gas). In addition, a rate of 2.6 percent is levied on sales of electricity to non-residential customers not otherwise exempt. Finally, a rate of 2.52 percent is levied on the gross receipts of sellers of communications services (CST). This is comprised of a tax rate of 2.37 percent on the cable, wireless, landline and miscellaneous services tax bases, and an additional tax rate of 0.15 percent that is applied to the same tax bases, excluding landlines in residential households. The dollars generated by both of these tax rates, plus 20.7 percent of total direct-to-home satellite collections, comprise total gross receipts CST collections.

[17] Florida Department of Education, *Funding for Florida School Districts*, available at https://www.fldoe.org/core/fileparse.php/7507/urlt/Fefpdist.pdf and Florida Department of Revenue, *Florida Tax Handbook*, available at http://edr.state.fl.us/content/revenues/reports/tax-handbook/.

Figure 7 depicts GRT revenues by year from FY 1994-95 through FY 2018-19. We see the growth in the early 2000s, associated with the housing boom and then stagnant revenues thereafter. Some of the variability is due to one-off changes in tax rates or in what is included in the tax base. In 2014, a proportion of a sales tax on energy was permanently redirected to the PECO trust fund. This sales tax rate was lowered and a new tax of 2.6% was levied on the same items covered by the sales tax with the latter revenue stream directed to the PECO trust fund.[18] The legislature also transferred funds from general revenues and the Educational Enhancement Trust Fund to the PECO trust fund on a non-recurring basis from 2012 through 2016.[19]

*Figure 7*




Data from the website of the Office of Economic and Demographic Research (EDR) at http://edr.state.fl.us/Content/revenues/reports/detailed-revenue-report/index.cfm and various years of the Florida Tax handbook at http://edr.state.fl.us/content/revenues/reports/tax-handbook/.

Over the period depicted in Figure 7, GRT revenue grew at an annual rate of only 3.2%, far less than the 5.2% required to keep up with income and so maintain the adequacy of capital funding. Moreover, it has been essentially flat since 2007-08. Had GRT revenue grown at the same rate as nominal income, it would have been 57% higher in 2018-19.

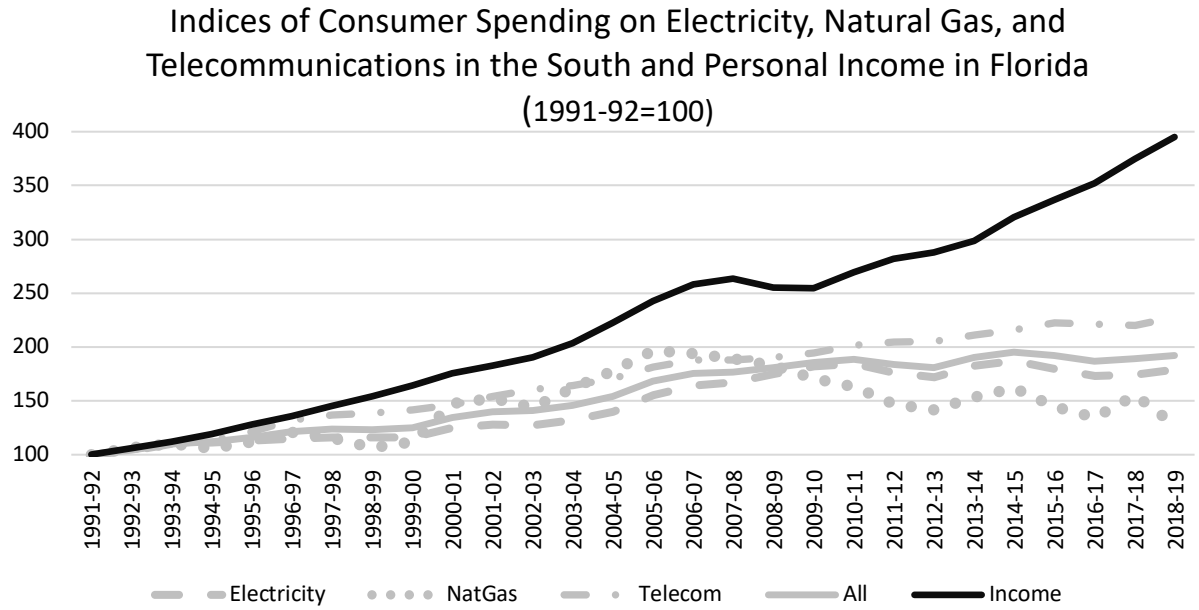
While it is well known that capital budgets for government entities in Florida have been tight, and that there are far more demands for PECO funds than there are funds available, it is useful to put this in a broader context. Figure 8 presents indices of PECO related consumer expenditures in the Southern US from the US Bureau of Labor Statistics' *Consumer Expenditure*

[18] See 1) Kathleen McGrory, March 30, 2014, "Public and charter schools compete for shrinking building funds," *The Tampa Bay Times*, available at https://www.tampabay.com/news/education/k12/public-and-charter-schools-compete-for-shrinking-building-funds/2172604/, 2) Times/Herald Tallahassee Bureau, May 3, 2014, "Florida Legislature 2014: What passed and what failed," The Tampa Bay Times, available at https://www.tampabay.com/news/politics/gubernatorial/florida-legislature-2014-what-passed-and-what-failed/2178190/, and 3) Laws of Florida, Chapter 2014-38, House Bill No. 5601, http://laws.flrules.org/2014/38.

[19] See 1) Florida Office of Economic and Demographic Research, Revenue Estimating Conference, Public Education Capital Outlay Trust Fund, *Historical PECO Appropriation*, available at http://edr.state.fl.us/Content/conferences/peco/pecohist.pdf and 2) Laws of Florida, Chapter 2015-232, Senate Bill No. 2500-A, http://laws.flrules.org/files/Ch_2015-232.pdf.

*Survey*. For the past three decades expenditures on these items have consistently grown much slower than income. The GRT tax base has been eroding for decades and continues to do so. It is simply not a suitable basis for capital funding for education.

*Figure 8*




Expenditure data from US Bureau of Labor Statistics, Consumer Expenditure Survey, at bls.gov. PECO related expenditure categories include: Electricity, Natural Gas, Telephone and related communications equipment, Telephone Services, and Internet access.

- *The Gross Receipts Tax base has been eroding for decades and continues to do so. It is not a suitable basis for capital funding for education.*

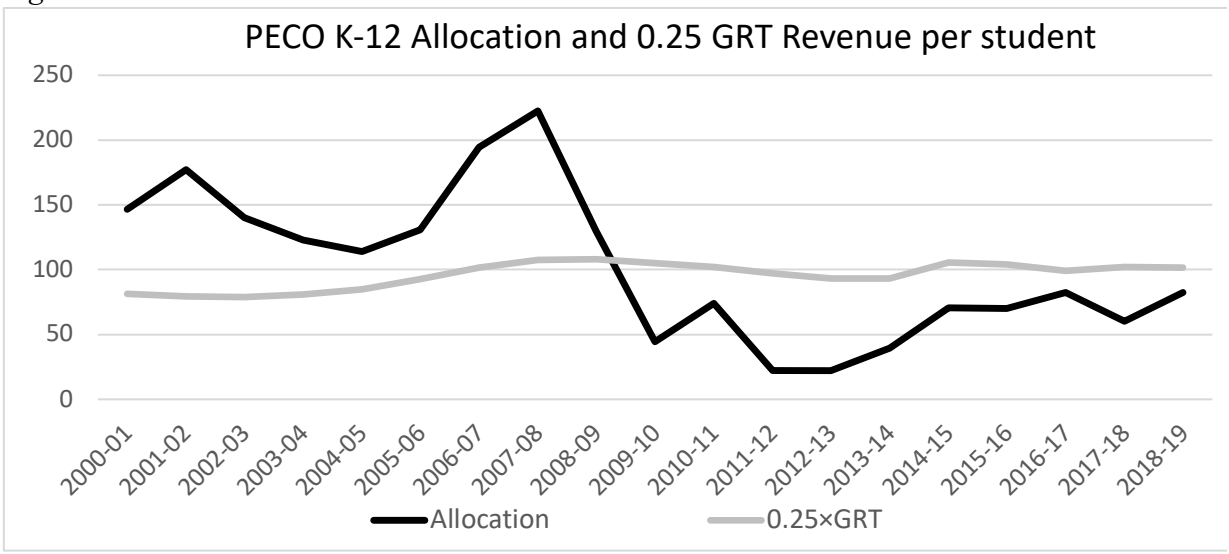
Only a portion of PECO funding is allocated to PK-12 education, and GRT revenue does not translate to PECO funding in a fixed way. Rather, some funding is allocated directly to districts, and some is used to back bond issues. Each year's allocation depends on the evaluation of capital needs and legislative discretion. To form an estimate of regular and sustainably recurring PK-12 PECO revenue, we calculate the average ratio of the PK-12 PECO appropriation to GRT revenue from 2005-06 through 2019-20, which is just under one quarter, and multiply GRT revenue by this ratio. Figure 9 shows both the PECO allocation and one quarter of GRT revenue, both per student. Over the past two decades, the regular component of PECO funding has ranged from just under $80 per student to just over $100 per student and has not kept up with nominal income per capita or even inflation.

### 6.2 Capital Outlay and Debt Service Funds

As established in Article XII of the Florida Constitution, the first proceeds from the tax on motor vehicle licenses go to the Capital Outlay and Debt Service Trust fund. These funds are made available to school districts (and Florida colleges) for capital outlay purposes. A school district may elect to bond its allocation or receive the funds as cash. CO&DS funds may be used for capital

outlay projects included on a school district's Project Priority List, which is developed from the educational plant survey as approved by the FDOE.

*Figure 9*




State appropriations from the Public Education Capital Outlay and Debt Service Trust Fund (PECO) can be found in the annual general appropriations bill. which can be accessed via the State Library and Archives of Florida at http://laws.flrules.org/. FTE is from the annual Profiles of Florida School Districts tables maintained by FDOE at http://www.fldoe.org/finance/fl-edu-finance-program-fefp/profiles-of-fl-school-diss.stml. Data sources otherwise as described in earlier figures.

CO&DS funds are derived from Motor Vehicle License and Registration fees. The *Florida Tax Handbook* details the history of these fees, dating back to 1905, with many changes along the way. Earmarking of a portion of the revenue for school capital was originally approved in November 1952 and amended in 1964 and 1972. The first proceeds are distributed to the CO&DS Trust Fund, and the remaining funds, now most of the revenue, are distributed to the State Transportation Trust Fund and General Revenue. Regarding just what is taxed, and at what rate. From page 130 of the 2021 handbook:

> Motor vehicles and mobile homes must register annually in Florida. License fees for private autos and light trucks range from $14.50 to $32.50 according to vehicle weight. License fees for truck tractors are based on gross vehicle weight and range from $60.75 to $1,322. Mobile home license fees range from $20 to $80 according to length and recreational vehicle license fees are $27 to $47.25 depending on vehicle type and weight.

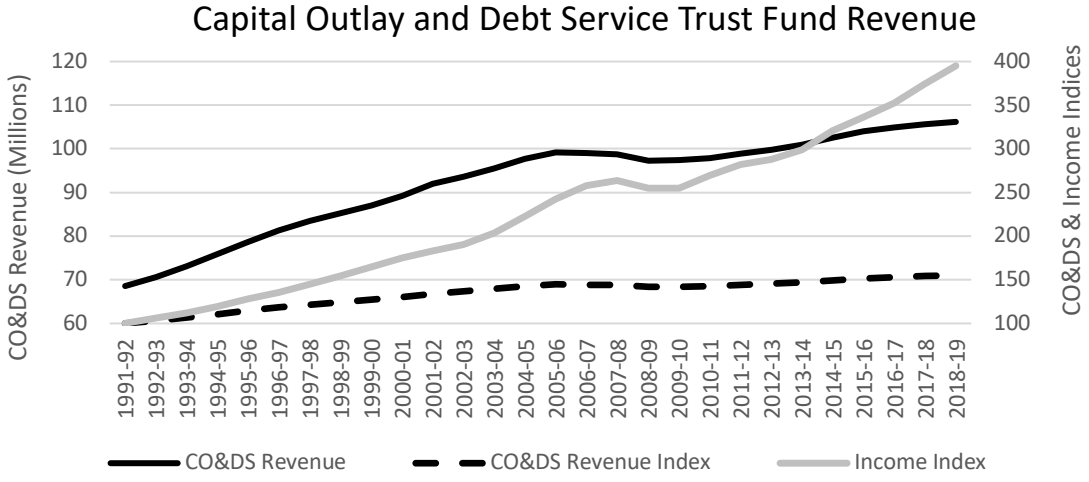
The amount of revenue available annually for each district to draw upon is determined by the district's number of instruction units. As spelled out in the constitution, each district is allotted $600 for each instruction unit from the base year and $800 for each additional instructional unit, known as growth units. For the base year of 1967-1968, there were 55,022 for the state in total.[20] For FY 2019-20, there were 91,462 growth units for the state. This would yield revenue of $106.2 million. The calculation also accounts for the need to meet prior commitments, resulting in actual funding of $112.2 million.

[20] Base units and funding and 2018 units and funding were obtained through correspondence with the Florida Department of Education.

The calculation of instructional units is set out in statute.[21] The number of FTE students in each program category is multiplied by the appropriate cost factor, with all weights (for included FTE) equal to 1 or higher, the weighted FTE count is summed, and the total is divided by 23. While the complete history of annual values of instructional units and CO&DS revenue is not available, we can recreate it with considerable accuracy given an understanding of its calculation. First, let us assume that, at least since 1991, the ratio of weighted to unweighted FTE has remained relatively stable. As a quick check on that, for the 2001 FEFP calculation, the ratio of weighted to unweighted FTE was 1.087, while for the 2018 calculation it was 1.089. For the purposes of this report we will obtain a very good approximation assuming that the statewide ratio remained constant for CO&DS purposes, beginning from the 2018-19 total instructional units, and imputing earlier values according to their FTE enrollment relative to 2018-19. Second, while in any given year actual funding is adjusted to respect prior commitments made based on instructional units, growth over time is driven by growth in instructional units, not prior commitments. So, for purposes of this report, the approximation used is $600 multiplied by base instructional units plus $800 multiplied by the difference in imputed instructional units for the year in question and base instructional units. Hereinafter this approximate value of CO&DS revenue is simply referred to as CO&DS revenue.

Figure 10 presents CO&DS revenue from 1991-92 through 2018-19. Revenue in millions is plotted on the left scale. An index of revenue is plotted on the right scale to facilitate comparison of CO&DS revenue to the income benchmark. In absolute terms, revenue tracks enrollment, with the enrollment plateau in the mid-2000s clearly visible. CO&DS revenue does not keep up with the benchmark. Since CO&DS revenue is proportional to enrollment, it approximately keeps pace with the population component of income. However, since the per unit funding amounts are fixed at $600 per base unit and $800 per growth unit, it is not possible for it to keep up with either inflation or real income per capita. Had CO&DS funding kept up with nominal income since 2001-02, it would have been 250% higher in 2018-19.

*Figure 10*




See the text for a description of the calculation of CO&DS revenue.

[21] 2020 Florida Statutes, Chapter 1010, Section 57, https://flsenate.gov/Laws/Statutes/2020/1010.57.

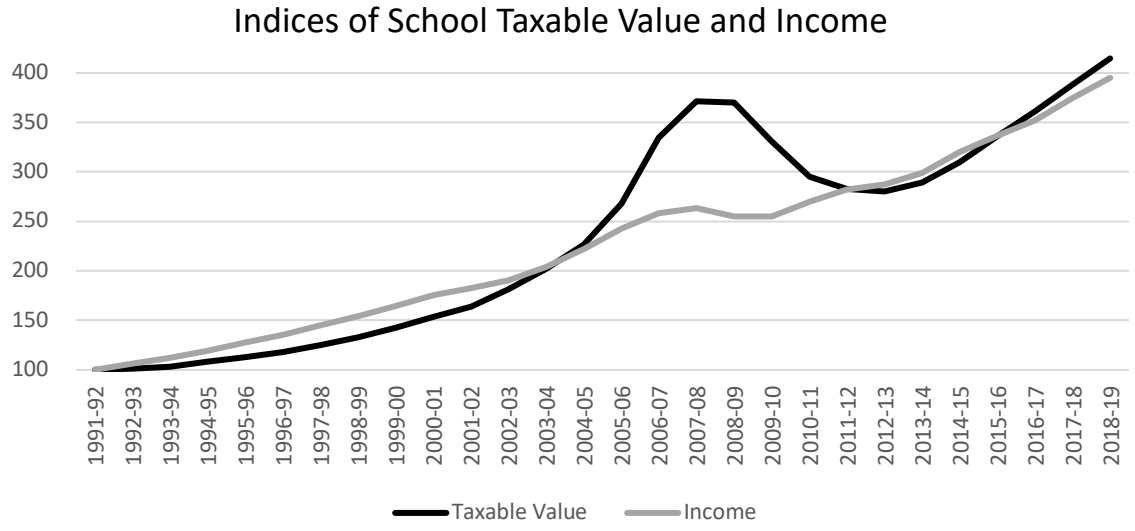
- *By construction, the revenue stream that funds CO&DS cannot keep up with inflation or growth in real per capita income, making is unsuitable as a basis for capital funding for education.*

### 6.3 Local Discretionary Capital Millage Levy

School boards set a discretionary millage rate, the proceeds of which may be used for purposes of capital outlay and maintenance. In recent years, this discretionary millage rate has been capped at 1.5, though the level of the cap has varied somewhat over time. Most, though not all, districts levy the maximum allowable discretionary capital millage.[22] For 2018-19, the following eleven districts levied a lower rate: Bay, Collier, Escambia, Franklin, Gulf, Jackson, Monroe, Santa Rosa, Sumter, Walton, and Washington. Had they levied the full 1.5 mills, total revenue in Florida from the local discretionary property tax would have been only 1.5% higher. Put differently, the fact that these elven districts levy less than 1.5 mills brings the millage rate for the state as a whole down by only 0.02 mills, to 1.48. Together these eleven districts account for only 6.4% of the states' students but also account for 10.2% of the state's taxable value. That is, they are on average capital rich districts that raise more revenue than the state average at any given millage rate.

To give some feel for the magnitude of revenues involved, revenue from this levy in 2018-19 was $3 billion, or just under $1,200 per student. Thus, this revenue source has come to dwarf both PECO and CO&DS. Figure 11 depicts the tax base by year, expressed as an index whose value is 100 in 1991-92, along with the benchmark index of income. The property tax base has kept up with income. This is not surprising. More homes, shops, and offices are needed as population grows. People buy nicer homes, and prefer nicer places to work and shop, as per capita income rises. The housing bubble and its deflation over the first decade of the 2000s are apparent,

*Figure 11*




Data on taxable value is available in the annual Profiles of Florida School Districts tables at http://www.fldoe.org/finance/fl-edu-finance-program-fefp/profiles-of-fl-school-diss.stml from the 1997 tax roll on. Earlier years may be found in the *Florida Property Valuations & Tax Data Book* at ftp://sdrftp03.dor.state.fl.us/PTO/Data_Portal/Databook.

[22] Tables including capital millage rates are available from the Florida Department of Education's *Profiles of Florida School Districts* at http://www.fldoe.org/finance/fl-edu-finance-program-fefp/profiles-of-fl-school-diss.stml.

but do not alter the longer run conclusion that, unlike PECO and CO&DS revenues, the property tax base has kept pace with the need for school capital funding—though actual revenue also depends on the millage rate cap, which has been changed occasionally.

- *Property values are likely to grow with population, inflation, and real income per capita. Thus, the property tax base is a suitable basis for local capital funding for education.*

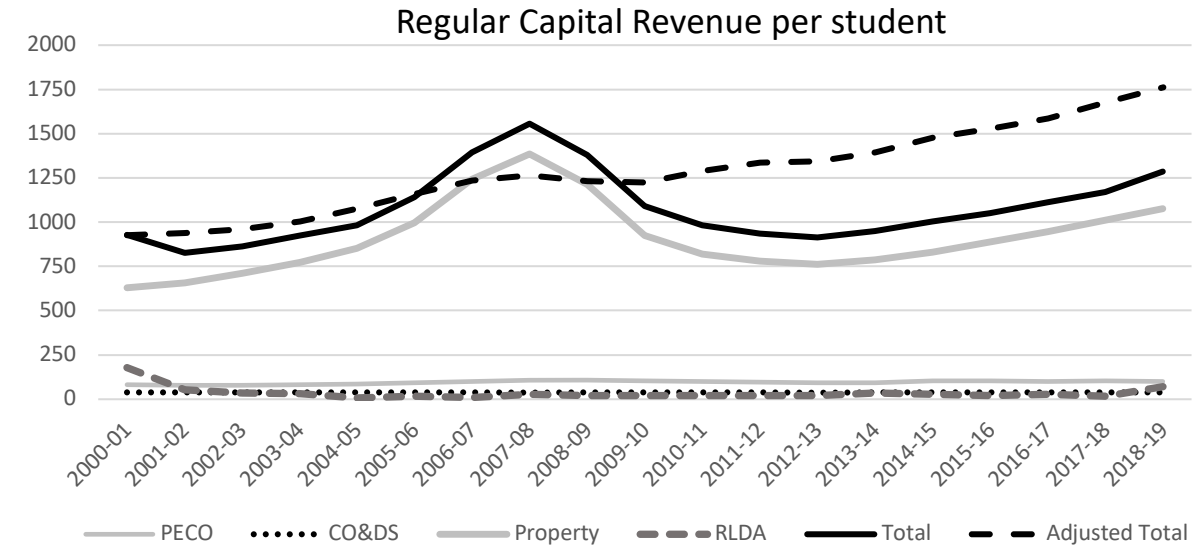
### 6.4 Regular Discretionary Legislative Allocation

The legislature typically makes additional funds available for capital outlay purposes. The annual Florida Department of Education publication *Profiles of Florida School Districts* provides much more detail about funding and expenses.[23] Of interest here is the entry for "Other State" revenue in the "Capital Project Revenue" section. The "Other State" entry recurs every year and the amount is relatively stable. While it is not formulaic, it arguably represents dependable state allocations for capital projects across districts outside of CO&DS or PECO funding. Thus, we refer to this as the Regular Discretionary Legislative Allocation, RDLA. RDLA averaged $35.2 per student from 2000-01 through 2018-19, nearly equal to CO&DS funding and just over a third of sustainable PECO funding.

### 6.5 Regularly Recurring Capital Revenue

Figure 12 shows regular revenue per student and each of its components. The figure also shows an adjusted total indicating what would have occurred if total regular revenue had kept up with the nominal income benchmark.

*Figure 12*




Data sources and calculations described in earlier figures and in the text.

CO&DS had eroded to a near negligible source by the 2000s. On average it accounted for only 3.46% of regular funding over this period. This is the obvious outcome when a tax or fee is

[23] Florida Department of Education, *Profiles of Florida School Districts*, various years, available at http://www.fldoe.org/finance/fl-edu-finance-program-fefp/profiles-of-fl-school-diss.stml.

determined in such a way that revenue cannot grow with inflation or real income per capita. Like CO&DS revenue, RDLA revenue was nearly negligible, accounting for only 3.27% of revenue over the period shown. There has been no tendency for RDLA per student to increase over time to keep up with inflation or income.

The figure also shows that sustainable PK-12 PECO funding (estimated as one quarter of GRT receipts) had eroded to at most a minor source of funding by the 2000s. Sustainable PECO funding constituted only 8.88% of regular capital funding over this period. This reflects the long run decline of the GRT tax base. This is not an obvious mathematical outcome, as for CO&DS. The GRT is an ad valorem tax. Expenditures on the items that comprise the GRT tax base could have grown with inflation, real income per capita, and population. Or faster. But they did not. This is an example of the risks of tying funding for a general interest program, such as education, to a narrow tax base. Note that the same could be said of the CO&DS tax base. Even if the CO&DS tax revenue flowing into the CO&DS trust funds had been based on an ad valorem tax, there is no reason to count on motor vehicle registrations keeping pace with population, inflation, or real income per capita over the long run.

The lion's share of capital funding accrues through the local property tax. On average, property tax revenue was 84.39% of regular capital funding from 2000-01 through 2018-19. The property tax of course kept pace with income. The reasons for this have been discussed—it is an ad valorem tax on an item whose market value is very likely to grow proportionally with inflation, real per capita income, and population over time. The overall pattern is that, while property tax revenue kept up with the benchmark, none of the three regular state sources did so.

- *Regular state sources of revenue for school capital funding have eroded over time, largely because they are based on fixed tax rates or tax bases that are too narrow. As a result, the lion's share of school capital funding comes from the local property tax base.*

There are two immediately obvious negative consequences of this pattern. The first is that the relative adequacy of the funding available to support the capital services devoted to Florida's average student has declined—dramatically. By 2018-19 recurring capital funding per student was only $1,288, $474 less than it would have been had it kept up with the capital spending benchmark since 2000-2001. If the GRT and the CO&DS tax bases and the RDLA had kept pace over the past two decades, there would have been $1.3 billion more available for the capital needs of our PK-12 schools in 2018-19. These trends were apparent before 2001-02, and will likely continue past 2018-19, so this understates the severity of the long-term trend.

The second is that regular PK-12 capital funding now depends almost entirely on the local property tax base. The property tax base, however, is very unequal across districts, and the revenue is not equalized. Even if the state could have, in the past, used its discretion over PECO revenues and the RDLA to address equity concerns, there is simply no scope to do so now without a very large increase in state revenue devoted to PK-12 capital funding. The nature of the current tax bases for capital outlay means there is no way for the state's current capital funding approach to meet the requirement for uniformity in the state's constitution. Florida's PK-12 capital spending is inadequate relative to our own past and inequitable.

- *The substantial and ongoing erosion of regular state sources for capital funding results in declining adequacy relative to any benchmark and means regular state funding is insufficient to offset substantial inequity resulting from variation in local taxable value per student.*

### 6.6 Other Capital Funding Sources

We have considered the primary sources of recurring revenue available to school districts for capital outlay. There are other, less regular, sources of governmental revenue. There are also non-revenue sources of funding. We consider them now.

The state can always decide to appropriate additional funds from general revenue on an ad hoc basis. For example, $42 million was appropriated for 2020-2021 for the school hardening program. Funds from the Education Enhancement Trust Fund (EETF), which includes the net proceeds of the Florida Lottery and the tax proceeds on slot machines in Broward and Miami-Dade counties, may be used to meet capital needs, particularly associated with the Class Size Reduction and Educational Facilities Lottery Revenue Bond Program. Funds to comply with the class size limitations in Article IX of the Florida Constitution must come exclusively from state funds.

Alternative sources of revenue are also available to districts. If revenue from the regular discretionary capital millage levy (1.5 mills for 2020-21) is insufficient to cover certain prior commitments or to meet critical needs, the district may spend a portion of its discretionary operating millage revenue (0.25 of 0.748 mills for 2020-21) for such purposes. District residents may, by vote, approve additional capital millage for a period not to exceed two years. School boards may levy a sales surtax of up to 0.5 percent for capital outlay purposes if approval is obtained by referendum. Additional levies may be made to service existing debt if other revenues are insufficient and voters approve (limitations apply). School districts may levy impact fees when a new housing unit is built. While this may be a significant source of revenue for some districts, impact fees generally are fraught with political and legal difficulties.[24] Moreover, data to accurately assess their regularity and magnitude is not available to the best of our knowledge. For example, while they are discussed as a source of revenue to local school districts in the *Florida Tax Handbook*, no data on how much is collected, in aggregate or by district, is available therein.

Other funding sources include federal revenues for debt service, federal stimulus funding, sales of assets, spending down account balances carried forward from prior years, and borrowing through bond issues, lease-purchase agreements, certificates of participation, or other means.

To get at least a qualitative sense of the relative importance of these irregular funding sources, we analyzed district Five-Year Education Work Plans.[25] Specifically, we analyzed work plans from 2007-2008 through 2017-2018 for seven school districts: Broward, Columbia, Duval, Escambia, Hernando, Hillsborough, and Sarasota. These plans are produced annually by each Florida school district and submitted to the Florida Department of Education. They include plans

[24] See, for example, these stories on the fight over school impact fees in Santa Rosa County. Annie Blanks, May 21, 2019, "Santa Rosa County School District leaders vow to continue fight for impact fees," *Pensacola News Journal.* https://www.pnj.com/story/news/2019/05/21/santa-rosa-county-school-district-leaders-vow-continue-fight-impact-fees/3744118002/. Annie Blanks, July 2, 2020, "Judge forces Santa Rosa to cease collection of education impact fees temporarily," *Pensacola News Journal* https://www.nwfdailynews.com/story/news/2020/07/02/judge-forces-santa-rosa-to-cease-collection-of-education-impact-fees-temporarily/112575468/.

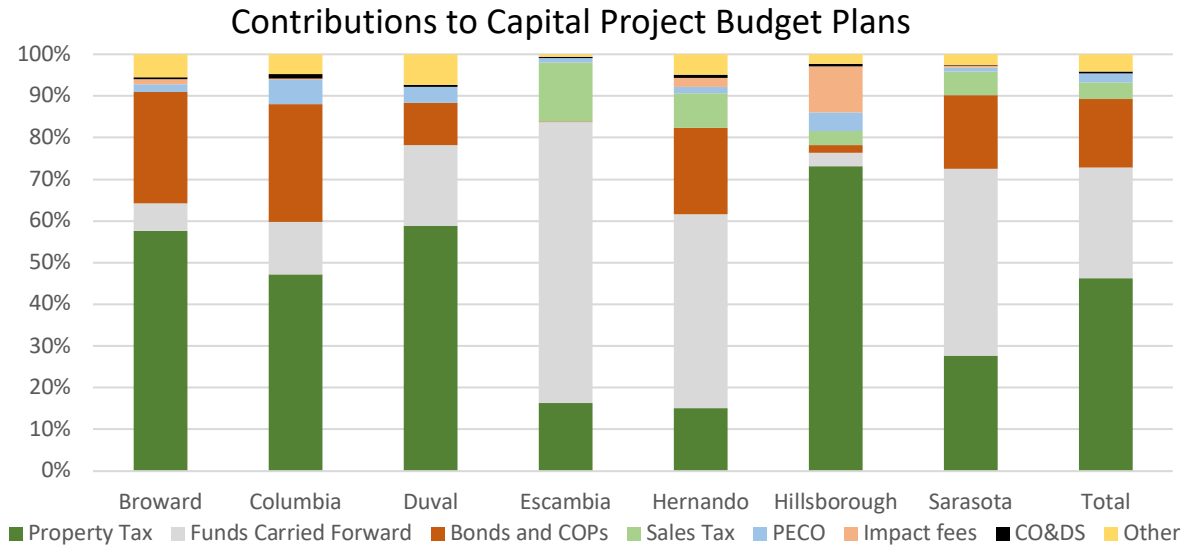
[25] Workplans are available on the Florida Department of Education's website http://www.fldoe.org/finance/edual-facilities/wkplans/2007-2008.stml.

for how capital outlay funds will be expended in the coming year as well as longer-term plans for capital outlays. They also include an estimate of the funding sources for capital outlays in the coming year. A major caveat is that these are estimates.

We group funding into eight categories: PECO, CO&DS, Property Tax, Sales Tax, Impact Fees, Debt, Carry Forward, and Other. Other represents ad hoc revenue sources, including significant state funding related to capital projects to comply with the class size amendment. Debt and carry forward are immediate funding sources, but not revenue sources. Carry forward must be built up by accumulating revenues from other sources. Debt must be serviced by accruing revenues as well. Figure 13 shows the relative contributions of each category in each of these counties and in total, aggregated over the 11 years of data collected.

Unsurprisingly, the largest funding source, both in total and for most districts, was the property tax. It accounted directly for 45.3% of total funds over the period. Next was funds carried forward. However, these funds must have been raised through some revenue source, and since the property tax is the largest such source, it is likely much of this funding was also raised through the property tax in earlier years. The third largest source was new debt, whether bonds or COPs. These represent claims on future revenue. Most likely, much of the debt service for these bonds will depend on property tax revenues intended for debt service (not included in this chart). Notice that when combined, these three funding sources accounted for nearly 90% of planned capital outlay expenditures in total and over 75% in each of the seven districts. The property tax directly accounts for half of this total, and likely indirectly accounts for much of the rest.

*Figure 13*




Unsurprisingly given the preceding analysis, CO&DS revenue is all but negligible. PECO is not negligible, but is minor in every county but Columbia, the one small rural county among the group, where it is 5.8% of direct capital outlay funding. Local option sales taxes and impact fees are 3.9% and 2.1% of total funds over the period, respectively, and are more important in some counties. It is likely some carry forward accrues from these sources, and it is possible some debt service may be paid through optional sales taxes as well, so the share of revenue accounted for by these sources might be a bit higher. All other sources combined accounted for only 4.1% of planned

capital funding over these years. Line by line inspection of the data shows no notable commonalities in the composition of "Other" revenues, certainly nothing that suggests a widespread recurring revenue source.

While they are relatively minor sources of revenue, neither local option sales taxes nor impact fees are negligible. However, both require local political approval in ways that do not apply to the other revenue sources, making them unpredictable. Impact fees must also satisfy a rational nexus test showing they apply only to new development that creates demand for new school facilities, further limiting their use as a source of dependable capital funding. It is therefore not surprising that these two sources constitute a small share of funding overall and are negligible or zero in some counties. Thus, it seems reasonable to focus on CO&DS, PECO, the local discretionary capital property tax, and what we termed the regular discretionary legislative allocation as the available sources of predictable, regularly recurring, capital revenue.

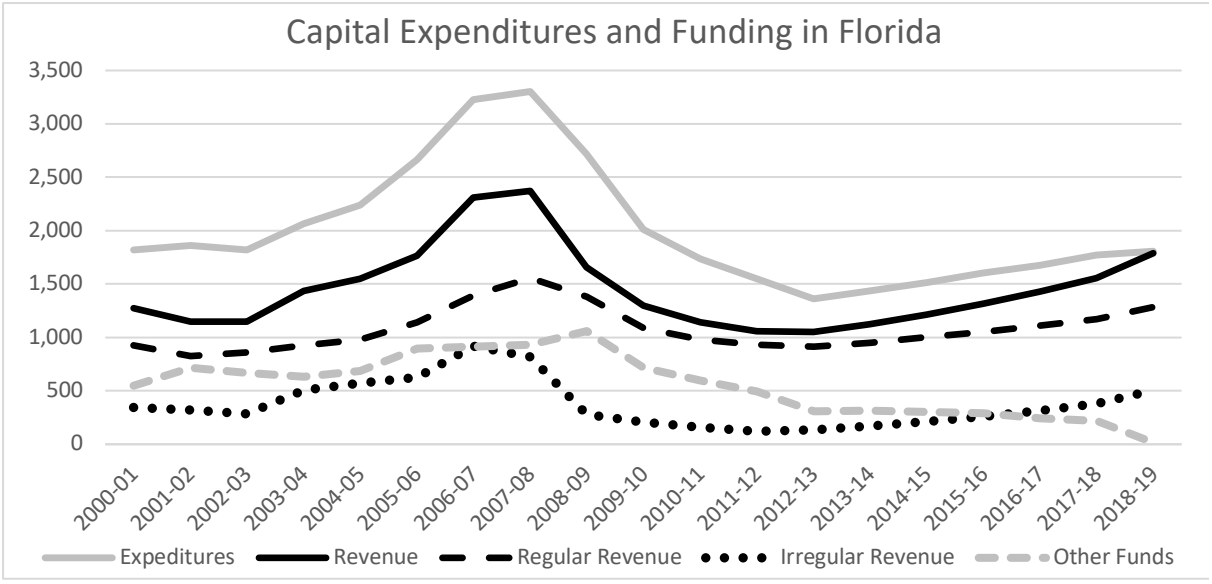
### 6.7 Revenue and Other Capital Funding: The Big Picture

We have considered regular sources of revenue for capital purposes and other sources of capital funding, respectively. We now combine this information, along with data on capital expenditures, to present a picture of the totality of annual capital funding from 2000-01 through 2018-19. Capital expenditures are the sum of expenditures for maintenance, debt service, and both capitalized and noncapitalized capital outlay, as reported in *Profiles of Florida School Districts*. Revenue is combined local, state, and federal revenue for capital projects and debt service, as reported in *Profiles of Florida School Districts*. Regular revenue is the sum of sustainable PK-12 PECO revenue, sustainable CO&DS revenue, RDLA, and potential property tax revenue. The first three are as defined previously. Potential property tax revenue is simply the revenue raised holding the millage rate constant at the 1.5 mills allowed in 2018-19. We estimate irregular revenue by subtracting regular revenue from combined local, state, and federal revenue for capital projects and for debt service, as reported in *Profiles of Florida School Districts*. Variations in actual CO&DS or PECO revenue around our estimates of the regular sustainable levels of these revenues will show up as irregular revenue given this definition. This measure of irregular revenue includes interest on account balances. Interest on account balances would ideally be a separate category, but that is infeasible. Since interest on account balances is likely to be very small relative to other revenue sources, it should have little impact on irregular revenue.

We subtract revenue from expenditures to form a residual measure of other capital funding. Capital expenditures typically differ from the sum of regular and irregular revenue. That difference represents net borrowing, or the net change in debt. The change in debt is composed of a combination of bond issues, certificates of participation or lease purchase agreements, and spending down accumulated carry forward held in account balances. Of course, if enough debt is retired, the net change in debt can be negative. In any case, the difference between expenditures and regular and irregular revenues represents the change in net indebtedness, broadly understood.

Expenditures, revenue and its regular and irregular components, and other funding, expressed per student, are shown in Figure 14. Regular revenue grew rapidly through 2007-08, largely due to the housing boom and resulting increase in property values. Irregular revenue reached its highest level in 2007-08 as well, and other funding reached its peak in 2008-09. The growth in expenditure and revenues through the mid-2000s reflects in part the high need for space resulting from the baby boom echo passing through schools, the effect of which on enrollment peaked in the early 2000s. It also reflects the need to comply with the 2002 Florida Class Size Reduction Amendment (CRSA), which likely was at least partly a response to crowding induced by the baby boom echo. The increase in revenue and spending also reflects the economic expansion related to the housing boom. After peaking, revenues and expenditures declined as enrollment flattened, the requirements of the CRSA were largely met, and the housing bust and ensuing recession unfolded. By 2018-19, regular and irregular revenue had recovered slowly for several years from their low points in 2012-13 and 2011-12 respectively. The annual change in debt, as reflected by other funding, had declined to near zero by 2018-19.

*Figure 14*




An increase in borrowing related to the CRSA must eventually be followed by a decrease in borrowing to maintain whatever level of debt finance is desired, so neither the fact that the residual rose after the CRSA or the fact that it was near zero in 2018-19 are unusual. Nor is the fact that capital expenditures would respond to the baby boom echo or the surge in property values during the housing boom of the mid-2000s. What is remarkable here, however, is that even without adjusting for increases in prices or incomes, capital expenditures per student were lower in 2018-19 at $1,807 than they were in 2000-01 at $1,821. The decline will, of course, be much more substantial after adjusting for inflation, increases in capital costs, and increases in real incomes.

- *Even without adjusting for inflation, increases in capital cost, or increases in real incomes, Florida invested less per student in capital resources for its students in the late 2010s than it did in the early 2000s.*

# 7. Standard Capital

Florida has established standards for capital per student. While it is unreasonable to make absolute analytical statements about adequacy, due to the subjective judgements involved, it is possible to determine whether regular revenue is sufficient to sustain capital up to these standards. To do so, we must first estimate the cost of meeting them. That is the task we take up in this section.

## 7.1 The Cost of Constructing a Standard Student Station

The most basic capital need is for well-appointed classrooms, with desks, computers, and other necessary durable items, and for the other spaces necessary for running schools such as a cafeteria, library, etc. Florida law requires FDOE and the Florida Legislative Office of Economic and Demographic Research (EDR) to annually review the cost per student station.[26] The review for 2020-2021 estimates the cost per student station built to current Florida public school standards, and including computers, desks, and other necessary items.[27]

In addition to historical cost, which may not be the minimum cost for a minimally sufficient student station due to district choices, the report provides results for two models, one from EDR and one from FDOE. The EDR model, which reflects a moderately lower cost, is for a prototype that did not meet all applicable standards for Florida's public schools, leaving the FDOE model as the better choice for this purpose. The cost was estimated to be $23,231 for an elementary school, $25,049 for a middle school, and $31,142 for a high school as of January 2019. If we take the average of these estimates weighted by the share of Florida's public-school enrollment in each school type, we get $26,102.

Similarly, according to the report, actual average costs per station incurred by schools in 2018 were $28,925 for elementary schools, $23,426 for middle schools, and $25,091 for high schools. The enrollment weighted average of these is $26,441. While actual costs may be slightly higher than costs estimated from the model, that may simply be because some districts paid for additional options or size beyond the minimum specifications included in the model. This seems particularly likely since elementary schools cost the most in the actual data and the least in the models. However, the model estimates and historical costs agree reasonably closely, giving confidence that the model is reasonable.

The costs above focus narrowly on construction costs, leaving out several other relevant and necessary categories of costs for which schools report data.[28] These are site improvement, legal and administrative services, making public utilities available, correcting drainage or forming retention areas, providing access to public roads, correcting any environmental problems, safety provisions, and site acquisition. Schools also report costs related to meeting standards so that the school building may serve as a hurricane shelter; however we ignore these since they are not directly related to the provision of education.

[26] 2020 Florida Statutes, Chapter 1013, Section 64, https://flsenate.gov/Laws/Statutes/2020/1013.64

[27] Florida Department of Education. 2020. *Review and Adjustment for Florida's Cost per Student Station*. Accessed September 5, 2021 at https://www.fldoe.org/core/fileparse.php/7738/urlt/2020AnnCSSR.pdf.

[28] This is the data on construction costs reported by schools is available at https://www.fldoe.org/finance/fco/cost-of-construction/public-schools.stml.

We calculated the relative contribution of these excluded costs to total cost using data reported by schools from 2015 through 2019. Facilities safety costs were not reported prior to 2018. We assume that the relevant costs would have been the same proportion of total costs in earlier years under the same requirements. The results are shown in Table 2. These excluded costs represent 17.48% of total costs. Thus, we divide the model cost estimate by 0.8252 to estimate the full cost of a student station up to state standards at $31,629. This is an underestimate of the minimum cost of capital because it leaves out several necessary costs. For example, school buses and a transportation garage, district vehicles and equipment used for maintenance, and school board offices.

*Table 2*: Cost Shares by Category

| Category | Share |
|---|---|
| *Included in Model* | |
| Architect and Engineering Fees | 5.08% |
| Building Contract Cost | 71.70% |
| Furniture and Equipment | 5.74% |
| *Subtotal* | 82.52% |
| *Excluded from Model* | |
| Site Procurement | 3.55% |
| Other Site Related | 11.95% |
| Safety | 1.34% |
| Legal and Administrative | 0.63% |
| *Subtotal* | 17.48% |

### 7.2 Additional Date Needed to Estimate the Annualized Cost of a Student Station

As discussed in sections 3 and 4, to estimate the *annualized* cost to sustain standard capital we require estimates of the rate of depreciation assuming optimized maintenance, optimized maintenance spending per dollar of capital, the interest rate on district debt, and the desired growth rate of capital. We now turn to providing reasonable estimates of these parameters.

Maintenance Expenditure Rate. In response to the perception that a backlog of maintenance was undermining the nation's public infrastructure, in particular government buildings, the National Research Council's Building Research Board (BRB) undertook a review of the maintenance and repair activities of government agencies and prepared recommendations as to how these activities might be improved.[29] The BRB recommended a budget allocation for routine maintenance and repair in the range of 2 to 4 percent of the aggregate current replacement value of facilities, excluding land. Where a backlog of deferred maintenance exists, the allocation would need to be higher until the backlog was cleared.

Maintenance includes things like lubrication and cleaning of equipment, scheduled replacement of parts, painting, and other actions to assure continuous service and to prevent breakdown. Repair is work to restore damaged or worn-out property to normal operating condition. This includes replacement of failed subsystems when deemed more cost effective than repair. Repairs are curative while maintenance is preventative.

Maintenance and repair expenditures are necessary to realize the design service life of the building. They do not prolong the design service life of property or equipment or add to the asset's value other than by preventing declines in value due to disrepair. Maintenance and repair expenditures do not include upgrades, major remodeling, extensive repairs due to major disasters, alterations, or operational expenses such as the cleaning performed by janitorial staff.

[29] National Research Council 1990. *Committing to the Cost of Ownership: Maintenance and Repair of Public Buildings*. Washington, DC: The National Academies Press. https://doi.org/10.17226/9807.

Depreciation Rate. A well-maintained building will have a long service life. However, it will eventually need to be replaced. As shown in *Table 3*, The U.S. Bureau of Economic Analysis uses fifty years as the estimate of the useful lifetime of structures such as schools. If the age distribution of buildings were uniform and every building was replaced after 50 years, depreciation costs would be 2% annually. Many buildings stay in service longer than that before being demolished. However, such buildings have typically undergone major renovations, remodeling, and upgrading that amount to rebuilding the building a bit at a time. Put differently, such buildings have had new investment put into them to replace depreciation, in addition to having been maintained and repaired. Thus, the effective age of such buildings is likely far less than 50 years, regardless of when they were first constructed. Computers and other equipment necessary for the student station but not part of the facility itself will need to be replaced more frequently than the building.

*Table 3* lists service lives and the implied annual (linear) depreciation rate for several relevant asset types.[30] Based on these figures, it is reasonable to assume the rate of depreciation of school furniture and equipment is likely somewhat larger than 10% but less than 20%. We would need a more fine-grained breakdown of expenditures on furniture and equipment to attempt a precise calculation of the relevant depreciation rate. However, if we assume 0% for land, 10% for furniture and equipment, and 2% for everything else, and apply the weights from *Table* 2, the resulting overall rate of depreciation is 2.4%. If we instead assume a 20% rate of depreciation for furniture and equipment, the overall rate of depreciation is 3%.

*Table 3*: Service Lives and Implied Depreciation Rates

| Asset Type | Service Life | Depreciation Rate |
|---|---|---|
| Educational Buildings | 50 | 0.02 |
| Prepackaged Software | 3 | 0.33 |
| Lawn & Garden Equipment | 10 | 0.10 |
| Commercial Furniture | 14 | 0.07 |
| Sporting Equipment | 10 | 0.10 |
| Personal Computers | 5 | 0.20 |
| Vehicles | 8 | 0.13 |

Capital Growth. Desired capital growth consists primarily of two components, growth due to increases in the number of students and growth due to increases in real income per capita. Based on the medium projections of the Florida population ages 5-17 from 2020 through 2040 available on the EDR website, the number of students will grow at about 0.88% per year.[31]

Using US per capita income and the GDP deflator from the US Bureau of Economic Analysis, from 1970 through 2020 real income per capita in the US grew at an annual rate of 2.01%. The labor force to population ratio grew at about 0.85% annually over this period.[32] This suggests annual growth in real income per worker was approximately 1.15%. Future growth in income per capita will depend on growth in real income per worker and changes in workers per

[30] Except for personal computers and vehicles, service lives are taken directly from Table C in U.S. Department of Commerce, Bureau of Economic Analysis (2003) *Fixed Assets and Consumer Durable Goods in the United States, 1925–97*, Washington, DC: U.S. Government Printing Office. The document is available at https://www.bea.gov/system/files/methodologies/Fixed-Assets-1925-97.pdf. For personal computers and vehicles, the useful service life is taken to be the number of years before the asset's value falls below 10% of its market price, taken from Table B.

[31] The population projections are available at http://edr.state.fl.us/content/population-demographics/data/pop_census_day-2020.pdf.

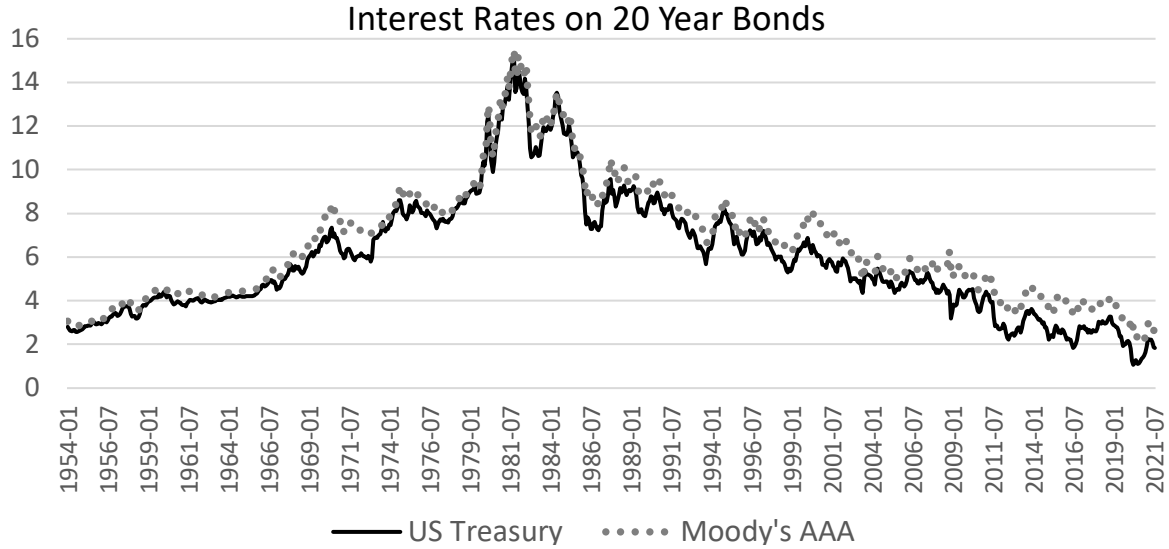
[32] Historical data on population and the size of the labor force is from the St. Louis Federal Reserve Economic Database (FRED) at https://fred.stlouisfed.org.

capita. The labor force to population ratio is forecast to decline by something like 0.27% per year from 2020 through 2040, largely due to the retirement of the baby boomers and relatively slow growth of the working age population.[33] Assuming real income per worker continues to grow at about 1.15% per year, this suggests annual growth in real income per capita will slow to approximately 0.88% over the next 20 years (1.0115×0.9973-1=0.0088).

Combining student and income growth, if we assume an income elasticity of demand of 0.5, the low end of the reasonable estimates from section 5, the desired annual growth of capital is $1.0088 \times 1.0088^{0.5}-1$, or 1.3%. If the income elasticity of demand is instead 1, the high end of the reasonable estimated from section 5, desired annual growth of capital is 1.0088×1.0088-1, or about 1.8%. If we use 0.9 as the estimate of income elasticity, which we deem the best estimate, desired growth in capital is 1.7% per year.

Interest on Debt. Figure 15 shows the market yield on U.S. Treasury Securities at 20-year constant maturity and the yield on Moody's AAA rated corporate bonds 20 years or more from maturity. The average Treasury security rate from January 2020 through August 2021 was 1.61%, and the average AAA corporate bond rate was 2.58%. Going back to January 2000, the average Treasury rate is 3.8% and the average AAA corporate rate is 4.82%.

*Figure 15*




We can see from the figure that the interest rate on AAA corporate bonds tends to run nearly a full percentage point higher than the interest rate on US Treasury securities. This largely reflects that US Treasury securities are essentially as safe an investment as can be found. Just like AAA corporate bond rates reflect a risk premium over Treasury securities, school district debt will reflect a premium relative to U.S. Treasury securities as well.

We can also see that interest rates have trended down since the early 1980s. However, the annual rate of inflation in spring 2021 was higher than it has been in decades. In April 2022, the US Bureau of Economic Analysis' Personal Consumption Expenditure price index was over 6% higher than in April 2021. The last time it rose that much from the year before was February 1982.

[33] Projections from the US Bureau of Labor statistics at https://www.bls.gov/spotlight/2016/a-look-at-the-future-of-the-us-labor-force-to-2060/home.htm.

That was the end of a period beginning in August 1973 in which the change from 12 months before was over 6% 90 out of 103 months.[34] Of course, how long inflation will remain high is uncertain, but it could be a long time. As of May 2022, inflation expectations remained high, but uncertainty about them also remained high.[35] All else equal, nominal interest rates rise with expected inflation. As a result, interest rates are likely to be somewhat higher than they have been over the last few years for some time. We might reasonably expect 20-year Treasury interest rates to be between 3% and 5%, with rates on AAA bonds and school district debt slightly higher. Thus, 4% to 6% is a reasonable range for interest rates on school district debt issued over the next several years if inflation abates in the not-too-distant future. If inflation remains high for an extended period, this range might turn out to be too conservative.

### 7.3 The Annualized Cost of Meeting Minimum Capital Standards

Based on the information provided above, we now estimate of the *annualized* cost of meeting minimal capital standards. As discussed in sections 3 and 4, it is the product of the cost of the standard ($k_s$) and the sum of 1) the interest rate on debt multiplied by the fraction of capital not equity financed, 2) the desired growth rate of capital multiplied by the fraction of capital that is equity financed, 3) optimized maintenance expenditures per dollar of capital, and 4) the depreciation rate given optimized maintenance.

We will construct three estimates. One is conservative, in that it assumes all parameters take values at the end of the reasonable ranges defined above that result in the lowest cost. One is liberal, in that it assumes all parameters take values at the end of the reasonable ranges defined above that result in the highest cost. The last one, central, assumes parameters come from the midpoint of the range described above or, in the case of the income elasticity of demand for education, represents the best or most common estimate from the literature. Since we have cost data from 2015 through 2019 that has not been adjusted to constant year dollars, it is reasonable to think of the resulting cost estimates as indicative of the cost per student station in the late 2010s. The specific assumptions and resulting cost estimates are as follows.

<u>Conservative</u>

Assumptions:
1) Optimal maintenance and repair expenditures are 2%, the low end of the BRB range.
2) Depreciation is 2.4%, the low end of the reasonable range of 2.4% to 3% laid out above.
3) The income elasticity of demand for capital per student is 0.5 so desired capital growth is 1.32%.
4) All capital is equity financed.
5) Since all capital is equity financed, we need make no assumption about the interest rate on debt.
6) Necessary capital costs exceed those included in a basic student station by 1%.

Under these assumptions, the cost of meeting minimal standards is 5.72% of the cost of a base student station multiplied by 1.01, or $1,827.

<u>Central</u>

Assumptions:
1) Optimal maintenance and repair expenditures are 3%, the midpoint of the BRB range.

[34] The Personal Consumption Expenditure price index is available at https://fred.stlouisfed.org/series/PCEPI#0.
[35] See the New York Federal Reserve's press release form June 13, 2022 discussing inflation expectations, which is available at https://www.newyorkfed.org/newsevents/news/research/2022/20220613 .

2) Depreciation is 2.7%, the midpoint of the reasonable range of 2.4% to 3% laid out above.
3) The income elasticity of demand for capital per student is 0.9 so desired capital growth is 1.68%.
4) The interest rate on debt is 4.5%.
5) Equity accounts for 90% of capital assets.
6) Necessary capital costs exceed those included in a basic student station by 3%.

Under these assumptions, the cost of meeting minimal standards is 7.66% of the cost of a base student station multiplied by 1.03, or $2,495.

Liberal

Assumptions:
1) Optimal maintenance and repair expenditures are 4%, the high end of the BRB range.
2) Depreciation is 3%, the high end of the reasonable range of 2.4% to 3% laid out above.
3) The income elasticity of demand for capital per student is 1, so desired capital growth is 1.76%.
4) The interest rate on debt is 6%.
5) Equity accounts for 80% of capital assets.
6) Necessary capital costs exceed those included in a basic student station by 5%.

Under these assumptions, the cost of meeting minimal standards is 9.61% of the cost of a base student station multiplied by 1.05, or $3,192.

These three scenarios are summarized in *Table 4*.

*Table 4*: Per Student Cost to Meet Capital Standards

| | Scenario | | |
|---|---|---|---|
| **Item** | **Conservative** | **Central** | **Liberal** |
| Maintenance Rate ($m$) | 0.020 | 0.030 | 0.040 |
| Depreciation Rate ($d$) | 0.024 | 0.027 | 0.030 |
| Equity to Asset Ratio ($f_E$) | 1.000 | 0.900 | 0.800 |
| Income Elasticity ($E_y$) | 0.500 | 0.900 | 1.000 |
| Capital Growth Rate ($g_K$) | 0.013 | 0.017 | 0.018 |
| Interest Rate ($i_D$) | na | 0.045 | 0.060 |
| $f_E g_K+(1-f_E)i_D+m+d$ | 0.057 | 0.077 | 0.096 |
| Other necessary capital costs | 0.010 | 0.030 | 0.050 |
| Annualized Cost per student | 1,827 | 2,495 | 3,192 |

- *The annualized cost per student to meet Florida's standards for capital in PK-12 schools as of the late 2020 likely falls between an overly conservative estimate of $1,827 and a liberal estimate of $3,192. Assuming central values for all parameters yields $2,495 as a reasonable point estimate.*

# 8. Adequacy

In section 2 we argued that making absolute, sweeping, statements about adequacy was an all but impossible task. The level of education funding that is adequate depends on our values. How important is education to us and how much are we willing to sacrifice to make things better for our youth? Thus, the determination of what is adequate is largely left to the discretion of our elected representatives in the legislature. However, it is possible to make narrower statements. Indeed, the Supreme Court of Florida left open the possibility that narrower questions may be justiciable.

In this section we formulate answers to two narrow questions about adequacy. First, is capital funding sufficient to sustain the state's capital standards? Second, how does our investment in school capital compare the past, after adjusting for changes in population, prices, and income?

## 8.1 Adequacy Relative to Florida's Capital Standards

Given the results of previous sections, it is straightforward to determine whether recurring annual capital funding falls short of the estimate(s) of the (lower bound of the) annualized cost of sustaining capital standards. To do so we need only compare our estimate(s) of the cost of meeting standards to our estimate of regular revenue per student. The results are presented in the row of *Table 5* labeled "2018-19 Shortfall per student." The row labeled "2018-19 Total Shortfall" multiplies the shortfall per student by enrollment to estimate the (lower bound of the) increase in funding needed to achieve adequacy in each scenario.

*Table 5*: Estimates of the Capital Funding Shortfall

| | Cost Estimate | | |
|---|---|---|---|
| **Item** | **Conservative** | **Central** | **Liberal** |
| Annualized Cost per student | 1,827.47 | 2,494.83 | 3,192.07 |
| 2018-19 Regular revenue per student | 1,287.52 | 1,287.52 | 1,287.52 |
| 2018-19 Shortfall per student | 539.95 | 1,207.31 | 1,904.55 |
| 2018-19 Total Shortfall (Billions) | 1.51 | 3.37 | 5.31 |
| 2018-19 Eroding Funding (PECO & CO&DS, Billions) | 0.34 | 0.34 | 0.34 |
| 2018-19 Total Additional Sustainable Funding (Billions) | 1.85 | 3.71 | 5.65 |
| 2023-24 Total Additional Sustainable Funding (Billions) | 2.23 | 4.54 | 6.94 |

Even based on the conservative cost per student of $1,827, regular revenue was $540 short per student, or $1.5 billion in total. On the other end of the spectrum, based on our liberal cost per student estimate of $3,192, regular revenue per student is $1,905 short per student, or $5.3 billion in total. However, the conservative estimate is almost certainly much too conservative, and while one could make reasonable arguments for our liberal estimate, it would take access to more information to make a strong case in its favor. Using the central cost estimate of $2,495 per student, regular revenue was $1,207 short per student, or $3.4 billion in total.

- *Regularly recurring capital revenue was $1,207 per student short of the level needed to sustain capital standards in 2018-19, or $3.4 billion in total.*

Redressing that shortfall alone, however, will not sustain adequate capital funding because the revenue streams that flow into the CO&DS and PECO trust funds will likely continue to erode. To make adequate capital funding sustainable, in addition to adding $3.4 billion in sustainably growing funding, the eroding portion of funding flowing from PECO and CO&DS, $0.3 billion,

must also be replaced by funding from a source resistant to erosion. This brings the total additional sustainable funding needed to $3.7 billion as of 2018-19. The $0.3 billion in freed up PECO and CO&DS funding could then be applied to the capital needs of state institutions of higher education, transportation, or other needs.

Of course, conditions change over time, and the required increase in sustainable funding allocated to capital funding will grow over time. The U.S. Bureau of Economic Analysis' price indices for private fixed investment and state and local government consumption and investment grew at average annual rates of 3 and 3.5% respectively from the second quarter of 2018 through the second quarter of 2022.[36] Moreover, inflation is expected to remain elevated through 2022 and 2023, pulling the average up.[37] So, adjusting for inflation alone, this estimate must be increased approximately 3.5% per year from 2018-19 to 2023-24. Adding to this our estimate of growth rate of the real capital stock due to increases in enrollment and real income, 1.7%, total funding must grow approximately 5.2% per year from 2018-19 to 2023-24, bringing the need for additional sustainable funding to $4.5 billion.

- *To sustain adequate capital funding, the revenue streams supporting CO&DS and PECO must be replaced with revenue from a base that is unlikely to erode, meaning an additional $0.3 billion in such funding was needed in 2018-19, bringing the total to $3.7 billion. By 2023-24, this will have grown to $4.5 billion.*

### 8.2 Adequacy Relative to Florida's Past

Figure 14 near the end of section 6 summarized capital revenues and expenditures from 2000-01 through 2018-19. It appears again below as Figure 16 for ease of reference. As we observed in section 6, capital expenditures per student were lower in 2018-19 at $1,807 than they were in 2000-01 at $1,821. The shortfall is much larger if we make allowance for increases in prices and income. From 2000-01 through 2018-19, inflation alone would have called for an increase of 41%, while growth in real income per capita, if we assume demand for capital grows with income, would have added 21%. If we also account for the fact that capital prices grew 20% more than other prices, and assume the price elasticity of demand is -0.5, we need to add another 10%. Together, capital expenditures per student would have to have been $1,581, or 87%, higher in 2018-19 to compensate for price increases and adjust for income growth since 2000-01. Multiplying the shortfall per student by the number of students, this comes to $4.5 billion.

- *Capital expenditure per student in 2018-19 was slightly less than in 2000-01 before adjusting for prices and income. After such adjustments, capital expenditure per student fell by $1,581 from 2000-01 to 2018-19.*

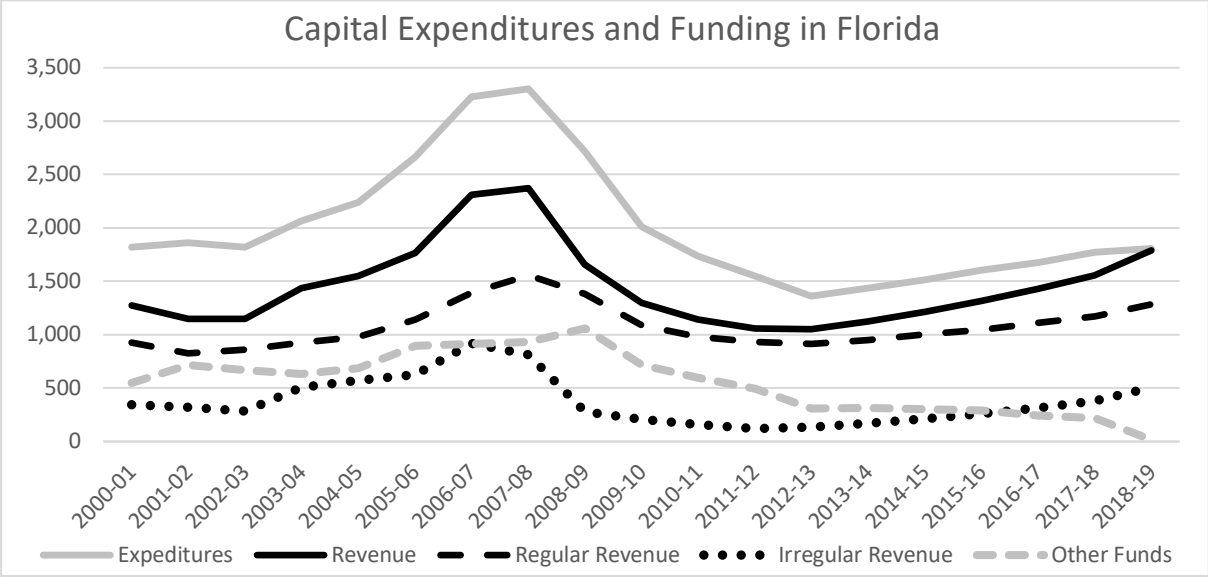
Concluding that there was a shortfall of $4.5 billion in expenditure relative to the choices of the early 2000s, however, does not by itself imply revenue was too low to sustain adequate capital. This is because some portion of expenditure is debt financed. Indeed, given the size and discontinuous nature of major capital projects, debt finance is a crucial tool in matching annual

[36] The price indices are available at https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=2#reqid=19&step=2&isuri=1&1921=survey

[37] See the Federal Reserve Open Market Committee's March 2022 projections available at https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20220316.pdf

funding flows to capital needs. Moreover, the debt financed portion of expenditures will likely fluctuate over time. So, we must account for how much of the annual expenditure can be sustained by new debt issue to determine if revenue itself is sufficient to sustain capital expenditures that are comparable to the past.

*Figure 16*




We showed in section 4 that the ratio of the annual increase in debt to annual capital expenditure in a sustainable budget will not exceed 12.5% unless a district permanently maintains a ratio of debt to equity greater than one and makes essentially no use of short-term leasing, and if we assume the smallest plausible values for maintenance costs, depreciation rates, and the interest rate and the largest plausible values for the growth rates of desired capital per student and the student population. Under more reasonable conditions, the ratio will not exceed 10%, and might well be far lower. Thus, at most 10% of the $3,388 total for 2018-19 could sustainably be covered through new debt. Subtracting 10% leaves $3,049 that must be covered from regular and irregular revenue to sustain the level of capital expenditure from the early 2000s.

How much should we expect to cover from irregular revenue? As of 2018-19 irregular revenue was $505 per student. It increased at an average annual rate of 2.1% since 2000-01, though of course it trended up faster as it recovered from bottoming out in 2011-12. It seems unreasonable to expect a large increase in irregular revenues from sources such as impact fees, local option taxes, voter approved additional millage, and federal grants, when such sources are apparently already utilized at about the same rate per student as they have been for the last two decades, judging from Figure 17. Moreover, they are subject to forces outside the control of the school board and legislature. Thus, school districts cannot count on sustaining irregular revenue at higher levels, because they are not under their control. Subtracting $505 from $3,049, $2,544 in regular revenue was needed in 2018-19 to maintain adequacy relative to the early 2000s, $1,257 higher than its 2018-19 value of $1,288 (discrepancy due to rounding). Multiplied by the number of students, this comes to $3.6 billion.

We should keep in mind that 2000-01 capital spending may have been slightly above normal due to the near-term impacts of dealing with the baby boom echo. Balanced against this, we should also keep in mind that Floridian's passed the CRSA in 2002, with 52.4% in favor and

47.6% opposed. Thus, the capital stock in 2002 was considered inadequate by a majority of Floridians, and $3.6 billion may be an underestimate of the regular revenue shortfall in this sense.

We should also keep in mind that the higher level of spending in the mid 2000's due to the CRSA related expansion and the revenue flowing from the housing boom, coupled with the flattening of enrollment growth after the peak impact of the baby boom echo, may have led to temporary expansion ahead of what would have occurred if enrollment growth had been more even. Since capital is durable, this could allow a few years of lower spending in the 2010s without reducing annual capital services below the level desired. Even so, sustained funding per student well below the benchmark, as we see over the 2010s, implies a substantial decline in the adequacy of capital expenditures relative to the values of Floridians from the early 2000s.

In addition to the level of regular revenue in 2018-19 being inadequate compared to 2000-01, it must also grow around 5.2% annually from 2018-19 through 2023-24 to maintain the current level of relative adequacy, as explained above. We will assume irregular revenues will keep pace with inflation and real income growth, as the bulk of their underlying tax bases should do so. Applying 5.2% annual growth to the $3.6 billion estimated annual shortfall in 2018-19 brings the total to approximately $4.4 billion for 2023-2024. This, however, is an underestimate, since the PECO and CO&DS revenue streams are likely to continue to erode.

- *In 2018-19 regular capital revenue per student was $1,257 short of maintaining adequacy relative to Florida's commitment of resources for capital purposes in 2000-01 after adjustment for increases in prices and real income, or $3.6 billion total. This will grow to approximately $4.4 billion by 2023-24.*

### 8.3 Redressing Revenue Inadequacy

Above we estimated the shortfall of regular capital revenue relative to the cost of sustainably meeting the state's minimum standards will reach approximately $4.5 billion in 2022-23. Similarly, we estimated the shortfall of capital revenue relative to the cost of the level of capital provided in the early 2000s, after adjusting for changes in income and prices, will reach approximately $4.4 billion by 2023-24. The close agreement between the two estimates is remarkable, suggesting there has been a major decline in the adequacy of capital funding over the last two decades. What should be done about the shortfall? That is a question for the legislature, but we can help make discussion among those concerned with school funding more productive by considering the possibilities.

At one end of the spectrum is to conclude current capital standards are too high and that Floridians in the early 2000s placed too high a value on investing in education. In this case, the appropriate response is to reduce capital standards to allow schools to meet them with existing revenues. This would mean things like weakening applicable building codes, reducing space per student, and reducing security and hardening requirements to a level compatible with the current funding stream. At the other end of the spectrum of choices lies raising regular revenue for capital purposes enough to make up the difference. Of course, it is possible to meet in the middle, increasing regular revenue and at the same time reducing standards.

If the gap is closed by increasing regular revenue, an important question is how to raise it? It is possible to reallocate revenue from other uses. However, there is no reason to think it would be easy to find $4.5 billion in extra revenue in the 2023-24 budget by eliminating existing

expenditures. It is also possible to raise additional revenue by creating new revenue sources or by raising tax rates on one or more existing tax bases.

We will consider in more detail what it would take to raise this revenue by increasing the rate on a single broad tax base. The dominant revenue sources in state and local education are state general revenue (the largest source of which is the sales tax) and the property tax. These are also the only existing revenue streams that are both broad enough to support such a large increase in revenue with only a modest rate increase and likely to grow rapidly enough to maintain adequacy. Of the two, it would be more efficient to rely on the sales tax for two reasons.

First, the effective property tax rate is too high relative to the sales tax rate. This issue is discussed in section 3 of the 2012 LeRoy Collins Institute report *Tougher Choices Shaping Florida's Future*.[38] Though the report is a decade old, the core issue has not changed. Considering county, school, and municipal property taxes, the effective property tax rate on the annual flow of services from structures is around four times as high as the sales tax rate. This inefficiently distorts choices away from building larger or higher quality structures in favor of other types of consumption. As a result, the damage done to the economy is higher than it would be if we raised the same amount of revenue relying more on the sales tax and less on the property tax.

Second, as discussed in section 6 of *Tougher Choices Shaping Florida's Future*, and as we will discuss more in following sections, the FEFP currently makes inefficient use of the property tax base due to the interaction of the relatively low level of state FEFP funding in the system and the 90% cap on required local effort (RLE). RLE is capped at 90% of a district's FEFP funding to ensure each district gains at least some state funding. As a result, the higher the reliance on local funds, the higher the number of districts in which required local effort is capped. Thus, the higher the reliance on state funding, the lower property tax rates are in the most property rich districts, and so the higher property tax rates are in the rest of the state.

- *Both the sales and property tax bases are broad enough that a modest increase in either tax rate could raise sufficient revenue to sustain adequate capital funding but increasing the sales tax rate would be more efficient.*

How large an increase in the sales tax rate would have been required to raise $3.7 billion in additional funding in 2018-19? Taxable sales from July 2018 through June 2019 were $459.7 billion.[39] Raising another $3.7 billion would thus require an increase in the sales tax rate from 6% to near 7%, as 3.7/459.7=0.008. One might object to this simple approximation on the grounds that the increase in the tax rate will reduce taxable sales. While true, the decrease will be small enough to make little difference. This is because since an increase in the sales tax rate from 6% to 7% represents a small change in after tax prices, the resulting change in taxable sales will be small, even if taxable sales are relatively responsive to changes in after tax prices. For example, suppose the elasticity of taxable sales with respect to tax inclusive prices is -2, meaning a 1% increase in the price of taxable goods and services versus other goods and services causes purchases of taxable goods and services to fall by 2%. In that case, a tax rate of 7% would still be more than sufficient. After tax prices rise 0.94%, as 1.07/1.06=1.0094, taxable sales would then fall about 1.9% and the

[38] Dave Denslow and Jim Dewey. 2014. *Tougher Choices Shaping Florida's Future*. LeRoy Collins Institute, Tallahassee, Florida. Available at https://coss.fsu.edu/collins/wp-content/uploads/sites/28/2020/11/Tougher-Choices-FINAL-2-20-14.pdf.

[39] Data on taxable sales and tax collections is available from the Florida Department of Revenue at https://floridarevenue.com/taxes/pages/colls_from_7_2003.aspx.

increase in revenue would be approximately (0.07×0.981-0.06)×$459.7 billion, or $4 billion, more than the 3.7 billion needed.

- *An increase in the sales tax rate from 6% to nearly 7% is sufficient to sustain adequate capital funding.*

It is worth noting again that an increase in the sales tax rate is not the only way to gather the revenue needed to sustain capital adequacy. Broadening the sales tax base, for example to currently exempt goods or services, would increase revenue without increasing the tax rate. As an example, the approximately $1 billion of revenue raised by the recent expansion of sales tax collections to remote sales, which was used to reduce other taxes, could instead have been used to cover about one quarter of this shortfall.[40] It might also be raised by reallocating revenue from other uses. For example, the governor vetoed $3.1 billion in spending from a balanced 2022-23 budget.[41] That plus the revenue from the expansion of the sales tax base to include remote sales would essentially cover the shortfall in regular capital revenue. Multiple revenue sources might of course be combined. The analysis above simply demonstrates the feasibility of raising the necessary revenue in a sustainable way through a modest increase in the sales tax rate.

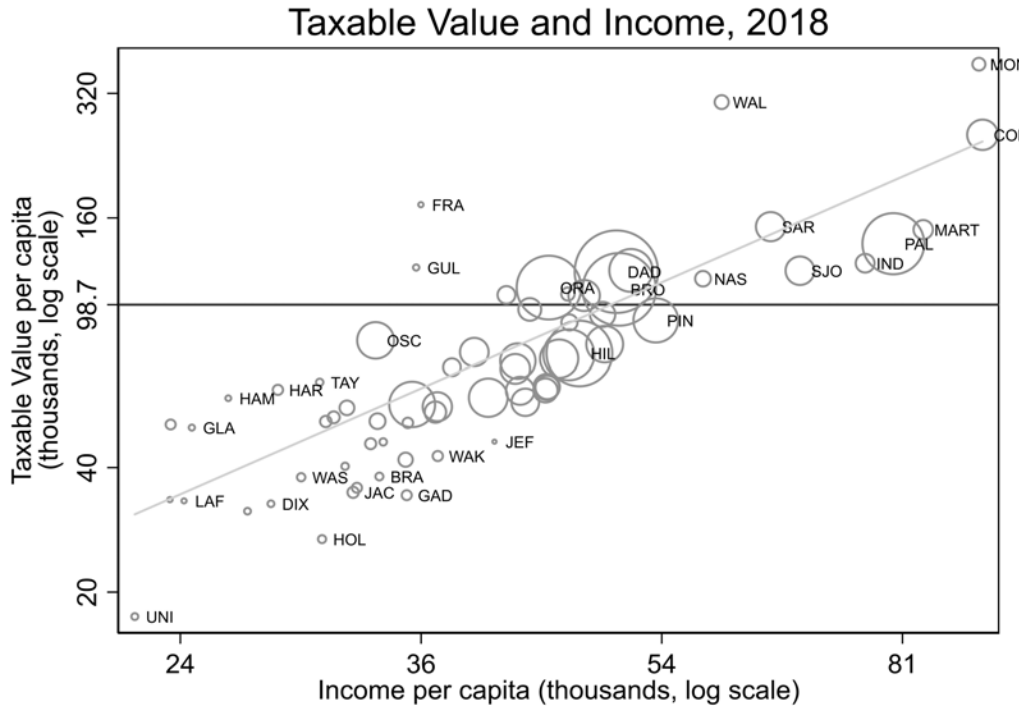
[40] Renzo Downey. April 20, 2021. "Gov. DeSantis signs online sales tax plan." *Florida Politics*. Accessed May 21, 2022 at https://floridapolitics.com/archives/421905-online-sales-tax-desantis/.
[41] Matt Dixon. June 2, 2022. "'Just the way it goes': DeSantis axes $3B from Legislature's budget in front of Republican leaders." Politico. Accessed June 20, 2022 at https://www.politico.com/news/2022/06/02/just-the-way-it-goes-desantis-axes-3b-from-legislatures-budget-in-front-of-republican-leaders-00036893.

# 9. Equity

The lion's share of capital funding comes from local property tax revenue, which equals the product of the discretionary local capital millage rate and taxable value. Most districts set the discretionary capital millage rate at the highest allowable value. In 2018, 56 of 67 districts, comprising 93.6% of students, set millage at the 1.5 mill cap, while only 4 districts comprising 0.6% of students set the millage rate below 1.25. We focus on variations in ***potential*** annual local capital support; what would accrue to the district if the millage rate equaled the cap. We adopt this approach because it simplifies the analysis and because there is no clear alternative that is better. Districts that set millage rates below the cap tend to have very high taxable value per student. These districts have the option to set a higher millage rate and receive the potential revenue but choose not to. Thus, focusing on potential revenue understates the advantage these districts have over other districts.

One might surmise students in higher income districts have proportionately more capital available because: 1) local taxable value per capita (TVPC) is positively associated with local per capita income (PCI), 2) capital support is not equalized, and 3) local capital funding is the lion's share of capital funding. This, however, need not be true. For example, perhaps there is more taxable value where tourism is higher, as hotels and restaurants are needed for tourists, but the jobs associated with tourism do not pay well, so income per capita is lower. It is an empirical question, addressed in part in Figure 17.

*Figure 17*




1) Population weighted mean taxable value per capita is 98.7 thousand. Population from the U.S. Census Bureau, https://www.census.gov/.
2) Marker size proportional to number of students.
3) Income per capita from the U.S. Bureau of Economic Analysis, https://www.bea.gov/.

Figure 17 shows that taxable value per capita is very uneven across districts. Collier, Franklin, Martin, Monroe, Sarasota, and Walton exceed the average by more than 50%, while 36 counties have less than 67% of the average. The standard deviation of taxable value per capita (population weighted) is 40.7 thousand dollars, over 40% of the average; it is typical to live in a county more than 40% from average taxable value per capita. Moreover, the regression line in the figure shows that, all else equal, a student in a district where income is 1% higher has access to 1.45% more capital support. Not only does capital support appear non-uniform, and not only is capital support higher for students in districts with higher incomes, but it is so by a factor of proportionality exceeding one.

- *Capital support is uneven across districts. On average an increase of 1% in per capita income is associated with 1.45% higher capital funding.*

While Figure 17 suggests capital support is not only inequitable, but inequitable in a strong and systematic way, it does not tell the whole story, as surely all else is not equal. Two factors seem important. First, capital cost is not the same everywhere, and we might expect that on average taxable value per capita will be higher where the cost of capital is higher. Second, the ratio of students to population varies across districts. A district might be capital rich not because it has a lot of taxable value per capita, but because it has few students per capita.

To account for the relative price of a standard unit of capital, we need a district level capital cost index. To the best of our knowledge, one does not exist. Therefore, we construct a rough and ready version as follows. First, we calculate the three-year average of the Florida Price Level Index (FPLI) for 2016-2018.[42] The FPLI is used in the FEFP calculation to represent the relative cost of labor across school districts. Presumably, where labor is more expensive, it will cost more to build and maintain structures. Second, we obtain a land cost index based on 2005 values.[43] Buildings cost more where land costs more. Third, we assume readily transportable items, such as building materials, school busses, parts, and cleaning products, cost the same everywhere, as suggested by the law of one price. Both the FPLI and the land cost index are scaled to have a student weighted average of 1. To the extent a district is more expensive than average, the index values exceed 1.

We calculate a capital cost index (CCI) by placing a weight of 0.3 on transportables, 0.5 on labor, and 0.2 on land. There is no reason to think the resulting index is highly accurate. It is intended only to point us in the right direction by accounting reasonably for the right things. Constructing an index for use in actually allocating funding would require detailed study.

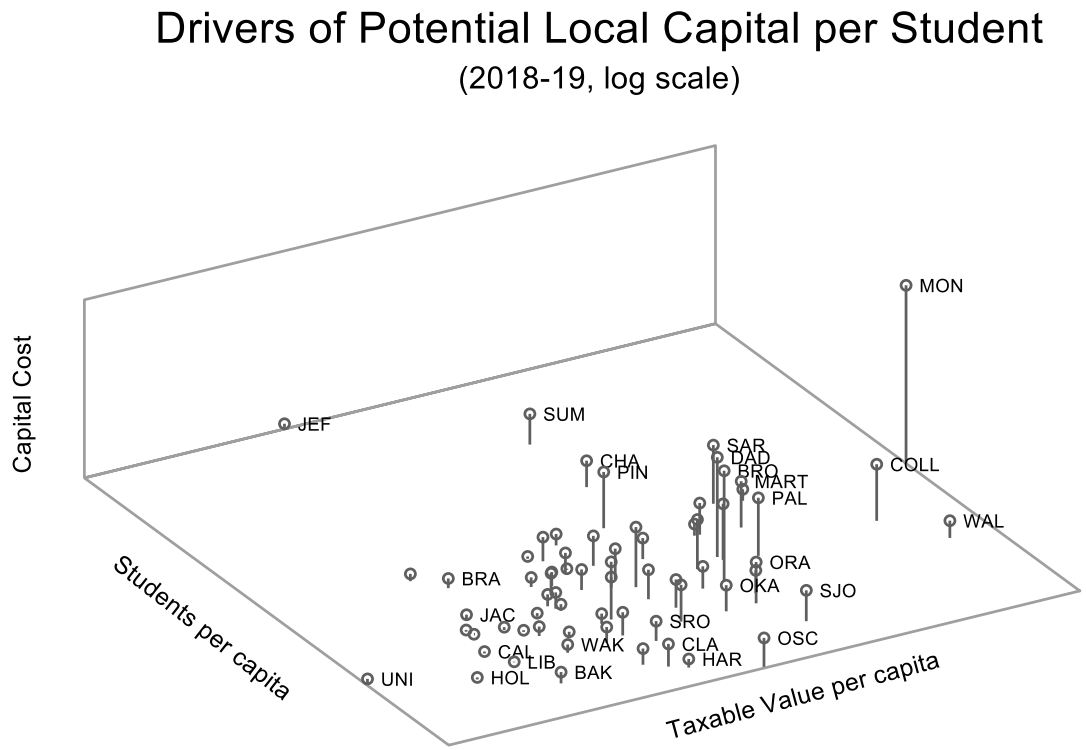
We define potential local capital per student, *PLCPS*, as the maximum discretionary millage rate multiplied by ***real*** taxable value per student, *RTVPS*. Since all districts face the same cap, variation in *PLCPS* at a point in time depends entirely on variation in *RTVPS*. *RTVPS* in turn is taxable value per capita divided by both students per capita (*SPC*) and the CCI. Figure 18 shows the variation in all three factors across the state. The figure makes it clear that all three factors vary considerably. Thus, the difference between capital funding and capital resources may be large.

[42] Jim Dewey, (2019), *2018 Florida Price Level Index*, available at https://floridapoly.edu/wp-content/uploads/2018fpli.pdf.

[43] Retrieved from the author's archives from earlier work constructing land cost indices for Florida's counties, with 2005 being the last year the index was available.

- *Potential local capital per student equals taxable value per capita divided by students per capita and the relative price of capital. All three factors vary considerably across Florida. As a result, the difference between capital funding and capital resources may be large.*

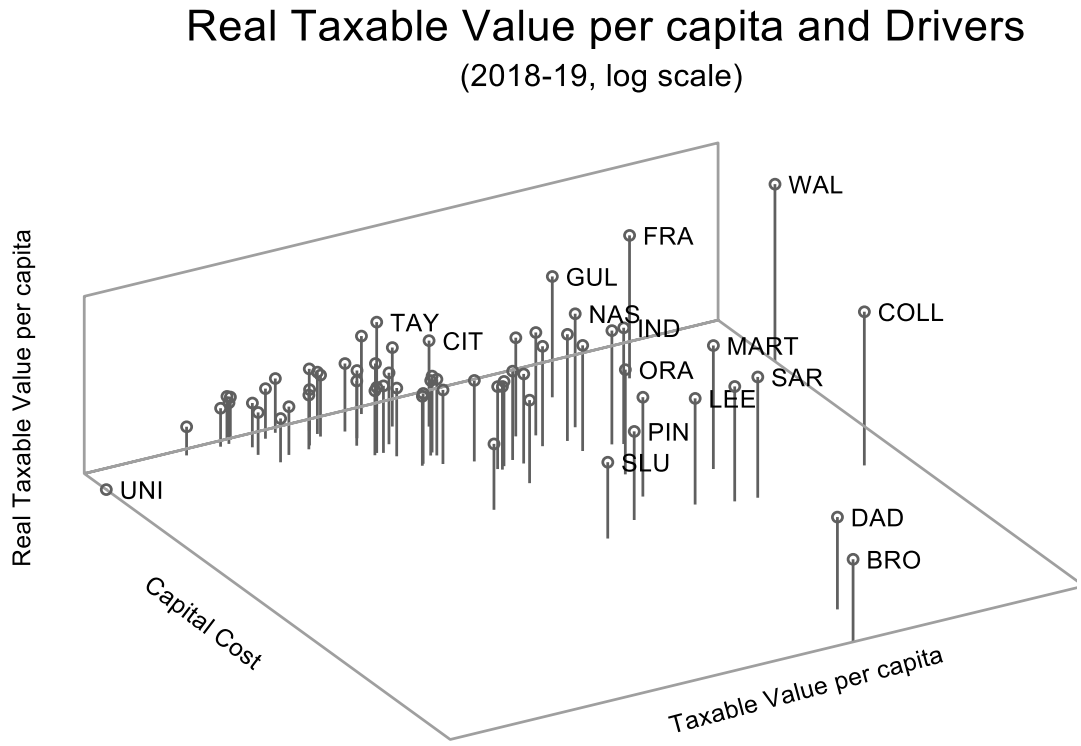
*Figure 18*




1) School taxable value and student count from the 2018-19 FEFP Final Calculation, http://www.fldoe.org/core/fileparse.php/7507/urlt/1819FEFPFinalCalc.pdf.
2) Population from the U.S. Census Bureau, https://www.census.gov/.
3) Capital cost index calculated as described in the text.

Figure 19 shows the relationship between real taxable value per capita, taxable value per capita, and the capital cost index. Districts with the presence of sandy beaches that are tourist destinations tend to be among those with the highest taxable value per capita. In addition, districts with more taxable value per capita tend to have higher capital cost indices, though the relationship is far from one to one because other factors also drive capital costs. Equalizing for differences in taxable value without adjusting for differences in the cost of capital would, on average, represent an overadjustment, leading to inequality in the opposite direction.

*Figure 19*




Monroe is off the chart to the bottom right with a capital cost index of 182, taxable value per capita of $377 thousand, and real taxable value per capita of $206 thousand.

Figure 20 shows the distribution of real taxable value per capita, students per capita, and potential local capital per student across districts. One category of capital rich districts consists of those like Walton, with a typical ratio of students to population but lots of waterfront and a related increase in property values. Sandy beaches are gold mines for school capital. Sumter county does not have any sandy beaches, but it has another sort of gold mine—in the form of the retirees in the Villages. Retirees (and the businesses they frequent) own property and pay property taxes but do not send children to the local schools. Unsurprisingly, the most capital poor districts are rural or suburban communities that have little real taxable value per capita and lots of students per capita.

In addition, as we have seen, a small amount of state funding is devoted to capital support. In principle, the inequity in potential local capital support could be offset by state funding. However, that cannot happen in practice for three reasons. First, as we saw in Figure 12, there simply is not that much state funding. Second, CO&DS funding is allocated based on FTE counts (with minor year to year fluctuations due to complexities of bonding). Third, most PECO funding is used for charter schools and allocated according to the number of charter school students.

To get a sense of the distribution of capital resources, we define Potential Capital per student (*PCPS*) as the sum of potential local capital per student, CO&DS funds per student, PECO funds per student, and what we called the regular discretionary legislative allocation (RDLA) per student, all divided by the CCI. Recall that small amount of PECO funds for PK-12 that are not allocated to charters are allocated at the discretion of the legislature, and so the actual allocation

can vary from year to year. To get a sense of the typical amount, we simply allocate our estimate of sustainable funds for 2018-19 proportional to the number of students in the district.

*Figure 20*

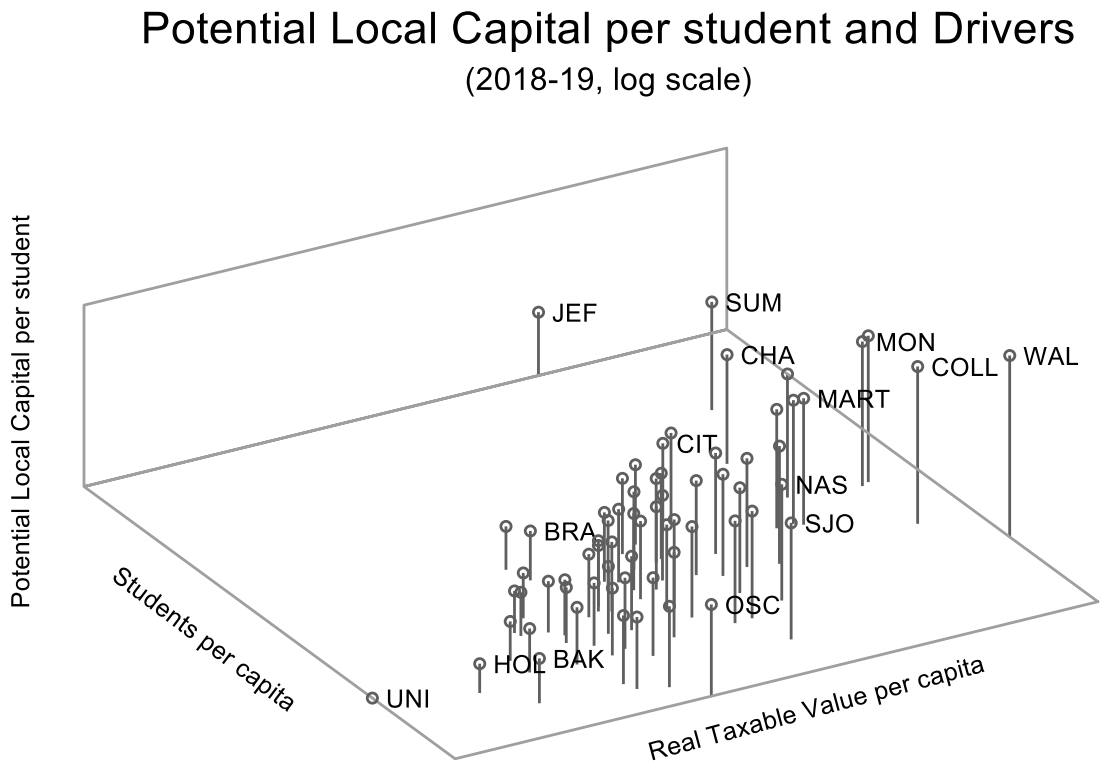
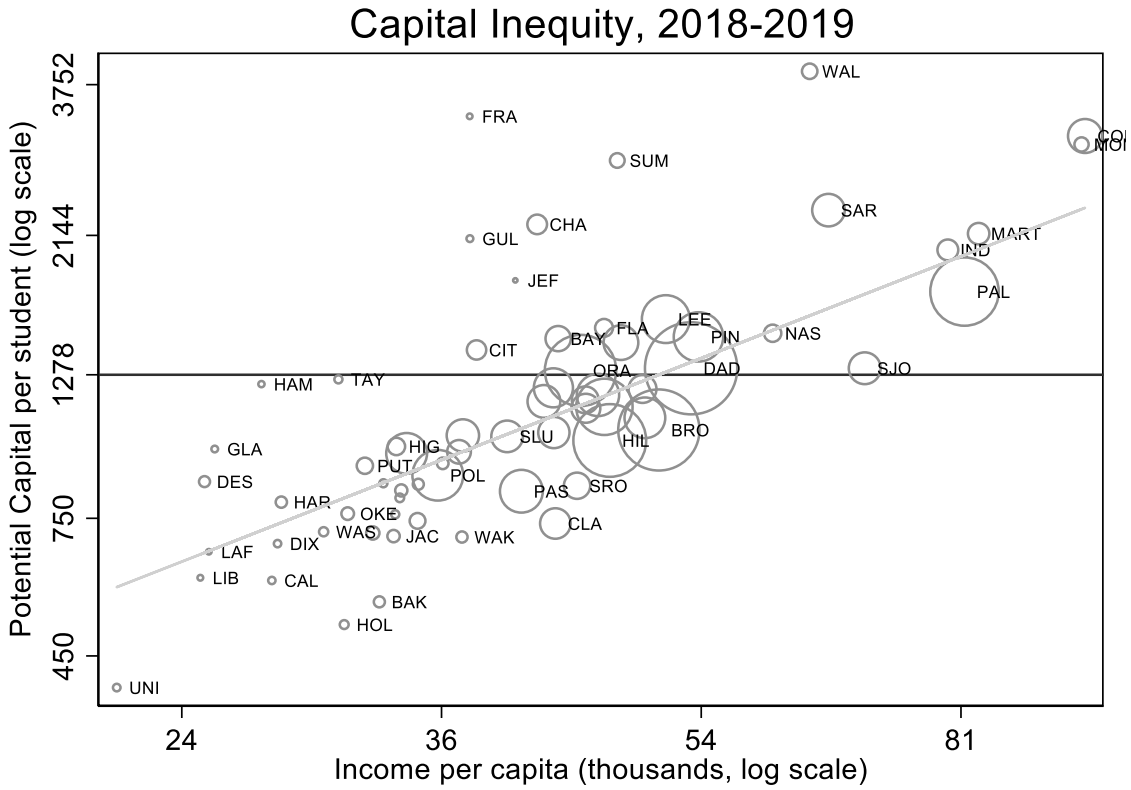



Figure 21 shows the distribution of PCPS across districts and its relationship to per capita income. Mean annual capital support is $1,278. The student weighted standard deviation is 449, or 35% of the mean, indicating considerable inequity. Even ignoring the most extreme districts, students in Charlotte, Gulf, Indian River, Martin, and Sarasota sustainably receive roughly three times the annual capital support received by students in Clay, Dixie, Hardee, Jackson, Lafayette, Okeechobee, Pasco, and Wakulla.

Moreover, the inequity relates strongly to income. From a student weighted perspective, rather than a district weighted perspective, students in a district with double the per capita income receive 93% more annual capital services after adjusting for differences in capital cost. Despite the constitutional requirement for uniformity, districts where incomes are higher receive higher capital support, nearly proportionately so.

In addition to inequity associated with per capita income variation, capital support varies considerably at any level of per capita income. This is largely related to two factors discussed above, students per capita and the cost of capital. For example, we see from the figure that Broward has a per capita income similar to Sumter, but far less capital support per student. That is largely because Sumter faces a lower cost of capital per unit and has fewer students per capita.

*Figure 21*




1) Student weighted mean PCPS is 1,278.
2) Marker size proportional to number of students and regression results are student weighted.
3) For purposes of this analysis, since the entire Jefferson County district was operated by a charter management company in 2018-2019, we assume it receives the full potential local funding and a pro rata share of CO&DS and non-charter PECO funding, but no additional charter PECO funding.

Careful consideration of the previous four figures provides a very good sense of the way capital support per student varies across Florida's school districts. Students in small, rural, inland districts receive little capital support. Students in medium sized coastal districts with attractive oceanfront receive lots of capital support. Students in large districts tend to receive capital support near the average or slightly below it even if they are blessed with beautiful sandy beaches. This is because capital costs are higher where population is higher, outweighing the taxable value associated with the limited coastal property since it is spread over many students.

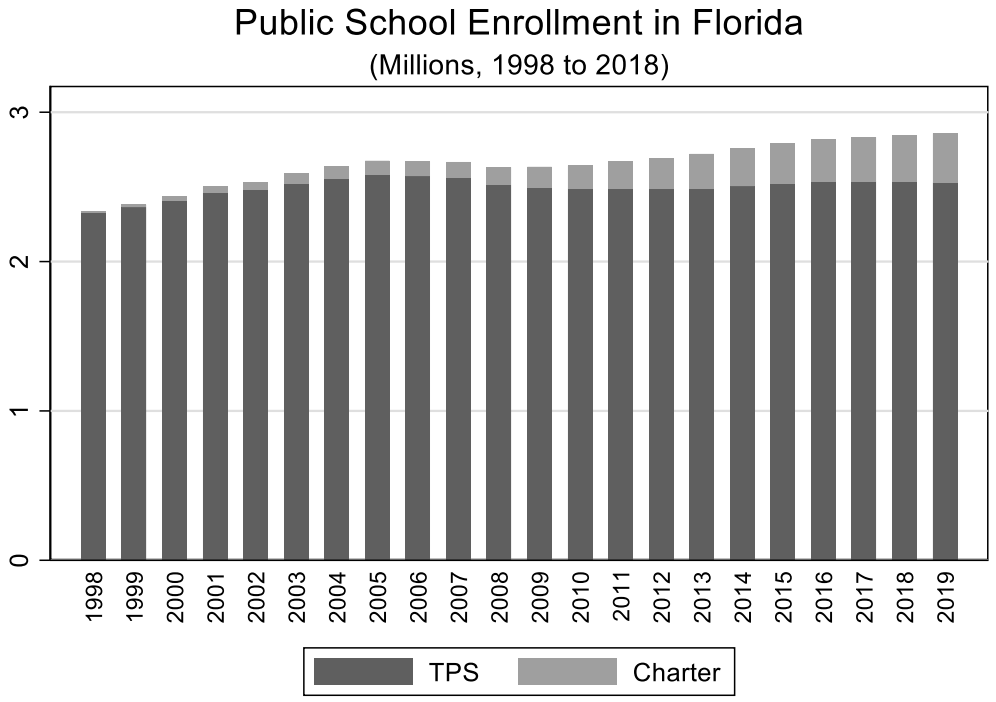
- *Despite the uniformity requirement of Florida's constitution, there is considerable inequity in capital support across school districts, and the inequity is nearly proportional to per capita income on average. To redress this inequity, capital funding must be adjusted for differences in the local property tax base per student and the cost of capital.*

# 10. Charter Schools

Charter schools are public schools that operate more independently of the local school district than traditional public schools (TPSs). They may be operated by the local district, by for-profit or not-for-profit charter school management companies that manage many such schools, or as independent one-off operations seeking to fill a niche in their communities.

The importance of charter schools in Florida has grown rapidly over the past two decades, as shown in Figure 22. In Fall of 1998, charter students enrolled less than 0.5% of Florida's public school students, compared to over 11% in Fall 2018. TPS enrollment, by contrast, has been flat since 2008. Capital funding works differently for charters than for TPSs and the impact of this difference has grown with growth in charter enrollment.

*Figure 22*



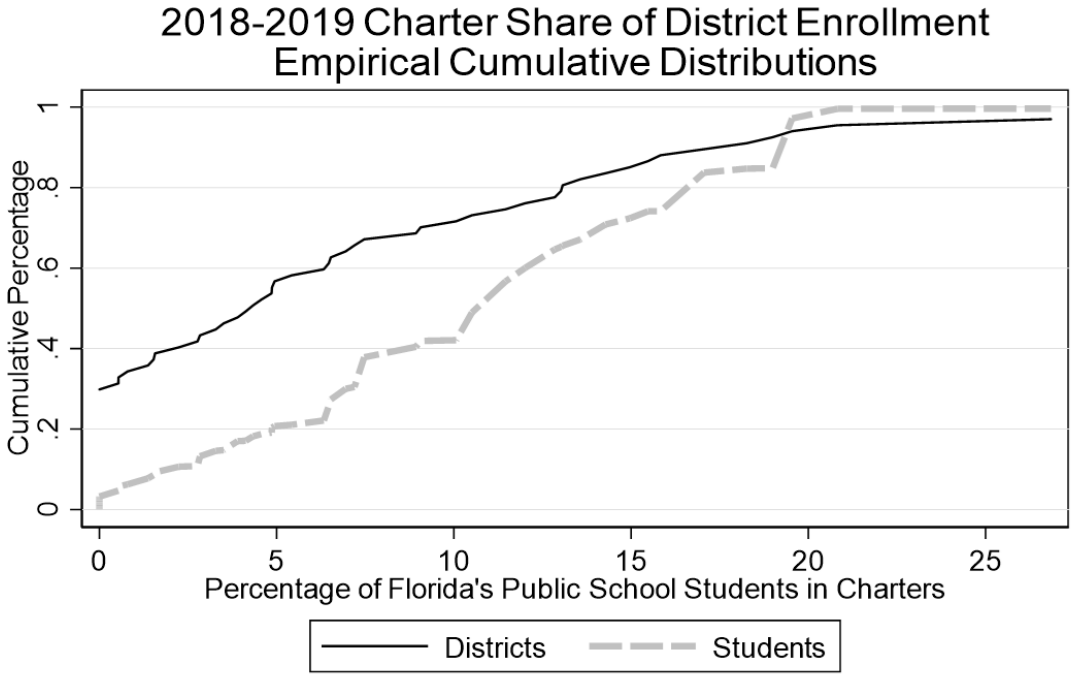

Data from the National Center for Education Statistics Common Core of Data at https://nces.ed.gov/ccd/. Excludes alternative education enrollment.

- *Charter school enrollment grew from a negligible share of public school enrollment in 1998-99 to 11% in 2018-19, while TPS enrollment has been flat since 2008.*

Charter school enrollment is not uniform across Florida. Figure 23 shows the empirical cumulative distribution of the charter school share of enrollment, both from the viewpoint of districts and from that of students. Some districts have no charter enrollment, some have little, and some have much more than average. Twenty of 67 districts have no charters, but only 0.12% of Florida's students are in those districts. Thirty-six percent of students in Sumter and 100% of

students in Jefferson are in charter schools, but only 0.03% of Florida's students are in these two districts. We will see below that this has implications for capital equity.

*Figure 23*




Data from the National Center for Education Statistics Common Core of Data at https://nces.ed.gov/ccd/. Excludes alternative education enrollment.

- *Charter school enrollment shares are very uneven across the districts.*

### 10.1 Common Concerns about Charter Schools

Because they operate outside many constraints faced by TPSs but receive public funding, charter schools are controversial. One need look no further than the National Education Association (NEA) website to see this. It states that the NEA "is committed to standing with parents, educators, and communities to support charters driving creative solutions that nurture student needs and are committed to the long-term health of their communities." Yet, it also lists numerous concerns with their operation, including, for example, draining needed funding from TPSs, waste of public resources, or outright fraud and theft.[44]

There are plausible reasons for such concern. If there were indeed substantial underlying problems, the issues associated with charter capital funding, our focus in this report, might be so trivial in comparison as not to merit attention. Therefore, before detailing the issues with charter school capital finance, we first discuss charter schools and charter school finance in Florida in light of these concerns. We consider six such concerns in this subsection: 1) academic performance, 2) accountability, 3) disruption due to charter closures, 4) academic, economic, and racial

[44] From the NEA website at https://www.nea.org/student-success/smart-just-policies/funding-public-schools/charter-school-accountability, accessed June 18, 2021.

segregation, 5) draining resources from TPSs, and 6) waste and fraud.[45] At least in the case of Florida, there is little evidence that these concerns, however reasonable in the abstract, are associated with real, sizeable, systemic problems in practice. However, charter school capital finance in Florida is a clear and issue.

Most of the content of this subsection is simply a high-level synopsis of information from two sources. The first is "Charter Schools: A Survey of Research on Their Characteristics and Effectiveness" by Epple, Romano, and Zimmer.[46] The second, more specific to Florida, is the LeRoy Collins Institute Report "Florida Charter Schools: Not as Good, or as Bad, as Advertised".[47] The charter schools section of the Florida Department of Education website is also a useful source of information. All three are recommended to readers interested in more detail.

Academic Performance

Many studies compare the performance of charter schools to the performance of TPSs, particularly as measured by standardized tests. Here we focus on regular brick and mortar charter schools, and on the large volume of evidence summarized in "Charter Schools: A Survey of Research on Their Characteristics and Effectiveness". In one sense, the strongest results come from studies of oversubscribed charters, where openings are filled by lottery. These studies are strong because the lottery produces randomized assignment from which to judge the impact of charters. The results of such studies are clear—students attending charter schools perform better. In another sense, those are the weakest studies, because they are not generalizable. Why? It stands to reason that the charters that tend to be oversubscribed are the ones that tend to perform best, which is why they are oversubscribed. What about all the other charters?

Studies that are representative of the population of charter schools are weaker, in that they do not correspond to randomized trials, but stronger in that their results are generalizable. Such studies tend to find mixed results. Sometimes there are positive effects that are statistically significant. Sometimes there are small positive or negative effects that are statistically insignificant. There are rarely negative effects that are sizeable and statistically significant. Taken as a whole, regular brick and mortar charter schools may perform very slightly better than TPSs on average, and at the least do not perform systematically worse. This is true for the population they now serve, who have selected to attend them. It does not necessarily imply students currently in TPSs would do better in charters.

[45] These concerns are taken primarily from the NEA website page on Charter School Accountability at https://www.nea.org/student-success/smart-just-policies/funding-public-schools/charter-school-accountability, "Charter Schools: A Survey of Research on Their Characteristics and Effectiveness," or "Florida Charter Schools: Not as Good, or as Bad, as Advertised."

[46] Epple, Romano, and Zimmer. (2016) "Chapter 3 - Charter Schools: A Survey of Research on Their Characteristics and Effectiveness" in *Handbook of the Economics of Education*, Elsevier, Volume 5, Editors: Hanushek, Machin, and Woessmann. https://doi.org/10.1016/B978-0-444-63459-7.00003-8.

[47] Weissert, Uttermark, Artiles and Mackie, (2020), "Florida Charter Schools: Not as Good, or as Bad, as Advertised" available at https://coss.fsu.edu/collins/wp-content/uploads/sites/28/2020/11/Charter_Schools_Report_2020_WEB.pdf. The charter schools section of the Florida Department of Education website, as of June 17, 2021, was at http://www.fldoe.org/schools/school-choice/charter-schools/.

- *Florida's regular brick and mortar charter schools may perform slightly better than TPSs on average and do not perform systematically worse. This need not imply students currently in TPSs would do better in charters.*

Accountability

Charter schools operate under a revokable charter with more independence in their operations than do TPSs, ostensibly to foster innovation or competition with TPSs. That does not mean they are unaccountable to the state and the school district—as public schools they are. Their students must pass the same standardized tests as TPS students. Charter schools are required to undergo an independent audit annually to ensure they are financially sustainable.[48] They must also submit monthly financial statements to their local district.[49] Their charter may be revoked if they perform poorly on standardized tests or show signs of financial troubles.

Charters are not assigned students according to geography. They must attract students, lest they be forced to close for lack of funding. The evidence summarized in "Charter Schools: A Survey of Research on Their Characteristics and Effectiveness" suggests that charter schools that are older perform better, likely in part because the ones that perform poorly close their doors for lack of attendees and therefore lack of funding. This can be a strong form of accountability, accountability to market forces, and one to which TPSs are not subject, at least in the same way.

- *Florida's charters are held accountable through testing standards, financial reporting, and the threat of closure if they do not perform well enough to attract and retain students.*

Disruption due to school closures

Any system that tries to harness market-like forces to provide incentives and accountability for performance, innovation, or variety of service necessarily entails risk of exit—instability is inevitable by design. This is arguably the most appealing feature of charter schools—if their customers are not happy, the school will fail. But failures will create a burden associated with instability when students must find a new school due to closure.

Presumably, the burden of closures depends on when they occur. If they occur during, or near, summer or winter break, they will be less disruptive. We estimate only 17% of charter school closures in Florida occur between September 8th and December 18th or between January 8th and May 24th. If we weigh by the number of students involved, it falls to 15%.[50] Thus, most students impacted by closures experience the closure at the least disruptive times—during or very near summer and winter break.

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[48] 2019 Florida Statute 218.39, http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=0200-0299/0218/Sections/0218.39.html. The Florida Attorney General's summary of the audits for the 2017-18 fiscal year is available here: https://flauditor.gov/pages/pdf_files/2020-004.pdf.

[49] 2019 Florida Statute 1002.33, http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=1000-1099/1002/Sections/1002.33.html.

[50] Data on charter closures in Florida from http://app4.fldoe.org/CSA/PostToWeb/ManageSearch.aspx as accessed June 17, 2020. We augment this with data from the National Center for Education Statistics Common Core of Data at https://nces.ed.gov/ccd/. Schools that are alternative education programs, for example those associated with Law Enforcement agencies, are not included.

- *While charter closures can be disruptive, most charter school closures in Florida occur on or very near summer and winter break, minimizing the disruption.*

Of course, closures might be disruptive or disorderly in other ways. To shed light on this, we conducted a google search for news stories on the fifty-seven Florida charter schools that closed during the 2016 and 2017 calendar years.

Little or no news coverage was found in many cases. For example, Four Corners Charter High School in Osceola County closed in 2016 but the only news story to mention it merely mentioned that it had received an F grade for 2016-2017; we found no coverage of its closure.[51] In the case of the St. Paul School of Excellence in St. John's County, the only news coverage of its closure came over two years later in a story about the troubles another charter school faced.[52] Typical are stories merely detailing the fact that a school is likely to be, will be, or has been closed, with limited additional information.[53]

Some stories suggest charter closures are not always very disruptive. When Duval County's Valor and Virtue charter schools closed in December 2016, the article claimed parents and staff were "surprised and saddened" but also explained that the schools and school board were working together to transition students to new schools over winter break. The only student quoted extensively seemed disappointed but also expressed the sentiment that some of his classmates would be happy to attend other schools.[54]

Other stories suggest school closures can be quite disruptive. For example, when Goodwill LIFE Academy, a school serving special needs students in Lee County, closed in 2017, parents questioned the lack of notice for the closure and looked for ways to keep the school open.[55] Some parents started a GoFundMe fundraising effort to keep the school open.[56]

Closures are sometimes due to problems such as neglect or fraud that shock the conscience. For example, the head of Broward County's Paramount Charter School was accused of misappropriation of funds and the school was low performing and in deplorable conditions.[57]

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[51] Annie Martin. July 15, 2016. "Central Florida schools face changes after getting Fs." *Orlando Sentinel*. https://www.orlandosentinel.com/news/education/os-failing-schools-orange-seminole-20160715-story.html

[52] Travis Gibson. January 12, 2019. "We will get this turned around." *The St. Augustine Record*. https://www.staugustine.com/news/20190112/local-charter-school-facing-financial-troubles-placed-on-corrective-action-plan-by-school-district

[53] News4Jax Staff, July 26, 2017, "Clay County charter school set to close after 2 Fs," *News4Jax.com* at https://www.news4jax.com/education/report-clay-county-charter-school-set-to-close-after-2-fs and Palm Beach Post Staff, August 14, 2017, "Few problems reported as classes begin for Palm Beach County public schools," *Palm Beach Post* at http://extracredit.blog.palmbeachpost.com/2017/08/14/few-problems-reported-as-classes-begin-for-palm-beach-county-public-schools/.

[54] Denise Smith Amos, December 1, 2016, "Valor and Virtue charter schools to close later this month," *The Florida Times Union*, at https://www.jacksonville.com/news/2016-12-01/valor-and-virtue-charter-schools-close-later-month.

[55] Pamela McCabe, May 22, 2017, "Goodwill LIFE Academy will close, board pulls its charter," *The News-Press*, at https://www.news-press.com/story/news/education/2017/05/22/future-lee-countys-goodwill-life-academy-decided-today/337071001/

[56] Matthew Smith an Julie Glenn, May 31, 2017, "Why Goodwill LIFE Academy Closed—And What's Next for Students," WGCU.org, at https://news.wgcu.org/post/why-goodwill-life-academy-closed-and-whats-next-students.

[57] Bob Normal, August 9, 2017, "Public charter school leaves trail of debt, allegations of misappropriation," Local10.com, https://www.local10.com/news/local-10-investigates/public-charter-school-leaves-trail-of-debt-

However, it is unclear how disruptive the closure itself was. Another charter company renovated the building and opened a new charter school in time for the next academic year.[58]

Lack of coverage does not necessarily indicate closures are not highly disruptive. Newsroom resources have declined dramatically in recent years and lack of coverage might just reflect that fact or editorial decisions.[59] Given that limitation, we can at least say that charter school collapses that garner press coverage indicating they were highly disruptive seem rare.

- *There are few press accounts of highly disruptive closures.*

Academic, economic, and racial segregation

Some critics of charters worry charters appear to perform successfully only because of cream skimming, meaning they take only the best performing or easiest to teach students, resulting in segregation of schools by academic ability. This would leave TPSs with a harder job and students in TPSs with a lower performing peer group. This misses the fact that studies of performance generally control for student characteristics, including performance prior to entering the charter school. However, some may be concerned about segregation by academic ability in its own right.

Florida's charters cannot admit whomever they want. They must accept all who apply, and if they are oversubscribed, openings for new students are filled by lottery. Therefore, there is no direct cream skimming. That need not mean there is no tendency for cream skimming through less direct means. It could be the case that higher performing students with more active and involved parents disproportionately choose charter schools. Yet charter schools often open near struggling TPSs, whether motivated by a desire to offer alternative programs to struggling students or because they view such locations as an opportunity to attract students and the resulting funding.

The extensive evidence summarized in "Charter Schools: A Survey of Research on Their Characteristics and Effectiveness" by Epple, Romano, and Zimmer, suggests there is little to no cream skimming on average, and that, moreover, the average student attracted by charter schools may have performed lower than the average student in the TPS they leave. Certainly, this varies from school to school and district to district—cream skimming occurs in some cases and the opposite occurs in others. However, TPSs are also far from identical to one another in terms of the composition of their student bodies as reflected by standardized tests.

Similar concerns are also raised about the potential of indirect sorting to increase economic or racial segregation. Like cream skimming, this is certainly a possibility. Individual charters may be either more or less homogeneous than the schools and districts from which they draw students. However, the detailed analysis in the LeRoy Collins Institute Report "Florida Charter Schools: Not as Good, or as Bad, as Advertised" suggests the pattern of economic and racial segregation across Florida's schools is not much altered by the presence of charter schools. Again, there is an important caveat—while this appears true now, it could change as charter enrollment grows.

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allegations-of-misapp and Bob Normal, July 10, 2017, "Paramount Charter School deemed nightmare by parents," Local10.com, https://www.local10.com/news/local-10-investigates/first-look-inside-nightmare-charter-school

[58] We confirmed the school opened the next academic year from their Facebook feed at https://www.facebook.com/pg/Championship-Academy-Elementary-Middle-School-Lauderhill-Campus-1772833439674955/posts/?ref=page_internal

[59] Michael Barthel and Kirsten Worden, June 29, 2021, *State of the News Media*, Pew Research Center, https://www.journalism.org/fact-sheet/newspapers/

- *Enrollment in Florida's charter schools does not appear to exhibit cream skimming or worsen patterns of economic or racial segregation.*

Charter Schools Drain Funding from Resource Starved TPSs

Funding follows charter school students, leaving TPSs with less funding than they otherwise would have had, and Florida's TPSs can reasonably claim to be starved for funding. From the National Center for Education Statistics' *Digest of Education Statistics*, Florida ranked 45th in total spending per pupil in the 2017-18 academic year, at 75% of the national average.[60] However, neither of these facts means fewer resources are available to TPS students because of charter schools; in fact, the opposite has likely been true historically.

Noncapital funding is allocated to charter schools through the FEFP in nearly the same way as it is for TPSs. The important difference is that the funding follows the student to their school in the case of charters, while the funding follows the student to the district and is thereafter allocated according to district practice in the case of TPSs. Details regarding capital funding are taken up below. For now, it will suffice to note that historically there was no regular continuing formulaic allocation of capital funding to charter schools. Districts could share some of their capital revenue with charter schools at their discretion, but it appears such sharing was relatively rare.

Why does the fact that funding follows the student not mean TPS students are harmed when students leave for charter schools? When a student moves to a charter school, the TPS loses both their funding and the expense of educating them. In general, this might be a net negative or positive for remaining TPS students. Consider a TPS that would operate with all classes at approximately the normal class size, but for students drawn away to a charter. If the charter draws relatively few students, the TPS might find itself operating as many classrooms as if the charter had not drawn of their students, but at generally less than efficient scale. In this case, TPS costs per student would be higher due to the charter. By contrast, consider a TPS that would operate with many classrooms at less than efficient scale but for students drawn away by a charter. If the student draws away enough students that the TPS can operate with fewer classrooms at closer to efficient scale, cost per student will be lower for the TPS than if the charter had not drawn away any of its students.

Since Florida is a steadily growing state, such effects are most likely negligible. Though TPS enrollment has been flat, existing school buildings have a limited useful life. We must continually remodel, repurpose, and replace existing buildings to keep up with a constant TPS population, and must continually replace teachers that leave. Problems with unfilled seats cannot be widespread in such circumstances, or we simply would not replace some old schools when they wear out or refill some teaching posts when they are vacated.

This may be a more salient issue in areas where enrollment declines faster than existing school buildings wear out and existing teachers exit. If a charter drew many students, it could increase per student costs in existing schools in such cases. In presenting potential concerns with charter schools, the NEA claims Detroit found itself with 30,000 unused student seats due to wasteful charter school competition.[61] However, since charters are public schools, district-level

[60] U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*. Accessed March 27, 2022 at https://nces.ed.gov/programs/digest/2020menu_tables.asp.
[61] From the NEA website at https://www.nea.org/student-success/smart-just-policies/funding-public-schools/charter-school-accountability, accessed June 18, 2021.

coordination could mitigate such problems in Florida if they did arise, either by not issuing redundant charters or by allocating existing unused space to charter schools.

The discussion so far considerably overstates the case against charter schools. As mentioned above, until recently, there was no regular recurring capital funding for Florida's charter schools. Since only non-capital funding followed students when they left a TPS for a charter, charter enrollment unambiguously increased per student funding for remaining TPS students unless their district chose to allocate a full pro rata share of capital funding to its charter schools. Florida Tax Watch estimated spending for the average charter student to be only 69% of spending on the average TPS student in Florida in the 2017-18 academic year.[62]

- *Funding follows students to their charter school, but so does the obligation to educate the student. This could leave the TPS with either more or less resources per student, but in a growing state any impact is likely negligible.*

Waste and Fraud

Waste and fraud certainly occur in Florida's charter schools. We need look no further than the case of Newpoint Education Partners. The company managed fifteen charter schools in Hillsborough, Pinellas, Escambia, Dade, Duval, Bay, and Broward Counties. Eleven of the fifteen schools closed with the other four continuing under new management.[63] The founder of the management company, Marcus May, was convicted of three felonies, sentenced to twenty years in prison, and fined five million dollars.[64]

Yet, waste and fraud occur in Florida's schools independent of the presence of charter schools. Consider the case of Monique Acevedo, sentenced to eight years in prison for stealing $413,000 from the Monroe County School District.[65] Her husband, Monroe School Superintendent Randy Acevedo, was convicted of felony misconduct for covering up her theft.

Better than asking whether waste and fraud occur in Florida's charter schools is to ask what is in place to limit their scope and whether related problems seem extensive or reasonably contained. To a taxpayer supporting schools and to students and parents looking to receive that support, public revenues that do not translate efficiently to student support are lost whether the loss was from poor management, malfeasance, fraud, or simple bad luck. From this narrow point of view, waste occurs whenever resources do not translate to their intended use and fraud is but one cause of such waste. We focus on waste in this broad sense.

As discussed in relation to accountability, charter schools must submit monthly financial statements to their district and must have an independent financial audit every year. If they show

[62] Florida Tax Watch. (2019) *The True Cost of Public Education in Florida 2.0*. Accessed June 25, 2021 at https://floridataxwatch.org/Research/Full-Library/ArtMID/34407/ArticleID/18695/The-True-Cost-Of-Public-Education-In-Florida-20.

[63] Megan Reeves, October 5, 2018, Guilty verdict for man who defrauded Newpoint charter schools in Pinellas, Hillsborough," Tampa Bay Times, https://www.tampabay.com/news/education/k12/Guilty-verdict-for-man-who-defrauded-Newpoint-charter-schools-in-Pinellas-Hillsborough_172308133/

[64] "Newpoint charter schools owner Marcus May gets 20 years in prison, fined $5 million." November 13, 2018. *Pensacola News Journal*. Accessed June 20, 2021 at https://www.pnj.com/story/news/crime/2018/11/13/newpoint-charter-schools-owner-sentenced-prison-fined-5-million/1992647002/.

[65] Cammy Clark. "Former Keys school official sentenced to 8 years in prison." September 1, 2010. *The Miami Herald*. June 20, 2021 at https://www.sun-sentinel.com/news/fl-xpm-2010-09-01-fl-ex-keys-schools-chief-wife-20100901-story.html.

signs of financial mismanagement, their charter may be revoked. Of course, school districts may lack the resources to sufficiently monitor charter schools or may not be sufficiently diligent in that regard. The Newpoint Education Partners case shows this potential. *The Tampa Bay Times* investigation into the case shows that Hillsborough County school officials suspected problems years before public awareness but were unable to take action except to close one particularly problematic high school.[66] If a district fails to spot serious fraud or waste at a charter school, the school is still subject to market accountability. If the waste becomes large enough to severely impact the school, it may eventually become unable to attract sufficient enrollment to remain open. That mechanism to limit waste does not apply to TPSs.

If a charter is closed for any reason, measures are in place to limit resulting resource loss. First, all unencumbered property purchased with public funds reverts to the local school district.[67] Second, payments are made to charters on a monthly or bimonthly basis corresponding to the items enumerated on the financial statements the charter submits to the district. There is very little scope for the charter school to build up a large amount of public money with which individuals may abscond upon a school's closure.

While the various accountability related mechanisms discussed so far should limit the scope for waste of any type in charter schools, including pernicious fraud but also unintentional mismanagement, there is perhaps a stronger argument to be made by taking a broader perspective. To summarize the discussion above, charter schools perform on par with TPSs without engaging in systematic cream skimming and have done so historically at a cost well below the expenditure per student in Florida's TPSs. Thus, if there is a problem with resource stewardship in Florida's public schools, it is not concentrated in charter schools. The usual caveat applies—this appears to have been true up to now, but with continued charter enrollment growth things might change.

- *Waste and fraud in Florida's charter schools are limited by financial reporting requirements, by the limitations on funding disbursements, and by the market discipline imposed by the need to attract and retain students.*

### 10.2. Charter School Capital Funding

The discussion above suggests most potentially legitimate concerns of charter school critics turn out to have little impact in Florida, at least so far. However, there are clear issues associated with the way charter school capital is financed, to which we now turn.

Sources

Currently the largest source of charter school capital funding is appropriations made by the Florida legislature from the Public Education Capital Outlay and Debt Service Trust Fund (PECO).[68] For

[66] Colleen Wright, May 15, 2016, "A Times investigation: Documents point to inflated spending at troubled Pinellas charter schools," *Tampa Bay Times*, at https://www.tampabay.com/news/education/k12/a-times-investigation-documents-point-to-inflated-spending-at-troubled/2277513/

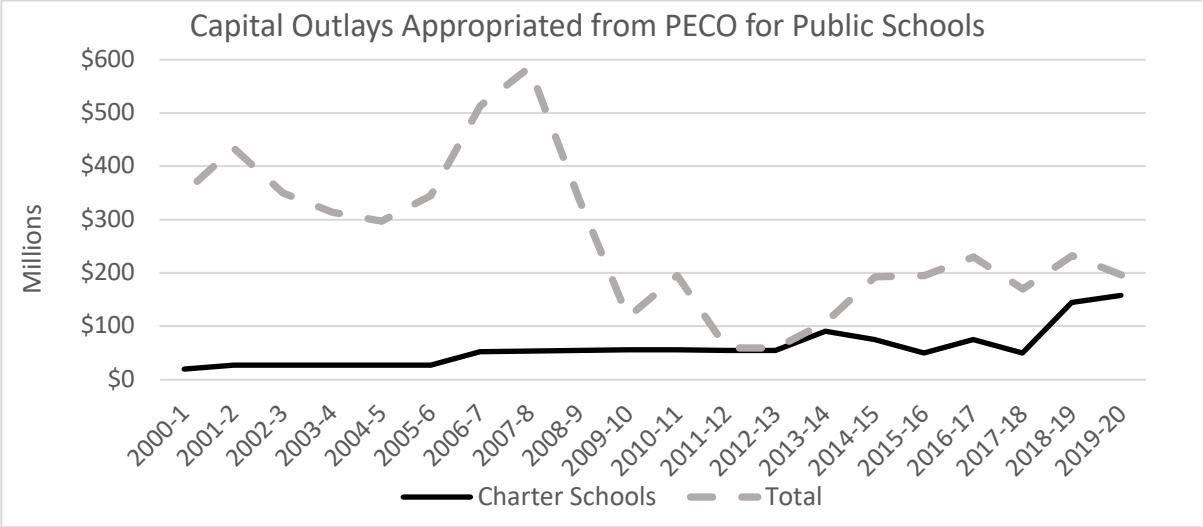
[67] 2021 Florida Stature 1002.33 at http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=1000-1099/1002/Sections/1002.33.html

[68] 2019 Florida Statutes 1013.62, http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=1000-1099/1013/Sections/1013.62.html

example, in the 2019-2020 state budget, the legislature appropriated $158,209,945 from PECO.[69] In the 2018-2019 state budget, the legislature appropriated $145,286,200 for charter schools' fixed capital outlays. Those appropriations represent a dramatic increase from previous appropriations. From 2000-2018, annual appropriations from PECO for charter capital outlays averaged $49,107,628. The maximum single year appropriation prior to 2018-2019 was $90,604,553 in 2013-2014. As shown in Figure 24, these recent changes mean that the bulk of public-school PECO appropriations now go to charter schools.

- *The bulk of PECO public school appropriations now go to charter schools.*

*Figure 24*




State appropriations for charter schools from the Public Education Capital Outlay and Debt Service Trust Fund (PECO) can be found in the annual general appropriations bill which can be accessed via a webpage maintained by the State Library and Archives of Florida at http://laws.flrules.org/.

In addition, the local school district may voluntarily allocate some of its discretionary property tax revenues to capital outlays for charter schools.[70] In addition, starting in 2019-2020, revenue resulting from local discretionary capital property tax revenues must be shared with charter schools for capital outlays if the amount of state funds appropriated for charter school capital outlay is less than an amount defined in Florida statute. This amount is calculated each year by taking the average charter school capital outlay appropriated per full-time equivalent student by the state legislature for the 2017-2018 fiscal year multiplied by the total number of charter school students for the applicable fiscal year. This figure is then adjusted by Consumer Price Index

[69] State appropriations for charter schools from the Public Education Capital Outlay and Debt Service Trust Fund (PECO) can be found in the annual general appropriations bill which can be accessed via a webpage maintained by the State Library and Archives of Florida at http://laws.flrules.org/.

[70] 2019 Florida Statutes 1013.62 (1) http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=1000-1099/1013/Sections/1013.62.html and 2019 Florida Statutes 1011.71(2), http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=1000-1099/1011/Sections/1011.71.html

issued by the United States Department of Labor from the previous fiscal year. If the state appropriates less than this amount, districts must make up the difference.[71]

Prior to the 2017 legislative session, local school boards were not required to share revenue with charter schools for capital outlays but had the option to do so, as they still do today.[72] In its 2017 legislative session, the Florida legislature required local school boards to share some property tax revenue with eligible charter schools regardless of the level of state funding.[73] In the 2018 legislative session, the legislature adjusted this requirement so that, starting in 2019-2020, local school boards need only share property tax revenue if state appropriations fell below a threshold calculated according to the statute. In addition, the 2018 legislation did not require local school boards to share property tax revenue in 2018-2019.[74] For 2019-2020, the system described above, with state appropriations for capital funding and local contributions only kicking in when those fall short, was implemented.[75] This state of local revenue sharing potentially results in uncertainty as the amount local school boards must transfer to charter schools can vary from year-to-year depending on the level of state appropriations. [76]

The previous discussion focused on funds earmarked for capital outlay. However, charter schools can use other government funds for capital outlay if they choose. As the goal of charter schools is to provide more flexibility in how the school operates, few limitations are placed on how charter schools spend the funds they receive. Each charter school receives a proportion of state and local school operating resources determined (roughly) by the number of students enrolled at the school. These funds can be spent largely as the charter school deems necessary and can be spent on capital outlays such as long-term leases and building of facilities.[77] In fact, prior to the recent moves towards appropriating more capital funds to charter schools, and during the first two years of operation for new charter schools when they are often not eligible for capital funds, these may be the only funds available to secure capital resources.

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[71] 2019 Florida Statutes 1013.62, http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=1000-1099/1013/Sections/1013.62.html. Instructions for calculating Full Time Equivalent students for 2018-2019 are here: http://www.fldoe.org/core/fileparse.php/7508/urlt/1819FTEGeneralInstruct.pdf

[72] 2016 Florida Statues 1013.62(1), http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=1000-1099/1013/Sections/1013.62.html

[73] Laws of Florida Chapter 2017-116 at http://laws.flrules.org/files/Ch_2017-116.pdf, 2017 Florida Statutes 1013.62 (3), http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=1000-1099/1013/Sections/1013.62.html, and 2019 Florida Statutes 1013.62, http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=1000-1099/1013/Sections/1013.62.html. Also see Scott Travis, June 15, 2017, "Florida charter schools: Here's what will change under education overhaul," *South Florida Sun Sentinel*, https://www.sun-sentinel.com/news/education/fl-reg-charter-schools-more-money-20170613-story.html

[74] Laws of Florida, Chapter 2018-6, at http://laws.flrules.org/files/Ch_2018_006.pdf.

[75] 2019 Florida Statutes 1013.62, http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=1000-1099/1013/Sections/1013.62.html

[76] Jessica Bakeman, February 19, 2018, "A Shortcut To House Education Mega-Bill 7055: Here's What's In It And Why You Should Care," WLRN at https://www.wlrn.org/post/shortcut-house-education-mega-bill-7055-heres-whats-it-and-why-you-should-care

[77] 2019 Florida Statute 1002.33 (17), http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=1000-1099/1002/Sections/1002.33.html

Eligibility

While all charter schools receive operating funds, not all are eligible to receive capital outlay funds. To be eligible to receive capital funds, a charter school must meet the following criteria:

1. Meet at least one of the following five criteria
   a. Have been in operation for 2 or more years
   b. Be governed by a governing board established in the state for 2 or more years which operates both charter schools and conversion charter schools within the state[78]
   c. Be an expanded feeder chain of a charter school within the same school district that is currently receiving charter school capital outlay funds
   d. Have been accredited by a recognized regional accrediting association
   e. Serve students in facilities that are provided by a business partner for a charter school-in-the-workplace pursuant to s.1002.33(15)(b)[79]
2. Have an annual audit that does not reveal any of the financial emergency conditions provided in s.218.503(1) for the most recent fiscal year for which results are available.[80]
3. Have satisfactory student achievement based on applicable accountability standards.
4. Have received approval from its sponsor pursuant to s.1002.33 for operation for that year.
5. Serve students in facilities that are not provided by the charter school's sponsor.[81]

To receive capital funding, an eligible charter school must apply to the Florida Department of Education. The Florida Commissioner of Education makes the final determination of eligibility.[82] In 2018-2019, 574 Florida charter schools received capital outlay funding.[83]

The Nature of Capital Expenditures

Since charter schools have not had access to regular significant capital funding until recently, how did they acquire capital resources? Systematically studying expenditures on capital resources by Florida charter schools would be a challenging undertaking as, to the best of our knowledge, there is no dataset with data on such expenditures organized in a way amenable to analysis. However, required independent financial audit reports are posted on the Florida Auditor General's website.[84] These reports are not detailed accounts of the school's expenditures in well-organized categories,

[78] A "conversion charter school" is a traditional public school that has been converted into a charter school. See 2019 Florida Statutes 1002.33 (3) (b), http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=1000-1099/1002/Sections/1002.33.html

[79] A "charter school-in-the-workplace" is a charter school located in a business or corporation. Children of the employees of the business have preference in enrollment. 2019 Florida Statutes 1002.33 (10) (d) 4.a. and 1002.33 (15)(B), http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=1000-1099/1002/Sections/1002.33.html

[80] 2019 Florida Statutes 218.503 (1), http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0200-0299/0218/Sections/0218.503.html

[81] 2019 Florida Statutes 1013.62 (1) (a), http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=1000-1099/1013/Sections/1013.62.html

[82] See the description on the Florida Department of Education's website at http://www.fldoe.org/schools/school-choice/charter-schools/business-finance-accounting/capital-outlay-funding.stml

[83] Charter school capital outlay is available on the Florida Department of Education's website at http://www.fldoe.org/finance/fco/charter-school-capital-outlay/.

[84] The reports are available at https://flauditor.gov/pages/chschools_efiles.html.

but they do allow certain basic questions to be answered. We examined the reports of five randomly chosen charter schools that received capital funds from each of five different school districts: Broward, Duval, Escambia, Hillsborough, and Sarasota. From among counties with significant charter enrollment, four were selected for their geographic spread: Broward in the south, Duval in the northeast, Escambia in the northwest, and Hillsborough centrally. Sarasota was included to include a district that is relatively high in income, wealth, and taxable value per student.

First, we used the audit reports submitted by charter schools for 2017-2018 to get a sense of how often charter schools own or lease their facilities. In 2017-2018, the twenty-five schools analyzed received an average of $315,133 and a median of $145,760 in capital funding from local and state sources. The highest amount received by a single school was $2,252,278 while the lowest amount was $16,223. Of the twenty-five schools, twenty-three leased at least one building and eight owned at least one building. Five of the schools owned at least some land. Besides spending money on facilities leases and purchasing land and buildings, the schools spent money on building improvements, equipment, furniture, and vehicles.

Across all twenty-five schools the average amount spent on leasing facilities in 2017-2018 was $395,061 and the median amount was $213,299. Sixteen of the schools spent more on leases than they received in capital funding. Eight spent less on leases than they received in capital funding. Four of these schools were in Sarasota and the other four were in Escambia. Therefore, most schools must have been making up the difference from other funds. Even the schools that received more in capital funding than they spent in leases might have still spent more in capital outlays than they received, since leases are not the only capital expenses. Charter schools appear to have been far more likely to lease their facilities rather than to purchase them. They are also likely to receive less in capital funding from the state and local governments than they spend on capital services.

- *Charter schools are far more likely to lease facilities than to own them and receive less in capital funding than they spend on capital services.*

We also sought to get some notion of how capital funding varied from school to school. To do this, we used a report published by the Florida Department of Education on capital funds disbursed to individual schools alongside the audit reports to estimate capital funds received by the individual schools between 2016-2017 and 2018-2019.[85] Capital funding for charter schools varied dramatically from district to district. This will likely no longer be the case with the changes made by the state legislature in 2018 to how capital funding for charter schools works, as the amount each school gets is now determined (roughly) by the number of full time equivalent (FTE) students it enrolls. However, should a local school district choose to share locally controlled funds with charters for capital outlays, local differences in tax base would continue to create differentials in capital funding for charter schools.

While local governments were not mandated to share capital funds in any year other than 2017-2018, they could if they wished to in other years. Of the five districts examined, only Sarasota appears to have voluntarily shared funds for capital outlays, having done so in 2016-2017 and 2018-2019, the amounts of which we obtained via public records request. However, its voluntary

[85] Data on disbursements is available on the Florida Department of Education's website at http://www.fldoe.org/finance/fco/charter-school-capital-outlay/

contributions were far below what it was required to share in 2017-2018 and, thus, schools received much less in capital funding in both years than they did in 2017-2018.

A school district may also directly provide capital resources to charter schools. For example, a school board may house a charter school within its own facilities. However, out of all the charter schools in the five counties examined, only one, in Escambia, is housed in a building owned by the school board and that school is run by the school board itself.[86]

- *It appears rare for districts to share capital funding with charter schools or to directly provide significant capital services for charter school use.*

### 10.4. Adequacy, Equity, and Charter School Funding

We saw above that potential capital funding per student was $1,288 in 2018-19. After adjusting for differences in the cost of capital across districts, potential (real) capital per student was $1,278. The difference is due to the positive correlation between taxable value and the cost of capital. PECO funds earmarked for charter schools came to $478 per charter school student. Charter enrollment is disproportionately in high capital cost areas—nearly 44% of charter school enrollment in Fall 2018 was in Broward, Miami-Dade, or Palm Beach counties. Adjusted for the capital cost differences, the average charter school student had available $463 in capital per year valued at the state average capital cost. Not all charter schools were eligible for this funding, so the amount per eligible student would have been higher.[87] Assuming sharing of local capital funding with charter schools by local districts is negligible, and so treating it as zero, the potential capital available to the average TPS student was $1,378. Three sources of inequity are apparent.

First, students in charter schools receive far less annual capital support on average than do TPS students. It is difficult to see how this disparity can simultaneously comport with the fact that charter schools are public schools and the fact that public school funding must be uniform according to the state constitution.

Second, like capital funding for TPSs, charter capital funding is not adjusted for differences in capital cost. Thus, while funding is nominally allocated on a per FTE basis, the student weighted standard deviation of annual capital resources per student allocated to charters is $76, with an inter-quartile range of $383 to $536. Annual charter capital support per student, in real terms, is far from uniform across districts.

Third, since taxable value per student varies greatly across districts, the disparity in capital support per student between students in charters and TPSs also varies greatly. The student weighted standard deviation of this difference is $535, with an inter-quartile range of $544 to $1,151. In five rural districts with very little taxable value per student, the differential is negative, meaning charter capital support is slightly higher than potential capital per TPS student. *However, there are no charter schools in those districts*. The difference exceeds $1,000 in seventeen districts (excluding the odd case of Jefferson), which together contain over 45% of the state's charter students. This

[86] The relevant report is available from the Florida Auditor General's website at https://flauditor.gov/pages/chschools_efile%20rpts/2018%20byrneville%20elementary%20school.pdf.

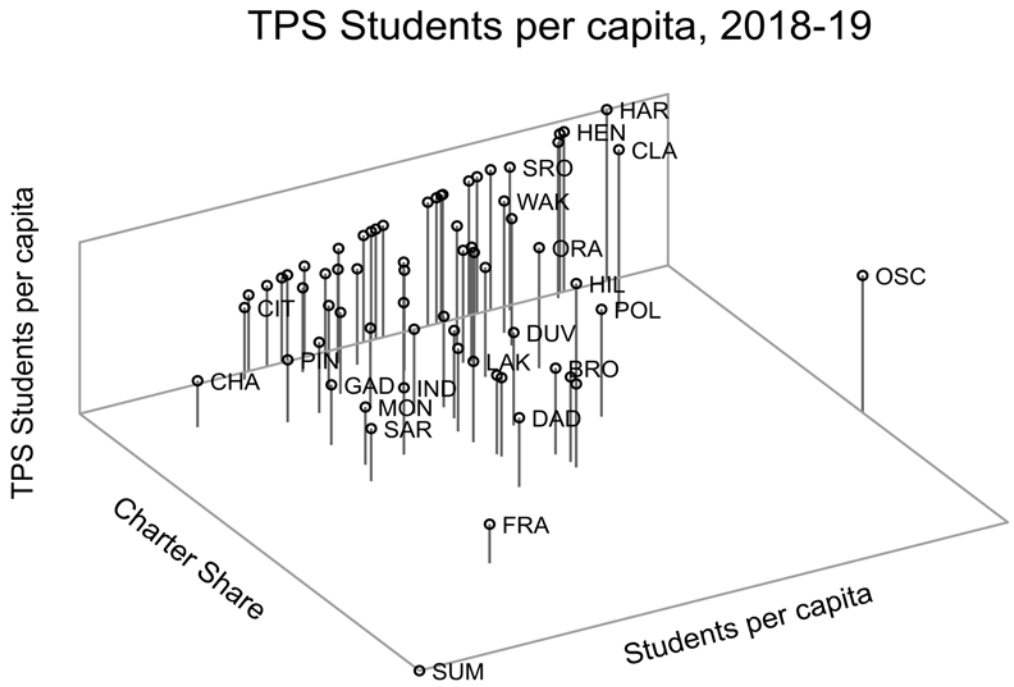
[87] For purposes of this analysis, we assume none of the PECO funding appropriated for charter schools goes to Jefferson County. Since the entire Jefferson district was operated by a charter management company in 2018-2019, this may seem odd. However, all local discretionary revenue and non-charter specific PECO funds and CO&DS funds are available to the charter since there are no other schools to use it.

represents a serious competitive disadvantage for charter schools relative to TPSs in the locations with the highest levels of taxable value per student.

- *Charter school capital funding is characterized by three inequities: charters receive far less support for capital services than TPSs in the same district, capital support varies considerably between charters in different districts due to variation in the cost of capita, and the gap between charters and TPSs within districts varies greatly across districts*

The relationship across districts between charter share, students per capita, and TPS students per capita is shown in Figure 25. Consider, for example, Sumter and Franklin. From the point of view of school capital, both are blessed with high taxable value per student, Franklin because of its location on the Gulf of Mexico and Sumter due to the Villages. That advantage is magnified by the fact that both have relatively high shares of charter school enrollment.

*Figure 25*




1) Student count from the 2018-19 FEFP Final Calculation, http://www.fldoe.org/core/fileparse.php/7507/urlt/1819FEFPFinalCalc.pdf.
2) Population from the U.S. Census Bureau, https://www.census.gov/.
3) Charter share is calculated from the National Center for Education Statistics Common Core of data, https://nces.ed.gov/ccd/. Jefferson, with a 100% charter share, is excluded.

A more subtle factor is at work here as well. Potential capital per TPS student, assuming the district does not voluntarily share capital resources with charter schools, equals taxable value per capita divided by TPS students per capita and the cost of capital. TPS students per capita is in turn students per capita multiplied by one minus the charter enrollment share. Thus, capital available to TPS students increases with the share of charter schools in district enrollment. This likely has a feedback effect on the competitiveness of charter schools.

The more successful charters are at attracting students, the larger their funding disadvantage becomes relative to TPSs in their district. With a bit of algebra, it is possible to show that the difference between annual TPS capital resources and charter capital resources is inversely proportional to the share of district enrollment in TPSs. To see how much this can matter, consider Dade. For 2018-19, in Dade the share of charter students was 0.1954, charter capital per student was $383, capital per student (overall) was $1,309, and capital per TPS student was $1,534, so charter schools faced a $1,151 disadvantage. If charter enrollment had been 0, the disadvantage would have been only $926. However, if charter enrollment were to grow to 0.5, the charter school disadvantage would grow to $1,852. Thus, the magnitude of the anticompetitive effect can be large.

- *The more successful charters are at attracting students, the larger the funding advantage becomes for TPSs.*

The most common concerns raised about charter schools seem to have little impact, at least in Florida, and at least so far. However, the way charter school capital funding is currently allocated significantly contributes to inequity in the state's PK-12 capital funding. It is not clear how well this phenomenon is understood. Do families, and voters generally, who favor school choice and charter schools understand that charter capital is far under-funded relative to TPS schools? Do teachers worried about charter schools understand that they will have more resources per student if charters take more students as matters now stand? Do policy makers understand that the more cost-effective charters are in a district, judged by their attractiveness to students and families, the more funding TPSs receive per student and the harder it becomes for charter schools to compete? Whatever one's position on the desirability of charter schools, these complexities have important implications for Florida's public schools, both traditional and charter.

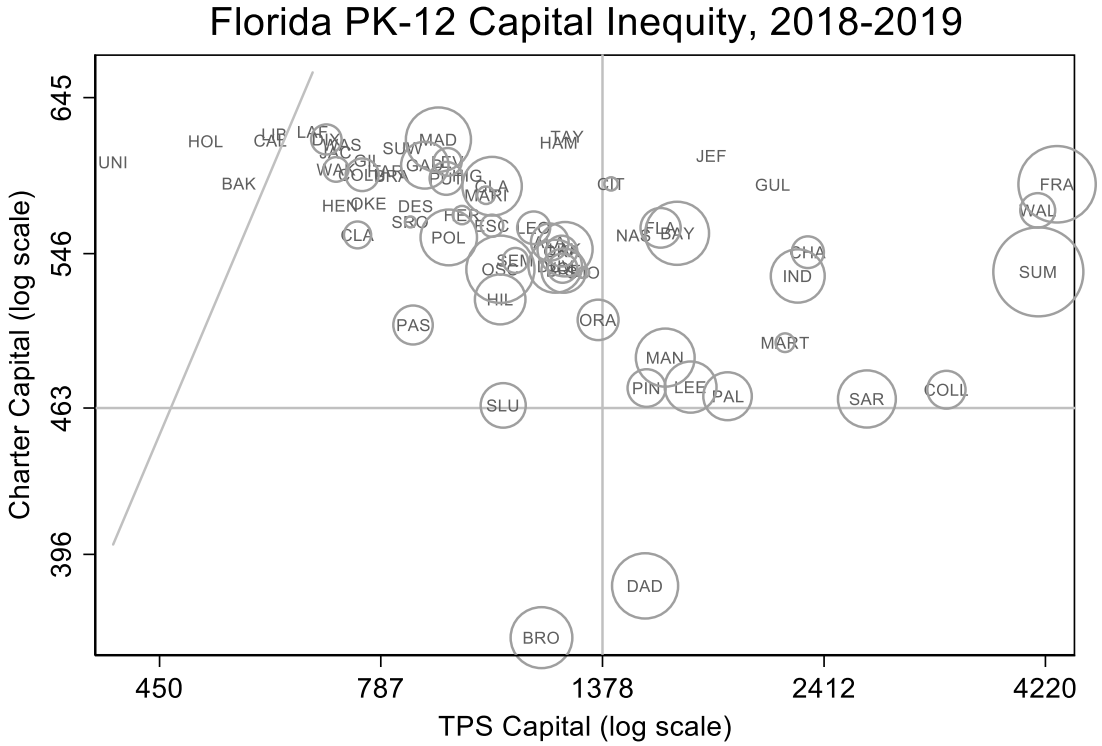
Despite the uniformity requirement of Florida's constitution, PK-12 capital resources in Florida are very unequal whether one compares TPS and charter schools within a district, TPS schools across districts, or charter schools across districts. The degree of this inequity is summarized in Figure 26. The vertical line is the TPS student weighted average (potential) capital. The horizonal distance from this line indicates inequity between TPS students across districts. The horizontal line is the charter student weighted average capital. Vertical distances from this line indicate inequality between charter schools across districts. The line in the upper left is the 45-degree line, indicating equality between charter and TPS capital. For example, the vertical distance from this line indicates the advantage of TPSs relative to charters within district. The size of the circles is proportional to the share of charter schools in district enrollment.

In interpreting Figure 26, it is important to remember four things. First, these are dollars adjusted for differences in capital costs, not nominal dollars allocated to a district. Second, the capital cost index employed is a reasonable but likely imprecise approximation. Third, potential capital is calculated assuming all districts set the maximum rate of 1.5 mills. Finally, fourth, the minimal amount of PECO funding not ear-marked for charters is assumed to be allocated proportional to students in the long run. Thus, while the figure contains important information regarding the overall pattern and the general position of each district, each district's estimated position should not be taken as highly precise.

Driven by differences in taxable value per capita, students per capita, charter enrollment share, and capital cost, capital inequity is extensive. Let us consider some cases from each quadrant of Figure 26 to make it clear how to interpret the figure and to better help us understand the

magnitude of what is involved. In doing so, we should keep in mind that there is extensive variation between schools within each quadrant as well.

*Figure 26*




1) Circle area is proportional to the share of charters in district enrollment.
2) Monroe is off the chart to the bottom right at $262 for charter students and $3,418 for TPS students.

The only three districts that lie well below average charter capital are Broward, Dade, and Monroe. They are below average due to their relatively high capital costs. Monroe is off the chart in the lower right quadrant, the only district that is well within that quadrant. Capital per student is much lower everywhere for charters than for TPSs, but after adjusting for cost, charter funding in Monroe is only 57% of average charter school capital. While Monroe faces very high capital costs, taxable value per student in Monroe is extremely high. As a result, potential capital per TPS student in Monroe is nearly three times the state average capital per student.

Now consider Dade and Broward, which accounted for nearly one-quarter of total enrollment and over one third of charter enrollment in Florida in 2018-19. Due to high capital costs, charters are disadvantaged relative to charters in other districts. TPSs in Broward are disadvantaged relative to TPSs in other districts if we take the rough and ready capital cost index at face value. However, it is probably better to say TPSs in Broward are near the state average for TPSs. Like Broward, charters in Dade are disadvantaged relative to charters in the rest of the state due to high capital costs and TPSs in Dade are near the state average for TPSs. TPSs in Dade and Broward have a great capital advantage relative to charters in those counties.

With a couple of obvious exceptions, districts in the upper right have attractive coastal locations that yield high property values related to tourism, but not the very high levels of population that drive up land costs and therefor capital costs. One of the exceptions is Sumter,

which has lots of taxable value because it has few students per resident, due to the villages, while still having relatively low capital costs. Further, since the share of charter schools in enrollment is high in Sumter, potential capital per TPS student is even higher.

The other exception is Jefferson, a very atypical case. Its potential TPS capital in fact goes to schools managed by a charter company. Jefferson's position on the vertical axis identifies where a hypothetical independent charter located in Jefferson would fall. Jefferson is atypical in another way as well. Potential TPS capital is high in Jefferson because few school-aged residents attend Jefferson district schools. While there are 79 students enrolled in Florida's public schools per 100 residents aged 5 to 19 statewide, there are only 41 in Jefferson.

This leaves the upper left. Above the 45-degree line are rural districts where capital costs and taxable value per capita are very low so charter capital would exceed TPS potential capital, if there were any charter schools there. However, there are no charter schools in these districts, presumably because population density is not sufficiently high to support more than one school within a reasonable distance of most students. That is, the districts' TPSs are natural monopolies, like electric utilities.

Finally, consider the districts that lie well within the upper left quadrant but well below the 45-degree line. They are more populous, including larger districts such as Escambia, Hillsborough, Marion, and Pasco. Many have significant charter enrollment. While charters in these districts are disadvantaged relative to the district's TPSs, the difference is not as large as in the other quadrants. TPSs in these districts are at a disadvantage relative to the state average as well, while charters in these districts are at an advantage relative to the state average.

# 11. Redressing Inequity

The inequality of sustainable annual capital services may be addressed by incorporating capital funding within the structure of the FEFP. Doing so requires, at a minimum, two changes. First, state funding must be allocated to ensure the 90% local effort cap is met once capital is included—that is to ensure each district receives 10% of its FEFP funding, including capital, from state sources. This can be done by reallocating existing funding or by allocating additional funding. Second, a capital cost index must be developed. Two related changes, though not strictly necessary, deserve mention. First, capital input requirements, not just cost per unit of input, likely vary with geographic characteristics. Second, the various elements of the FEFP, e.g., the proposed capital adjustment, the district cost differential, the sparsity supplement, and the transportation allocation, should work in harmony with one another. We discuss each of these in turn. We then present a hypothetical allocation that is fiscally neutral and illustrate the impact of capital equalization within the broader context of the FEFP.

- *Inequity in capital support may be addressed by incorporating capital funding within the structure of the FEFP.*

## 11.1 Funding the 90% Cap on Required Local Effort

A requirement built into the FEFP is that at least 10% of FEFP funding for each district must come from state sources. State funds are distributed to compensate for variations in taxable value per student except in districts in which doing so would violate this cap, in which case the allocation is adjusted accordingly. Each year required local effort millage is capped in a small number of counties with high taxable value per student. Unsurprisingly, there is considerable overlap between districts at the 90% RLE cap and those that set local discretionary capital millage below its cap. State funds are needed to make up for the local funding foregone by reducing required local effort in the districts with the most taxable value per student.

The higher the share of local funding in the FEFP, the higher the required local effort millage rate, the more counties at the cap, and the less efficiently the property tax base is used. There are two aspects to this inefficiency. First, the tax rate is lower precisely where the resource to be taxed is highest, disproportionately reducing revenue. Second, as discussed earlier, the statewide tax rate on the annual services of structures is higher than the tax rate on other things people purchase, inefficiently increasing the excess burden of taxation, and increasing the millage rate to make up for less state funding exacerbates this difference.

Thus, there is a sound argument for increasing state funding in the FEFP. We consider equalization with an increase in state funding in the next section. Doing so, however, may be infeasible due to political resistance to tax or spending increases in and of themselves, aside from whether they are justified from a benefit-cost perspective. Therefore, in this section we consider revenue neutral, albeit economically inefficient, capital equalization.

## 11.2 Indices of Capital Cost

Within the FEFP the District Cost Differential (DCD) adjusts for differences in non-capital costs, often referred to as operating costs. It does so using an index of differences in labor costs, the Florida Price Level Index (FPLI), which account for 80% of non-capital costs, and assuming other non-capital costs, such as paper or books, cost the same everywhere because they are easily

transportable from location to location. Base non-capital funding per student is then multiplied by the DCD. A similar approach may be applied by multiplying a base level of capital funding per student by a capital cost index (CCI).

Construction of a CCI would be broadly along the lines of the version used herein. To implement such an index, it would be necessary to determine the share of capital expenditures on large classes of items. That determination would require extensive work with school districts and Department of Education staff. Likely candidates for these categories are as follows. 1) Things which are highly transportable and so cost about the same everywhere, for example desks. 2) Labor, used for example in building maintenance. 3) Structures. This might be separated into land, labor, and transportable components, which are all separately estimated, estimated in aggregate, for example with an office rent index, or some combination thereof.

Once relevant categories and their approximate expenditure shares were identified, the next step would be to construct measures of the cost of standardized representative items for each category across Florida's districts. It would be possible to use the FPLI to represent relative labor costs. Analysis of data from annual tax rolls might be one component of estimating structure costs, for example.

Identifying expenditure shares for different types of capital related expenditures, and measuring their relevant costs, would allow us to answer this question: "How much would it cost to provide a standard set of capital inputs in each of Florida's school districts." Preparing a methodology to estimate such an index that is suitable for use in school funding would take considerable time and effort, but it would be relatively straightforward. With such an index, a methodology for equalizing capital support across Florida within the FEFP becomes straightforward. However, there are other relevant issues that should also be explored. These relate to this related question: "How many units of capital are needed in different districts to provide a given level of service."

### 11.3 A Capital Input Requirement Index

In the FEFP, non-capital funding is adjusted by a sparsity index. The idea is that more operating inputs are needed per student in districts in which a small population of students is spread over a large geographic area. Class sizes will likely be smaller. Busses will cover more miles and operate with fewer riders per mile driven. Holding the cost of non-capital inputs constant, more funding is needed per student if population density is below some threshold.

The same argument applies to capital expenditures. This suggests the possibility of using the existing sparsity adjustment to adjust capital funding. That is possible. However, in their 2003 report on the FEFP, Jim Dewey, Dave Denslow, and Babak Lotfinia argued the formula used for the sparsity index, developed half a century ago, might have become outdated since Florida's population density has grown and in light of evidence that the minimum efficient scale may be fairly small.[88] A current study of differential requirements for capital and non-capital inputs associated with geographic population patterns seems warranted if we are to try to equalize capital resources available to each student.

[88] Jim Dewey, Dave Denslow, and Banak Lotfinia. 2004. *Research on the Florida Education Finance Program: the Florida Price Level Index, the Sparsity Supplement, and Discretionary Millage*. https://www.researchgate.net/publication/359504595_Research_on_the_Florida_Education_Finance_Program_the_Florida_Price_Level_Index_the_Sparsity_Supplement_and_Discretionary_Millage

There are two apparent, and likely complementary, approaches to analyzing this question. The first is to use the pattern of variation of capital expenditures, population density, operating expenditures, and school performance (e.g., scores on the National Assessment of Educational Progress) across US districts to model how the capital needed to achieve any level of service varies with geographic characteristics and translate these results to the characteristics of Florida's districts. The second is to employ simulation and optimization techniques, geographic information system data on the dispersion of the population in each district and the road network, and a model of maximum acceptable class sizes and transportation times, to estimate the minimum cost of providing a standardized educational unit in each district.

The micro data and computational power needed to perform such analyses were simply unavailable when the sparsity index was developed. While it is feasible now, done properly it would involve a great deal of time and effort. The results of such an analysis would be applicable to both capital and non-capital funding. As is perhaps obvious in the foregoing discussion, equitable funding of capital and non-capital services are related, among other ways, through transportation costs and the number of classrooms per student. Thus, such a study would ideally also address the methodology for transportation cost adjustments, so that the input cost and quantity adjustments for labor, capital, and transportation, worked in harmony with one another.

### 11.4 Revenue Neutral Capital Equalization within the FEFP

We now consider equalizing capital within the FEFP without increasing funding. This is not meant to imply that this is the best approach. The intent is simply to show that equalization is possible even if it is infeasible to increase state revenue, to discuss what such a process would look like, and to illustrate the resulting financial impacts.

We continue to use 2018-2019 as our starting point for several reasons. Data for some of the variables needed are available with a considerable lag and 2018-19 was the latest available when this work was done. That year is fully after recovery from the great recession. It is also prior to Covid-19. Thus, it is both relatively recent and likely reasonably representative. However, we should not think of the exact actual 2018-2019 funding as the benchmark. Rather, we have made, and will continue to make, small changes from actual 2018-2019 funding. For example, we will ignore Florida Virtual School and the various lab schools and focus only on the 67 districts. We make a few other changes, as described below. These are intended to create a "typical" comparison year, leaving aside matters that might be specific to 2018-2019 but change a bit from year to year and details that complicate matters but are outside of our focus (e.g., lab schools).

For the capital cost index, we use the rough and ready version from section 9. That means impacts on specific districts will be estimated imprecisely, and so should be taken with a grain of salt. We make no adjustment for differences in required capital per student, for example due to sparsity. Such adjustments might prove important for smaller districts in practice. However, precise estimates of impacts on individual districts are not the right focus given our purpose. Rather, the relevant lessons are in the pattern of impacts across districts of different types.

We provide for capital in the FEFP as follows. First, rather than a 1.5 mill local discretionary capital levy, we make capital millage a part of required local effort (RLE) in the FEFP. As part of the FEFP, the millage rates are adjusted by the relative degree of underappraisal in different counties in calculating RLE, so that the effective millage rate adjusted for the appraisal ratio in the county is the same in all counties not at the RLE cap. In our hypothetical allocation

this applies to the capital levy as well since it is rolled into RLE. The required local effort capital millage is not set to exactly 1.5, but rather is chosen so that after adjustment for relative appraisal ratios the aggregate amount of local revenue raised remains unchanged. In this case that required a rate of 1.51. Second, we add the local cost of the state average potential capital per student from 2018-2019, $1,278, adjusted to local cost by multiplying by the CCI, to each district's FEFP funding. For example, the CCI for Alachua is 0.8644, and 2018-2019 unweighted FTE for Alachua was 29,079, so the hypothetical FEFP allocation for capital for Alachua is 0.8644×$1,278×29,079, or $32.1 million. Third, we calculate required local effort as the minimum of 90% of this new capital inclusive FEFP allocation or the adjusted required local effort millage rate multiplied by taxable value for school purposes. The remainder comes from state funds.

To facilitate meeting the 90% RLE cap with a higher level of local FEFP spending due to including capital, we count both categorical programs that were outside of the 2018-2019 FEFP, the Class Size Reduction appropriation and District Discretionary Lottery and Florida School Recognition Program funds, as FEFP funds. By counting them as part of the FEFP, local funding can be higher, by nine times the amount of this funding, before it reaches the 90% RLE cap. This makes more efficient use of the property tax base and makes it easier to equalize capital resources. The spirit of the 90% cap is to ensure each district receives at least some meaningful level of state funding. It seems that both categorical programs are meaningful sources of state funds for purposes of the RLE cap, so we count them as such. Thus, we hold total state funding constant at the sum of net 2018-19 state FEFP funding, the Class Size Reduction appropriation, District Discretionary Lottery and Florida School Recognition Program funds, CO&DS funds, PECO PK-12 funds, and what we have called the RDLA, $12.2 billion in total, but we count them all as FEFP funds for purposes of the 90% RLE cap.

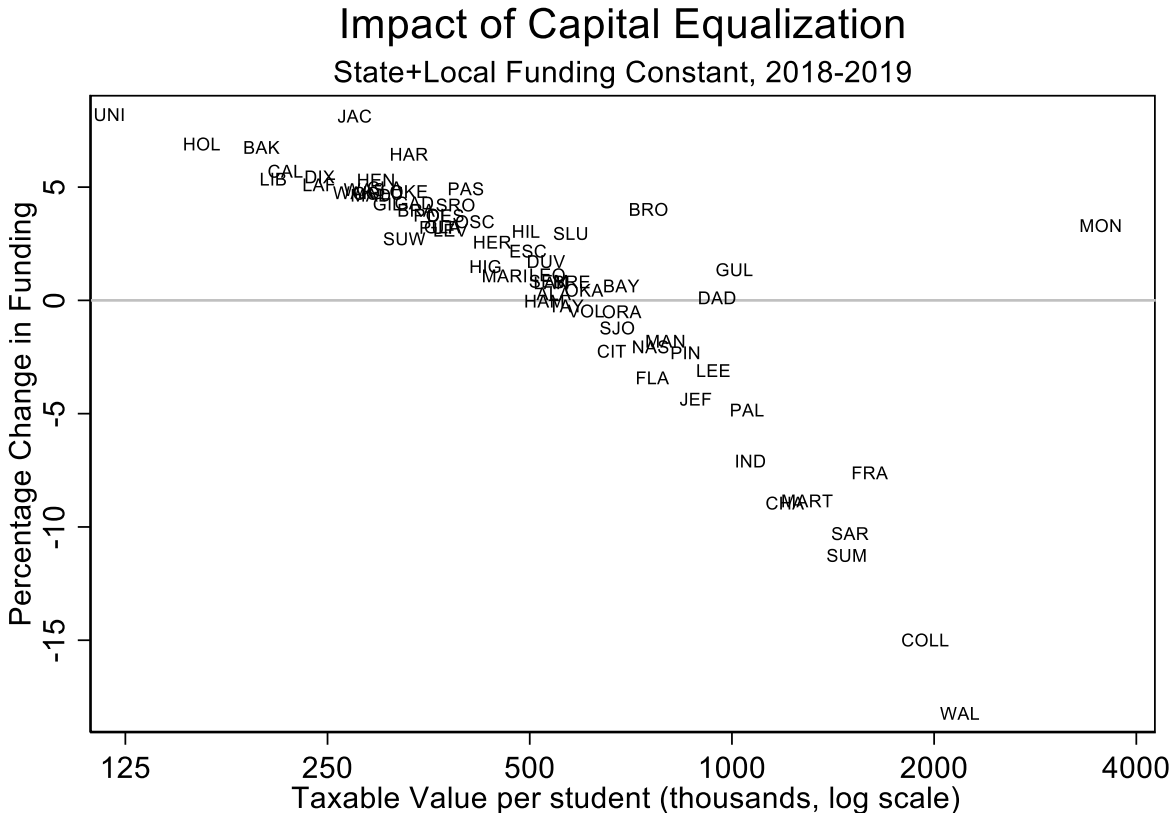
We make one further change to facilitate meeting the 90% RLE cap once capital is included—we eliminate the Funding Compression Allocation (FCA) so those state funds can be allocated as needed to meet the cap. Beginning in 2018-2019, the FCA has compressed total FEFP funding by providing up to $100 per student for districts whose per student funding was below the state average the previous year. For 2018-2019 the allocation was $56.8 million. We think it is reasonable to use these funds as needed to meet the 90% RLE cap when equalizing capital support for several reasons. First, districts that received FCA funds in 2018-19 have low taxable value per student and so will receive more in additional capital funding than they lose from elimination of the FCA. Second, differences across districts in FEFP funding exist to redress inequities due to cost differences. The FCA undoes that adjustment, undermining the central purpose of the FEFP and making resources less uniform. Third, some districts must be below average unless all districts are identical. The logical end of adjustments like the FCA is to undo all the cost adjustments in the FEFP. Thus, the FCA is antithetical to the constitutional requirement for resource uniformity. To maintain state revenue neutrality in the hypothetical calculation, each district's operating state funding, actual 2018-19 FEFP funds plus the two categorical programs and less the FCA, is scaled up or down proportionately until state funding is unchanged. In this case, it is increased by 0.4% to absorb reallocated FCA funds not needed to meet the 90% RLE cap.

To measure the impacts of equalization, we require a baseline against which to compare the hypothetical allocation. The baseline is almost, but not exactly, actual 2018-2019 funding. Two small changes are made to make the baseline represent a typical year, not a specific year that might reflect unusual variations. First, CO&DS and PECO funds are all allocated proportional to student counts to represent what is sustainable on average, not what happened to be allocated in a specific

year. Second, for almost all districts, the local discretionary capital millage is set to the 1.5 mill cap. As discussed elsewhere, this is almost always true in fact, but a few districts levy less in some years. However, some of the most property rich districts routinely levy less than the full 1.5 mills and, because they are property rich, the difference can be important. We therefore set the millage rate equal to its average over 2014-15 through 2018-19 in the six districts with the highest taxable value per student, which tend to be the districts impacted most by the 90% cap. Again, these are Collier, Franklin, Monroe, Sarasota, Sumter, and Walton, and their average millage rates for those 4 years were 1.444, 1.0, 0.5, 1.5, 1.393, and 1.393, respectively.

Figure 27 shows the percentage change in the sum of FEFP and capital funding plotted against taxable value per student adjusted for relative differences in appraisals relative to market values. Capital equalization moves funding from districts with higher taxable value per student, like Collier, Franklin, Palm Beach, Sarasota, Sumter, or Walton, to districts with lower taxable value per student but without the benefit of low capital cost, like Broward, Duval, Hillsborough, Osceola, and Pasco. Many small counties with low taxable value per student gain, like Baker, Holmes, or Union, but have little impact on total funding in the state due to their size. Again, the results for individual districts should not be taken as precise estimates, but the overall pattern and magnitude of the impacts are meaningful.

*Figure 27*

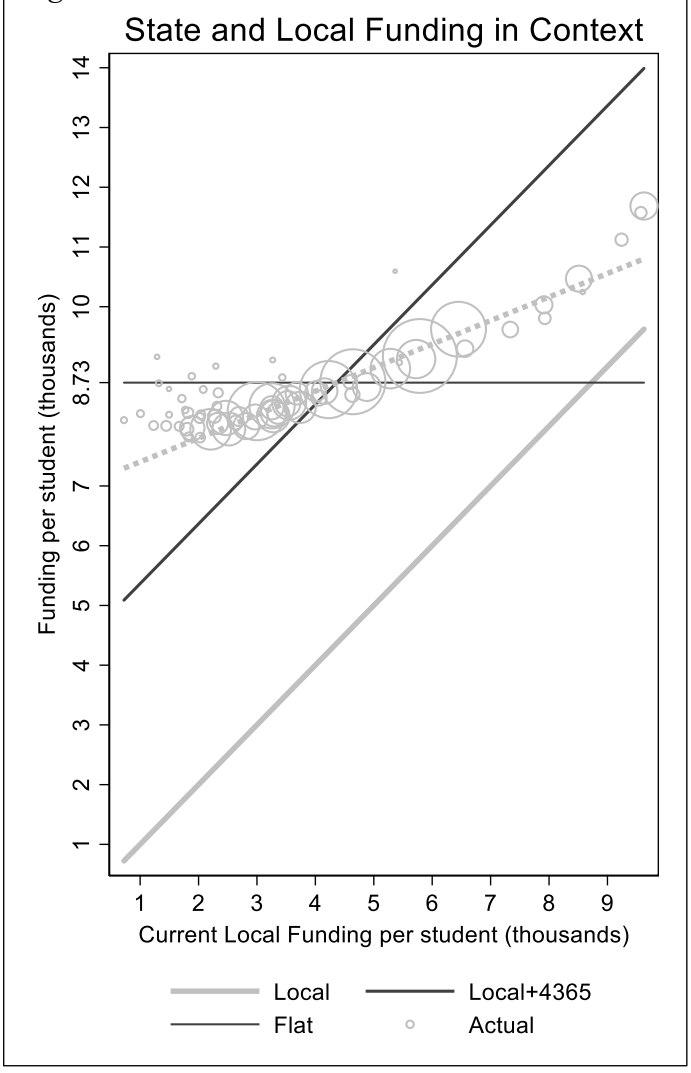



- *Revenue neutral capital equalization moves funding from districts with high taxable value (per student) to districts with low taxable value and to districts with moderate taxable value but relatively high capital cost.*

### 11.5 Capital Equalization in the Context of Total State and Local Finding

Each district's state and local funding is determined through an involved series of calculations. Because of the length of the calculation, some may think of Florida's funding system, which has existed in something very similar to its current form for half a century, as a complex and opaque anachronism. Yet each part of the calculation is simple to follow, and it is described and illustrated clearly in the Florida Department of Education publication *Funding for Florida School Districts*. In this section we consider the impact of capital in the context of the rest of Florida's funding system, providing a framework to think about equity and adequacy.

*Figure 28*




We do so by placing the impact of capital equalization on the system in one diagram. We build up to that diagram in two steps, the first of which is Figure 28. The figure represents the major aspects of Florida's current allocation mechanism. The first element makes provision for, and places limits upon, locally raised funding. The horizontal axis corresponds to local funding per student. This is comprises RLE for operating purposes in the FEFP, local discretionary capital funding, and local discretionary operating funding. The 45-degree line shows what per student funding would be if each district's funding equaled this local revenue. In Collier, the highest district, funding would be $9,625 and in Monroe, the second highest, it would be $9,572. The lowest two districts are Union at $723 and Holmes at $1,005. We consider it self-evident that, if this were the extent of funding, it would be neither equitable nor adequate. Inequitable because the low end is so low compared to the high end, and inadequate because the low end is so low.

The second major element of Florida's education finance system is the augmentation of local funding with state funding, by $4,365 per student in our baseline. The line with the same slope as the 45-degree line, but shifted up, shows locally raised revenue per student plus $4,365 in state funding. This would be the result if state funds were allocated proportional to enrollment. We take it as self-evident that this allocation would be inequitable. Whether it is adequate to meet the minimum needs in the lowest funded districts is not immediately obvious.

To put adequacy in the districts with the least funding were state funds allocated proportional to enrollment in perspective, funding in Union County would be $5,088. Florida's class size amendment limits class sizes to at most 18 prior to grade 3, 22 in grades 4-8, and 25 in grades 9-12. Let us use 20 as a representative class size for illustration. The average teacher salary in Florida in 2018-2019 was just under $50,000.[89] With benefits and other non-salary costs, paying the teacher alone will take around $60,000, or $3,000 per student, even in a county where average salaries are a bit lower. Non-labor operating costs are around one fifth of the total, as discussed earlier, implying operating costs associated with the school and classroom are 25% higher, or something over $3,750 per student. We estimated in section 5 that the annual cost to meet minimum capital standards is $2,495, bringing the total to at least $6,245. This is before making any allowance for things such as transportation costs or district support services.

A full and detailed accounting of the cost of all items needed to provide minimum per student support is beyond our scope. The point is simply that $5,088 is inadequate to cover the minimum necessities. So, this hypothetical allocation, in which state dollars are distributed on a constant per student basis to supplement local dollars, is inequitable and is also inadequate in the districts with the least funding per student.

The third major element of Florida's funding system adjusts for differences in taxable value per student, directly addressing equity. As a first approximation of this, imagine treating the property tax base as a state resource and allocating all funding on a constant per student basis. Local funding per student is $4,365, which added to state funding per student of $4,365 (it is coincidental that the two are the same) makes total state and local funding per student $8,730. The horizontal line in the figure represents this hypothetical flat allocation of $8,730 per student.

Whether or not this flat allocation would be adequate is a matter over which reasonable individuals might disagree. While we established above that the funding currently allocated for capital is insufficient to sustain capital at the minimum standard in and of itself, it is possible that operating funding may exceed the minimum level, so that the combined annual allocation might be enough. Determining that would take a detailed study of the cost of meeting some set of given minimum standards for the day-to-day operation of Florida's schools.

While dollars are allocated exactly equally per student in this flat allocation, it is still inequitable. Understanding this is the basis for understanding much about the further adjustments in the FEFP. Horizontal equity is about a given type of student having access to the same level of educational service regardless of their location. Dollars do not translate one-to-one to resources devoted to providing that level of service because prices, particularly wages and rents, vary from place to place. Moreover, resources required per student to achieve a given level of service vary with geography and other factors. For example class sizes may be smaller and miles of transport per student higher in sparsely populated districts.

The same factors that cause the tax base per student to vary district-to-district cause input prices and input requirements to vary. Prominent among such factors is population density. Higher population density is associated with higher labor and capital costs, and very low population density may be associated with higher per student input requirements. In this sense the flat line is

[89] Average teacher salary is available at https://www.fldoe.org/accountability/data-sys/edu-info-accountability-services/pk-12-public-school-data-pubs-reports/archive.stml.

inequitable for underlying reasons inextricably linked to the reasons the line representing $4,365 plus local revenue per student is inequitable.

- *Differences in local conditions drive differences that are simultaneously reflected in input costs, input requirements, and taxable value. Funding equalized in terms of dollars, not resources, to account for differences in the tax base, is inequitable due to the same underlying reasons funding with no adjustment for differences in the tax base is inequitable.*

The gray circles plotted in Figure 28 correspond to total of state and local funding in our baseline calculation. The area of the circles is proportional to district enrollment. The dashed gray line is a linear measure of the central tendency of total funding conditional on local funding, weighted by enrollment. State and local funding is on average $7,010 (*SE*=68.4) plus 0.394 (*SE*=0.015) multiplied by local funding. This equation captures 92% of the variation in state and local funding from the student, not district, perspective. Likely more useful for our purpose, state funding is $7,010 minus 0.606 multiplied by local funding, and this equation captures 96% of the variation in state funding from the student perspective.

To a good first approximation, state funding is $7,010 less 60.6 cents per dollar of local funding. For some purposes one might argue that the rest is just minor details. For other purposes those details may matter a great deal. The points in Figure 28 differ from the flat allocation for five specific kinds of reasons. First, the FEFP adjusts operating funding for various cost differences, e.g., labor costs, program costs, and costs due to sparsity, not just for differences in taxable value per student. Second, the legislature makes adjustments for its own specific purposes, for example the Safe Schools allocation and the Reading Program allocation. Third, the constraint that state funding must account for at least 10% of FEFP funding. Fourth, districts are allowed to levy up to 0.748 mills of discretionary operating millage, which is partly, but not fully, equalized by the state. Fifth, and central to this report, capital funding is not equalized and consists mostly of local revenue that varies with taxable value per student.

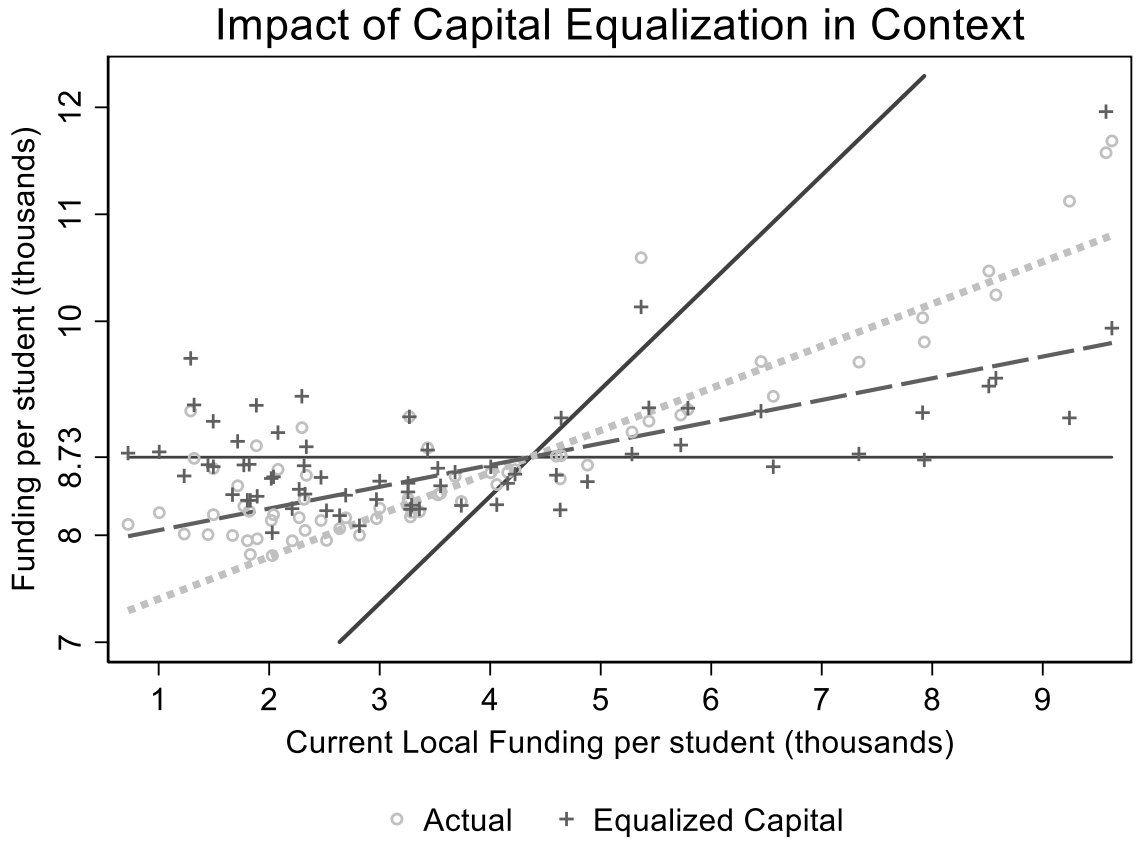
- *To a good first approximation, state funding is $7,010 less 60.6 cents per dollar of local funding. Actual funding differs from this approximation due to adjustments for cost drivers, other legislative priorities, the 90% RLE cap, local discretionary operating revenue, and inequitable capital funding.*

Figure 29 adds the allocation after capital equalization, marked by +, with the student weighted central tendency shown by the dashed black line. Compared to the previous figure, the region around actual and equalized funding is expanded, since depicting the impact of equalization is the purpose of this new figure. Capital equalization tends to increase funding in districts where local funding is low and to decrease it where local funding is high. The one exception is Monroe County. From 2014-15 through 2018-19 Monroe levied only 0.5 discretionary capital mills, far below the cap. Further, capital cost is quite high in Monroe. Thus, providing capital at the state average level, which reflects 1.5 mills of local revenue plus some state revenue, adjusted for Monroe's high capital cost, results in more funding.

After capital equalization, state funding declines more rapidly as local funding increases. On average state and local funding is $7,821 (*SE*=83.9) plus 0.208 (*SE*=0.018) multiplied by local funding. (The trendline shown is slightly different, since the plot is against baseline local revenue, not local revenue in the alternative, but the difference is negligible). This equation captures 67%

of the variation in state and local funding from the student perspective. On average state funding is $7,821 minus 0.792 multiplied by local funding. This equation captures 97% of the variation in state funding from the student perspective.

*Figure 29*




Comparing the two lines representing the central tendencies of funding under current practice and funding with equalized capital, the relationship between funding and the ability to raise money locally is much weaker once capital is equalized. Most of what remains reflects local discretionary operating funding, which of course is proportional to taxable value per student since almost all districts are always at the discretionary millage cap. Beyond that, some of it reflects correlation between the tax base and the cost drivers that state funding adjusts for, e.g., we saw earlier that capital costs are positively correlated with taxable value. Careful consideration of the figure makes clear that capital equalization has a substantial impact on equity.

- *Without equalizing capital funding, state funding per student in 2018-19 is $7,010 less 60.6 cents per dollar of local funding. After revenue neutral equalization of capital funding, state funding per student is $7,821 less 79.2 cents per dollar of local funding. Redressing inequity in capital support has major implications for the overall system of state and local funding.*

# 12. Redressing Inadequacy and Inequity

In section 8, we demonstrated that regular recurring capital revenue was $1,207 per student less than needed to sustain capital at state standards in 2018-19. To sustain adequacy, it is also necessary to replace the eroding sources of the CO&DS and PECO revenue streams. In total, $3.7 billion in additional broad-based revenue was needed as of 2018-19. While either the property tax or the sales tax might support that amount of revenue, we argued that it is far more efficient to use the sales tax. Raising the full amount as additional revenue would require increasing the sales tax rate from 6% to nearly 7%. Of course, if the tax base were broadened, the rate would not need to increase as much, and it is also possible to reallocate revenue from other uses.

In sections 9 and 10 we demonstrated that there was considerable inequity in capital funding. In section 11 we demonstrated that that inequity could be corrected by including capital funding in the framework of the existing FEFP without increasing funding. However, correcting the inequity in capital funding without increasing funding means some districts would receive considerably less funding since others would receive more.

We now consider the impact of simultaneously addressing adequacy and equity by hypothetically committing additional state sources to the 2018-19 FEFP and including regular recurring capital funding sufficient to sustain capital services at the state standard, $2,495 per student, as a component of FEFP funding. We continue to treat the Class Size Reduction appropriation, District Discretionary Lottery and Florida School Recognition Program funds, and what we have termed the Regular Discretionary Legislative Allocation as FEFP funds and to remove the Funding Compression Allocation. The results are depicted in Figure 30, which shows the percentage change in funding relative to the baseline from the previous section. Funding increases almost everywhere due to the large increase in state funding to sustain adequate capital.

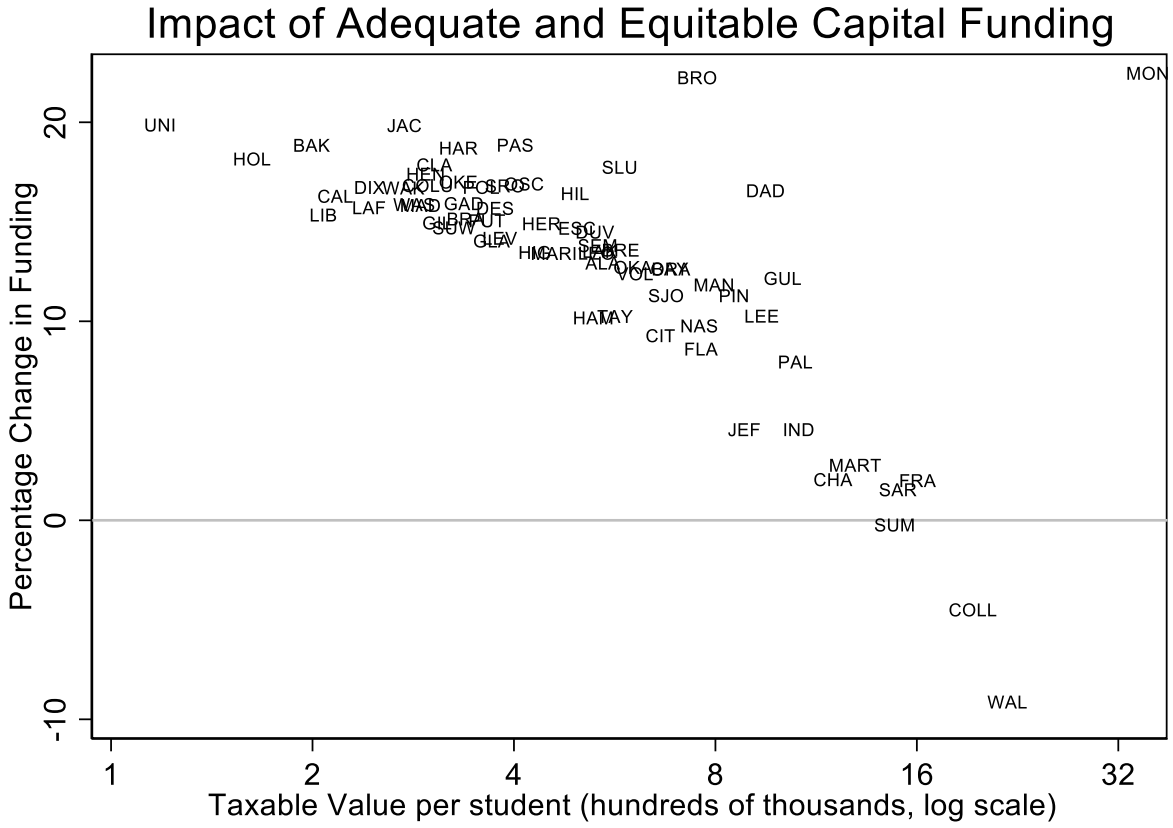
Some districts gain more than others. Monroe gains a lot, but that is because they have levied far less than the maximum capital millage in the past. Large gains occur where taxable value per student is very low even though capital costs are low, for example Union and Jackson. Broward gains a lot due to its combination of moderate taxable value per student and high capital cost. In general, the lower taxable value per student or the higher capital costs, the more the district gains.

Despite the large increase in state funding, funding declines notably in two of the most capital rich districts. Collier and Walton decline by 4.48% and 9.12% respectively. This occurs because both have made full, or nearly full, use of local capital millage applied to their high taxable value, and so have had recurring funding sufficient to sustain capital services above the estimate of what is needed to sustain capital standards. Sumter declines as well, but only by 0.22%.

- *If state funding is added to bring capital funding to the minimum adequate to sustain capital standards, equity can be achieved with a slight modification of the FEFP. Almost all districts gain funding while only two, among the richest in taxable value per student, lose funding.*

The distribution of local school taxes changes somewhat since more state funding is placed in the system and counted as part of the FEFP. Only five counties are at the 90% RLE cap under the alternative calculation with adequate and equitable capital funding. These are Collier, Franklin, Monroe, Sumter, and Walton. Sarasota hits the cap with the actual level of 2018-19 state FEFP funds, but not in this alternative. Moreover, tax rates are more equitable between the property rich

*Figure 30*




counties at the cap and the rest of the state when capital is adequately and equitably funded in this manner. In 2018-19 the average school millage rate in Collier, Franklin, Monroe, Sumter, and Walton, adjusting for appraisal ratios, was 4.478, while it was 6.109 elsewhere. In the alternative the average millage rate in the capped districts was 9.2% higher, at 4.89 mills, while it was 0.6% lower elsewhere, at 6.074 mills.

- *Adequately and equitably funding capital through the FEFP with a sufficient infusion of state funding reduces disparity on property tax rates and makes more efficient use of the property tax base.*

In section 11, we considered an alternative to 2018-19 baseline funding that would be equitable but revenue neutral. Above in this section we considered an alternative that both adds funding to achieve adequacy and reallocates funding to achieve equity. It is instructive to consider the relationship between state funding and local resources in each of these three scenarios for 2018-19, *Baseline*, *Equitable*, and *Adequate & Equitable*, and the way the funding mechanisms in the three scenarios compare to each other.

Let us consider a simple model of state funding that captures the vast majority of variation in funding between students across districts. Denote taxable value per student adjusted for differences in appraisal rations in hundreds of thousands of dollars and denote *ATVpsht*. Ignore, for now, factors such as adjustments for differences in input costs (e.g. the District Cost Differential

(DCD) and our capital cost index (CCI)) and per student input requirements (e.g. program cost factors and the sparsity adjustment). Having established a target for operating funding, baseline state operating funding adjusts one for one with required local effort, which rises proportionately with *ATVpsht*. Once the 90% FLE cap is hit, state FEFP funding is fixed at 10% of the target. Thus, state funding is linear in *ATVpsht* until the RLE cap binds and is constant thereafter.

This is only an approximation because of the adjustments to target funding. However, some of that variation is picked up by *ATVpsht* because, as we have seen in previous sections, taxable values are correlated with cost drivers. In fact, *ATCpsht* captures one third of the (student weighted) variation in the DCD and one-quarter of the (student weighted) variation in our CCI.

We estimate a student weighted regression model in which baseline state funding is a linear function of *ATVpsht* for non-capped districts and constant for capped districts. The regression gives expected state funding conditional on *ATVpsht*. The results are shown in the appropriate row of Table 6. Expected *Baseline* funding is $7,215 per student for a hypothetical district with no taxable value, falls $404 for every $100,000 of taxable value per student after adjustment for appraisal ratios, and is constant at $1,987 for districts at the RLE cap. This explains 98% of the variation in *Baseline* state funding between students across districts. This is a ***very good*** approximation of the way the state of Florida determines state aid to districts.

*Table 6*: 2018-19 State Funding Under Three Scenarios
(Student weighted expectation given adjusted taxable value per student in hundreds of thousands)

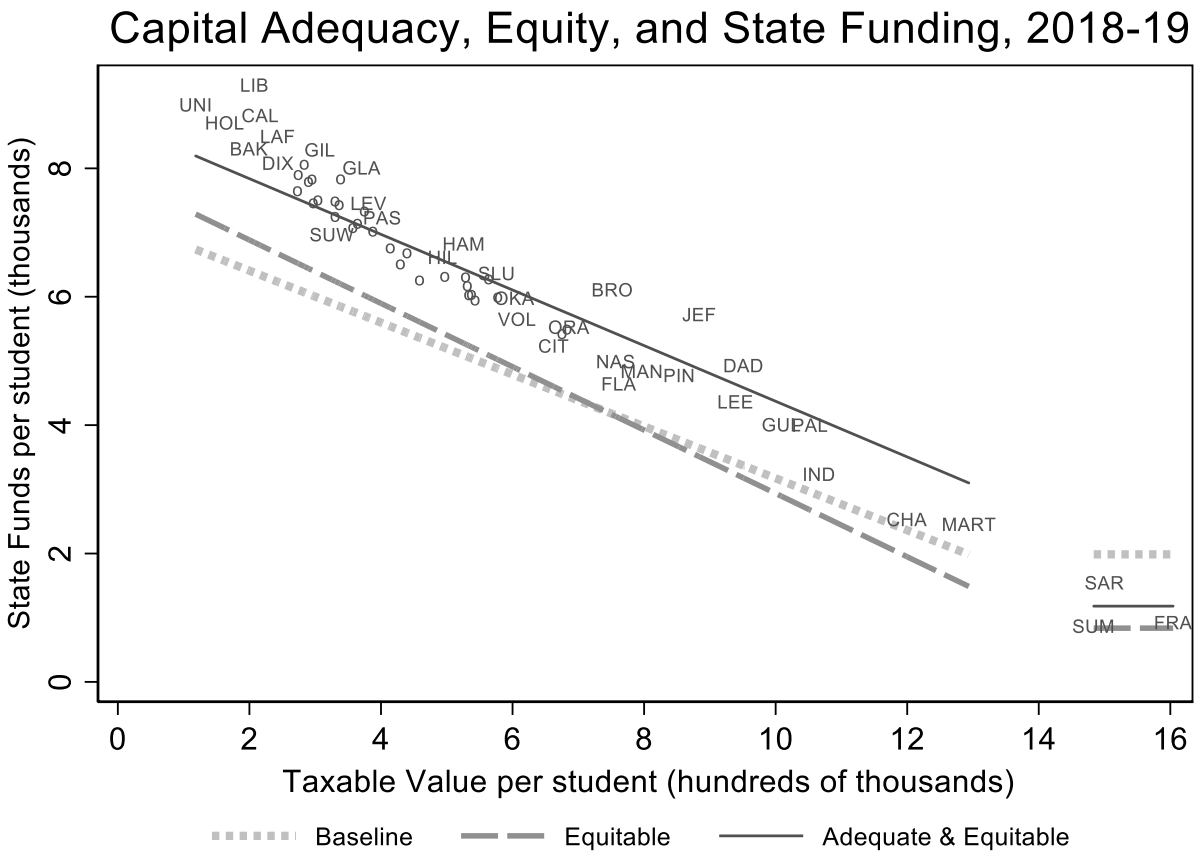
| | **State Funds per student** | | |
|---|---|---|---|
| **Scenario** | Non-capped Districts | Capped Districts | $\mathbf{R^2}$ |
| Baseline | 7,215 – 404×*ATVpsht*<br>(55) (8) | 1,987<br>(84) | 0.983 |
| Equitable | 7,871 – 493×*ATVpsht*<br>(84) (12) | 838<br>(129) | 0.975 |
| Adequate & Equitable | 8,706 – 433×*ATVpsht*<br>(137) (19) | 1,180<br>(211) | 0.938 |

Standard errors in parentheses.

We estimate corresponding models for the *Equitable* and *Adequate & Equitable* scenarios, the results of which are also shown in Table 6. To facilitate interpretation, the results are depicted graphically in Figure 31. The dotted gray line depicts the expectation for the *Baseline* scenario, the dashed dark grey line depicts the expectation for the revenue neutral *Equitable* scenario, and the solid black line depicts the expectation for the *Adequate & Equitable* scenario. The district labels or markers indicate positions of individual districts. The three most property rich districts, Walton, Collier, and Monroe, are off the chart to the right.

Compared to the *Baseline* scenario, state funding in the *Equitable* scenario is higher for property poor districts ($7,871 vs $7,215 if *ATVpsht* were 0), falls faster with increases in *ATVpsht* (decreasing at a rate of $493, and is considerably lower in the capital rich districts at the 90% RLE cap ($838 instead of $1,987). instead of $404). This approximation explains 98% of the variation in state funding per student.

*Figure 31*




State funding is higher in the *Adequate & Equitable* scenario than in the revenue neutral *Equitable* scenario ($8,706 vs $7,871 if *ATVpsht* were 0), declines more slowly with increases in *ATVpsht* (decreasing at a rate of $433 instead of $493), and increases modestly in the capital rich districts at the 90% cap ($1,180 vs $838). This approximation explains 94% of the variation in state funding per student.

The fact that state funding falls more slowly with *ATVpsht* in the *Adequate & Equitable* scenario than in the *Equitable* scenario may strike some, at least initially, as strange Is there something about the way state aid is allocated that increases resources to wealthier districts faster than it increases resources to poorer districts when state funding is increased? The answer is no, and simply noting the small increase in the most property rich districts, where the cap binds, should demonstrate this. So, what is going on? The slope reflets funding, not resources, and cost drivers tend to be higher where taxable value is higher, so that on average funding must be higher to achieve the same level of resources in wealthier districts.

Figure 31 sums up much of the content of this report. At present PK-12 capital funding is neither adequate to meet state standards nor equitable. It is possible to address equity without increasing funding by including capital funding in the existing system for determining education funding and state aid to local districts. This would result in a reallocation of state funding from districts with more local resources to districts with fewer local resources. Because it is a revenue

neutral reallocation, state support and total local and state support would fall in many districts. Inadequacy of capital funding could be addressed in two ways: reducing standards or increasing funding. If sufficient additional state funds were allocated to achieve adequacy along with equity, almost all districts would see a considerable increase in funding compared to the current baseline, both in terms of state aid to the local district and in terms of total state and local funding. Only the two most property rich districts would see total state and local funding fall appreciably.

Before leaving this discussion, we consider two somewhat common misconceptions about Florida's funding system in hopes of heading off confusion regarding the analysis herein. One is that some districts, donors, subsidize others, recipients. The second is that Florida's funding formula takes a reverse Robin-Hood approach, taking from poor districts to give to rich districts.[90]

The first is plainly untrue. All funds raised through the local property tax in a district are spent in that district, and every district receives some funding from state sources. This is guaranteed by the requirement that each district receive at least 10% of its total FEFP funding from the state. There simply are no donor districts, all are net recipients of state funds.

- *All districts are net recipients of state funds; there are no donor districts.*

The reverse Robin Hood claim, while also false, has more potential to obfuscate real issues due to its subtlety and the fact that it derives from taking the workings of some parts of the FEFP out of context. The FEFP adjusts for cost drivers which are positively correlated with taxable value. In this sense, some components of the FEFP send more money to richer districts. That is why when state funding is increased between the *Equitable* scenario and the *Adequate & Equitable* scenario in Figure 31 the line showing the relationship between state funding and the local taxable value becomes less steep. However, under a reverse Robin Hood allocation, the lines depicted in Figure 31 would, by definition, slope up, not down, yet state funding decreases as local resources increase. Indeed, the largest single function of the FEFP is to allocate more funding to poorer districts—that is to act as Robin Hood would. Moreover, the cost adjustments are inextricably linked with differences in the tax base. The goal is to equalize resources, not dollars, and costs are higher in the districts that receive more funding due to those adjustments. To ignore them would leave the districts with higher taxable value with lower resources per student.

- *The distribution of state funding to districts is strongly progressive. In 2018-19 state funding fell by approximately $4 for every $1,000 increase in taxable value per student.*

Though these claims are clearly false, and though some may make them or others like them disingenuously, it is easy to understand how some might put stock in them. As discussed above, one can make a reasonable case that Florida's schools are strapped for funding. Individuals in most districts probably feel they are not getting their fair share of funding, and therefore they may reasonably be critical of anything that seems to reduce funding for their district. This feeling may be exacerbated by the perception that the system is opaque, which discourages digging deeper.

[90] See for example the August 27, 2017 piece in the *The Daytona Beach News-Journal* by Volusia School Board chair Melody Johnson, "State's school funding process is a formula for failure," available at https://www.news-journalonline.com/opinion/20170827/melody-johnson-states-school-funding-process-is-formula-for-failure.

However, even if such erroneous claims are understandable and usually well intentioned, they deflect focus from two pressing issues. The first is whether $8,730 per student is adequate. Comparing sustainable capital funding to the state's capital standards suggests not, as does comparing funding in Florida to funding in other states or to past funding in Florida adjusted for demand and cost drivers. Ultimately, this is a political question, but framing it more clearly may help address it reasonably. The second is inequity in capital funding, which results in more resources in districts that are otherwise more fortunate than should be the case if equity (or uniformity) is an important goal. We have shown that both issues can be productively addressed, but they are less likely to be if we focus on phantom issues or draw false conclusions about the problems and their sources.

# 13. Conclusion

Florida's constitution makes providing for an adequate and equitable (uniform) system of free public schools a paramount duty of the state. Yet, while capital services are as necessary for a quality education as the services of teachers or other operating inputs, capital funding is neither adequate nor equitable.

We considered two forms of adequacy. First, whether capital funding is sufficient to sustain capital services at a level consistent with state standards. To make this determination, we used an optimal capital budgeting framework. This allowed us to calculate the minimum level of regularly recurring revenue, that is revenue that school districts can depend upon to provide capital services, necessary to meet any standard. We then compared regularly recuring revenue with the annualized cost of capital, based on the Florida Department of Education's estimate of the cost of constructing a student station up to state standards, along with other elements necessary to provide capital services, such as maintenance and repair. Second, we considered how capital funding compared to the past, after adjusting for factors that drive citizen demand for educational resources. These factors are inflation, real capital cost, real income, population, and enrollment. The investment in school capital made by Floridians today does not meet the standards of past Floridians.

Moreover, the current level of capital service is not sustainable given existing finance mechanisms. The revenues flowing into the Public Education and Capital Outlay (PECO) trust fund and the Capital Outlay and Debt Service (CO&DS) trust fund, which were significant sources of funding in the past, have eroded until they are of minor importance. There is no reason to think they will not continue to erode.

Ultimately, it is up to the legislature to provide funding it deems adequate. However, at present funding is insufficient to sustain the state's own estimate of the cost of standard capital. This imbalance might be dealt with by reducing the standards, for example weakening building codes, allocating less space per student station, or reducing safety and security requirements; by increasing funding; or by a combination of the two. If the imbalance is eliminated by providing additional funding, it would take a commitment of approximately $4.5 billion in additional broad-based funding that grows with income to sustain state standards as of 2023-24. As it happens, it would take an increase of a similar magnitude to fund capital at a level consistent with its funding level from the early 2000s, after adjustment for changes in demand drivers.

There are only two tax bases in Florida that are both broad-based and likely to grow in proportion to income—property values and taxable sales. However, property tax rates are already inefficiently high relative to the sales tax, and additional state revenue is also needed to address inequity. Thus, the only efficient way to increase revenue to fund adequate school capital, given current standards, is through increased reliance on sales tax revenue in the education budget. This might come from reallocating funding form other priorities, broadening the sales tax base, or increase the sales tax rate. If the funding were raised by increasing the sales tax rate, it would take an increase from 6% to nearly 7%.

In addition to adequacy, we considered horizontal equity between students across districts. As the revenue streams that support the PECO and CO&DS have eroded, the lion's share of the burden of capital finance has come to fall on the local property tax. Not only is the local discretionary capital millage rate cap too low to provide adequate capital in most districts, but, heavy reliance on the property tax necessarily results in inequity across districts. This is because revenue per student raised from levying the maximum millage rate, as almost all districts do each

year, is equal to taxable value per capita divided by both students per capita and the cost of capital, and all three factors vary considerably from district to district.

Students that happen to attend capital rich districts, with some combination of high taxable value per capita, few students per capita, or low capital cost, receive far more capital support than do students in capital poor districts. While once the state might have used PECO and CO&DS funds to offset the imbalance in local support, they are now so small that they cannot put a noticeable dent in the capital inequity. The inequity in capital funding exacerbates the adequacy problem as well. Even if capital support were adequate for the average school, inequity means that it would be inadequate in schools with less than average capital support.

The problems are further compounded by charter schools, formally as much a part of the public school system as traditional public schools. Traditional public schools receive more capital support than charter schools within districts. This of course means capital is even more inadequately funded for charter schools. Real capital support for charter schools, as opposed to nominal funding, varies considerably across districts due to variation in the cost of capital. The disparity between capital support for traditional public schools and charter schools varies greatly across districts. Moreover, the capital support advantage for traditional public schools grows with the share of charter schools in district enrollment.

No way of funding education exists which will make everyone happy. Those who place a high value on education, and those with children or grandchildren in public schools, may want much more spending on education. Those who place less value on education, or who have no connection to Florida's public schools, may want less spending on education and lower taxes. Some may think it is the responsibility of the state not just to provide a rich opportunity for education, but to spend enough to overcome a lack of support from parents or a lack of effort on the part of students, while others may think the parents and students bear the responsibility for putting in effort if they want a quality education.

In such an environment, it is easy to imagine an imbalance growing and persisting between capital standards and capital funding. That is, it is easy to see how little political appetite might exist to reduce the standards we claim to hold for schools while simultaneously little appetite exists to increase public revenues as needed to meet those standards. The erosion of the PECO and CO&DS revenue streams adds to this more fundamental problem. Ultimately, no force may exist that puts sufficient pressure on the legislature to induce it to address the issue one way or the other. While an imbalance between capital standards and capital funding may seem to be bad policy, it might not be bad politics. It may make perfect sense to those in office to support high standards, but not matching funding, and let the backlog of deferred maintenance grow, expecting to have moved on before it is time to pay the piper.

If the legislature does not address the imbalance between capital standards and capital funding, whether the narrow question of capital adequacy is justiciable is an open question. However, there is no way to square the vast inequity in capital funding across districts with the constitutional requirement for uniformity. How such inequity has persisted when operating funding has long been equalized is an interesting question. We have no satisfactory answer, only the observation that it is likely related to three factors: differences in the nature of capital and operating inputs, the obscure nature of education funding mechanisms generally and capital funding mechanisms in particular, and a lack of political appetite to upset the status quo.

In light of the state's constitution, it seems likely that a redress of capital inequity may eventually be mandated by the courts. Fortunately, it is straightforward to do so by including capital funding within the current FEFP, which would require only a few minor adjustments. Moreover, we showed that this may be done in a revenue neutral way. Since charters are funded on a per student basis according to the FEFP funding for the district in which they are located, this would naturally redress issues associated with charter school capital funding as well.

However, when, and if, Florida does rectify capital inequity, doing so in a revenue neutral way means students in capital rich districts would receive considerably less total state and local support. Like the prospect of lowering standards or raising taxes, this might be politically unpalatable. If that is the case, addressing equity might itself create the additional impetus to provide adequate funding. As we demonstrated, both adequacy and equity may be addressed if sufficient additional state revenue is committed to fund capital adequately and sustainably within the framework of the FEFP. In doing so nearly all districts gain in terms of state funding and state and local funding combined. While the most property rich districts, those at the 90% cap on required local effort, would see their state funding fall, we find only two of these six districts would experience a decline in total state and local funding.

It is impossible to create a system of education finance that will make everyone happy. Yet, we can work to improve the system we have. Reforming the way capital is funded, so that capital funding is adequate in relation to the state's standards and equitably distributed across its diverse districts is a promising opportunity for such an improvement.

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