Scale vs. Spend: Supplementary Calculations

Cost-Effectiveness of School Choice vs. Increased Education Spending

Author: Patrick Graff, Ph.D., Senior Fellow, American Federation for Children

Date: February 2026

Version: 5.3

Summary

This workbook contains the supplementary calculations supporting the policy brief *Scale vs. Spend* (Graff, 2026). It computes the cost-effectiveness of Florida's Tax Credit Scholarship (FTC) program's competitive effects on public school achievement relative to the counterfactual of equivalent increases in per-pupil K-12 education spending. The primary analysis uses FL DOE enrollment data; a sensitivity check uses NCES enrollment data. The central finding is that scaling the FTC program produced competitive effects on public school student achievement that were, conservatively, **11 times more cost-effective** than equivalent increases in K-12 education spending for the same group of public school students over the same period of time.

Table of Contents

Sheet	Description
README	Overview, key definitions, data sources
FL DOE - Primary Analysis	Primary cost-effectiveness calculations (FL DOE enrollment)
NCES - Sensitivity Check	Sensitivity analysis (NCES enrollment)
Sources & Documentation	Full citations, URLs, methodological notes

Key Definitions

Parameter	Value	Source
Jackson & Mackevicius spending effect	0.0079 SD/$1,000/pupil/yr (2018$)	Jackson & Mackevicius (2024)
Figlio endpoint (Year 15)	0.166 SD (reading, Grades 3-8)	Figlio et al. (2023), Replication Package
% Public School Students in Schools Facing Above-Median Competition	55.8%	Figlio et al. (2023), Appendix Table A2
Percentile conversion	SD Effect Size x 37	von Hippel (2024)
Inflation base year	2018 dollars	BLS CPI-U, October of respective year

Primary Data Sources

All data used in this research synthesis are publicly available or are results published by other researchers in peer reviewed academic journals.

Source	Full Citation	URL / Access
FTC Scholarship Program Competitive Effects - Figlio et al. (2023)	Figlio, D. N., Hart, C. M. D., & Karbownik, K. (2023). Effects of Scaling Up Private School Choice Programs on Public School Students. AEJ: Economic Policy, 15(2), 225-264.	https://doi.org/10.1257/pol.20210710
Most Recent and Often Cited Meta-analysis of Increases in School Spending - Jackson & Mackevicius (2024)	Jackson, C. K., & Mackevicius, C. (2024). What Impacts Can We Expect from School Spending Policy? AEJ: Applied Economics, 16(1), 412-446.	https://doi.org/10.1257/app.20220279
FL DOE Enrollment (2002-03)	Enrollment count is from a nonpublic school report due to lack of historical data through FL DOE.	https://www.fldoe.org/core/fileparse.php/7562/urlt/03-04.pdf
FL DOE Enrollment (2003-04)	Enrollment count is from a public legislative report due to lack of historical data through FL DOE.	https://www.edr.state.fl.us/Content/special-research-projects/education/Characteristicsofstudents.pdf
FL DOE Enrollment (2004-05 to 2012-13)	Kids Count Data Center - Annie E. Casey Foundation - Provided by the Florida Policy Institute	https://datacenter.aecf.org/data/tables/5342-public-school-student-enrollment?loc=11&loct;=2#detailed/2/any/false/1654,1601,1526,1445,1250,1069,952,824,750,466/any/11865
FL DOE Enrollment (2013-14 to 2016-17)	Florida Department of Education, Fall Membership Survey.	https://www.fldoe.org/accountability/data-sys/edu-info-accountability-services/pk-12-public-school-data-pubs-reports/
NCES CCD (2002-03 to 2016-17)	NCES, Common Core of Data, 2003-2017.	https://nces.ed.gov/ccd/elsi/
BLS CPI-U	U.S. Bureau of Labor Statistics, Consumer Price Index - U, All Items [CPIAUCSL].	https://www.bls.gov/cpi/

FL DOE Enrollment - Primary Analysis

Section A: Annual Data

Year	Figlio Effect (SD)	FTC Funding (2018$)	PreK-12 Enroll.	K-12 Enroll. (No PreK)	CF #1: Per-Pupil Effect (All K-12)	K-12 Above-Med Enroll. (55.8%)	CF #2: Per-Pupil Effect (AM K-12)	Gr. 3-8 AM Enroll. (55.8%)	CF #3: Per-Pupil Effect (AM 3-8)	Infl. Adj. $1000 (2018)
2003	0.0000	$69.7M	2,541,814	2,537,519	0.0002	1,415,936	0.0004	653,508	0.0008	716.93
2004	-0.0118	$54.7M	2,598,231	2,593,841	0.0002	1,447,363	0.0003	668,013	0.0006	731.56
2005	0.0012	$48.6M	2,639,927	2,635,466	0.0001	1,470,590	0.0003	678,734	0.0006	754.89
2006	0.0338	$59.3M	2,669,565	2,665,054	0.0002	1,487,100	0.0003	686,354	0.0007	787.71
2007	0.0292	$74.3M	2,663,637	2,659,136	0.0002	1,483,798	0.0004	684,830	0.0009	797.99
2008	0.0391	$88.9M	2,653,377	2,648,894	0.0003	1,478,082	0.0005	682,192	0.0010	826.21
2009	0.0515	$103.5M	2,631,631	2,627,184	0.0003	1,465,969	0.0006	676,601	0.0012	856.41
2010	0.0810	$124.1M	2,635,115	2,630,663	0.0004	1,467,910	0.0007	677,496	0.0014	854.84
2011	0.0887	$149.7M	2,644,218	2,639,750	0.0004	1,472,980	0.0008	679,837	0.0017	864.86
2012	0.1077	$164.7M	2,668,155	2,663,647	0.0005	1,486,315	0.0009	685,991	0.0019	895.35
2013	0.1364	$226.3M	2,692,162	2,687,613	0.0007	1,499,688	0.0012	692,163	0.0026	914.71
2014	0.1546	$297.2M	2,720,796	2,716,199	0.0009	1,515,639	0.0015	699,525	0.0034	923.53
2015	0.1412	$367.3M	2,756,944	2,752,286	0.0011	1,535,775	0.0019	708,819	0.0041	938.90
2016	0.1669	$445.2M	2,792,234	2,787,516	0.0013	1,555,434	0.0023	717,892	0.0049	940.50
2017	0.1657	$564.1M	2,817,076	2,812,316	0.0016	1,569,272	0.0028	724,279	0.0062	955.89
TOTAL		**$2.84B**		**40,057,093**	**0.0082**	**22,351,857**	**0.0148**	**10,316,242**	**0.0320**	

Section B: Cost-Effectiveness Comparison

	Counterfactual #1: All K-12		Counterfactual #2: Above-Median K-12 (Preferred Specification)		Counterfactual #3: Above-Med. Gr. 3-8	
	FTC Scholarship	Counterfactual	FTC Scholarship	Counterfactual	FTC Scholarship	Counterfactual
Total Program Cost	$2.84B	$2.84B	$2.84B	$2.84B	$2.84B	$2.84B
Student-Years Impacted	40,057,093	40,057,093	22,351,857	22,351,857	10,316,242	10,316,242
Cost per Student/Year	$70.84	$70.84	$126.95	$126.95	$275.07	$275.07
Cumulative Impact (SD)	0.1657	0.0082	0.1657	0.0148	0.1657	0.0320
Impact (Percentile Pts)	6.1	0.3	6.1	0.5	6.1	1.2
EFFECTIVENESS MULTIPLIER		**20.1x**		**11.2x**		**5.2x**

Interpretation: FTC Scholarship competitive effect (0.1657 SD = 6.1 pp, 15 years) was 20.1x (all K-12), 11.2x (above-median K-12), 5.2x (above-median G3-8) more cost-effective than equivalent spending increases.

Section C: Assumptions & Notes

#	Assumption	Details & Justification
1	Jackson & Mackevicius Spending Effect	0.0079 SD per $1,000/pupil/year (2018$). Jackson & Mackevicius (2024), Table 3.
2	Enrollment Denominator & Counterfactual	(CF1) If all K-12 (if public funding distributed to all K-12 students instead) (2) above-median K-12 , (3) above-median G3-8.
3	K-12 Calculation	Remove 2.2% of students each year - assumed to be in Public PreK. K-12 = (PreK-12 / 13.022) * 13.
4	Above-median Share	55.8% of K-12 = the percentage of students exposed to the 'treatment' of going to a school with above-median competitive pressure due to the FTC scholarship program, per Figlio et al. (2023), Online Appendix Table A2.
5	Grades 3-8 Share	Assumes uniform enrollment across grades = 6 of 13 K-12 grades. G3-8 AM = (AM K-12 / 13) * 6.
6	Inflation adj. $1000 (2018)	Uses October 2018 CPI-U (252.885) as the base year for all inflation calculations. The spending effect from Jackson & Mackevicius (2023) was calculated in 2018 dollars. Public school counterfactuals (CF) = 0.0079*FTC Scholarship Spending/(Enrollment*Inflation Adj. $).
7	Figlio Endpoint	Year 15 (2017) = 0.1657 SD. AM FTC exposure, reading, Grades 3-8, Table 4.
8	Percentile Conversion	SD Effect Size * 37 (.1 SD*37 = 3.7 percentile points)
9	Days of Learning Conversion	Assumes .25 SD of learning per school year (for 180 instructional days). My calculation assumes constant growth aross grade, though this is not true in reality - annual achievement growth varies considerably by grade. However, for the grade range I am most intersted in for this analysis (Grades 3-8), .25 is a commonly used measure of average annual growth (Bloom et al., 2008). Overall, this is an imprecise measure best used as a point of comparison with other interventions calculated in the same way.

NCES CCD Enrollment - Sensitivity Check

Section A: Annual Data

Year	Figlio Effect (SD)	FTC Funding (2018$)	PreK-12 Enroll.	K-12 Enroll. (No PreK)	CF #1: Per-Pupil Effect (All K-12)	K-12 Above-Med Enroll. (55.8%)	CF #2: Per-Pupil Effect (AM K-12)	Gr. 3-8 AM Enroll. (55.8%)	CF #3: Per-Pupil Effect (AM 3-8)	Infl. Adj. $1000 (2018)
2003	0.0000	$69.7M	2,539,929	2,535,637	0.0002	1,414,885	0.0004	653,024	0.0008	716.93
2004	-0.0118	$54.7M	2,587,628	2,583,256	0.0002	1,441,457	0.0003	665,287	0.0006	731.56
2005	0.0012	$48.6M	2,639,336	2,634,876	0.0001	1,470,261	0.0003	678,582	0.0006	754.89
2006	0.0338	$59.3M	2,675,024	2,670,504	0.0002	1,490,141	0.0003	687,757	0.0007	787.71
2007	0.0292	$74.3M	2,671,513	2,666,999	0.0002	1,488,185	0.0004	686,854	0.0009	797.99
2008	0.0391	$88.9M	2,666,811	2,662,305	0.0003	1,485,566	0.0005	685,646	0.0010	826.21
2009	0.0515	$103.5M	2,631,020	2,626,575	0.0003	1,465,628	0.0006	676,444	0.0012	856.41
2010	0.0810	$124.1M	2,634,522	2,630,071	0.0004	1,467,579	0.0007	677,344	0.0014	854.84
2011	0.0887	$149.7M	2,643,347	2,638,881	0.0004	1,472,495	0.0008	679,613	0.0017	864.86
2012	0.1077	$164.7M	2,668,156	2,663,648	0.0005	1,486,315	0.0009	685,991	0.0019	895.35
2013	0.1364	$226.3M	2,692,162	2,687,613	0.0007	1,499,688	0.0012	692,163	0.0026	914.71
2014	0.1546	$297.2M	2,720,744	2,716,147	0.0009	1,515,610	0.0015	699,512	0.0034	923.53
2015	0.1412	$367.3M	2,756,944	2,752,286	0.0011	1,535,775	0.0019	708,819	0.0041	938.90
2016	0.1669	$445.2M	2,792,234	2,787,516	0.0013	1,555,434	0.0023	717,892	0.0049	940.50
2017	0.1657	$564.1M	2,816,791	2,812,032	0.0016	1,569,113	0.0028	724,206	0.0062	955.89
TOTAL		**$2.84B**		**40,068,353**	**0.0082**	**22,358,140**	**0.0148**	**10,319,141**	**0.0320**	

Section B: Cost-Effectiveness Comparison

	Counterfactual #1: All K-12		Counterfactual #2: Above-Median K-12 (Preferred Specification)		Counterfactual #3: Above-Med. Gr. 3-8	
	FTC Scholarship	Counterfactual	FTC Scholarship	Counterfactual	FTC Scholarship	Counterfactual
Total Program Cost	$2.84B	$2.84B	$2.84B	$2.84B	$2.84B	$2.84B
Student-Years Impacted	40,068,353	40,068,353	22,358,140	22,358,140	10,319,141	10,319,141
Cost per Student/Year	$70.82	$70.82	$126.92	$126.92	$274.99	$274.99
Cumulative Impact (SD)	0.1657	0.0082	0.1657	0.0148	0.1657	0.0320
Impact (Percentile Pts)	6.1	0.3	6.1	0.5	6.1	1.2
EFFECTIVENESS MULTIPLIER		**20.1x**		**11.2x**		**5.2x**

Interpretation: FTC Scholarship Program competitive effect (0.1657 SD = 6.1 pp, 15 years) was 20.1x (all K-12), 11.2x (above-median K-12), 5.2x (above-median G3-8) more cost-effective than equivalent spending increases.

Section C: Assumptions & Notes

#	Assumption	Details & Justification
1	Jackson & Mackevicius Spending Effect	0.0079 SD per $1,000/pupil/year (2018$). Jackson & Mackevicius (2024), Table 3.
2	Enrollment Denominator & Counterfactual	(CF1) If all K-12 (if public funding distributed to all K-12 students instead) (2) above-median K-12 , (3) above-median G3-8.
3	K-12 Calculation	Remove 2.2% of students each year - assumed to be in Public PreK. K-12 = (PreK-12 / 13.022) * 13.
4	Above-median Share	55.8% of K-12 = the percentage of students exposed to the 'treatment' of going to a school with above-median competitive pressure due to the FTC scholarship program, per Figlio et al. (2023), Online Appendix Table A2.
5	Grades 3-8 Share	Assumes uniform enrollment across grades = 6 of 13 K-12 grades. G3-8 AM = (AM K-12 / 13) * 6.
6	Inflation adj. $1000 (2018)	Uses October 2018 CPI-U (252.885) as the base year for all inflation calculations. The spending effect from Jackson & Mackevicius (2023) was calculated in 2018 dollars. Public school counterfactuals (CF) = 0.0079*FTC Scholarship Spending/(Enrollment*Inflation Adj. $).
7	Figlio Endpoint	Year 15 (2017) = 0.1657 SD. AM FTC exposure, reading, Grades 3-8, Table 4.
8	Percentile Conversion	SD Effect Size * 37 (.1 SD*37 = 3.7 percentile points)
9	Days of Learning Conversion	Assumes .25 SD of learning per school year (for 180 instructional days). My calculation assumes constant growth across grade, though this is not true in reality - annual achievement growth varies considerably by grade. However, for the grade range I am most intersted in for this analysis (Grades 3-8), .25 is a commonly used measure of average annual growth (Bloom et al., 2008). Overall, this is an imprecise measure best used as a point of comparison with other interventions calculated in the same way.

Data Sources

Author did not create any new data of his own; all data gathered from existing sources mostly consisting of peer reviewed journals and government databases.

#	Source	Full Citation	URL / Access
1	FTC Scholarship Program Competitive Effects - Figlio et al. (2023)	Figlio, D. N., Hart, C. M. D., & Karbownik, K. (2023). Effects of Scaling Up Private School Choice Programs on Public School Students. AEJ: Economic Policy, 15(2), 225-264.	https://doi.org/10.1257/pol.20210710
2	Most Recent and Often Cited Meta-analysis of Increases in School Spending - Jackson & Mackevicius (2024)	Jackson, C. K., & Mackevicius, C. (2024). What Impacts Can We Expect from School Spending Policy? AEJ: Applied Economics, 16(1), 412-446.	https://doi.org/10.1257/app.20220279
3	FL DOE Enrollment (2002-03)	Enrollment count is from a nonpublic school report due to lack of historical data through FL DOE.	https://www.fldoe.org/core/fileparse.php/7562/urlt/03-04.pdf
4	FL DOE Enrollment (2003-04)	Enrollment count is from a public legislative report due to lack of historical data through FL DOE.	https://www.edr.state.fl.us/Content/special-research-projects/education/Characteristicsofstudents.pdf
5	FL DOE Enrollment (2004-05 to 2012-13)	Kids Count Data Center - Annie E. Casey Foundation - Provided by the Florida Policy Institute	https://datacenter.aecf.org/data/tables/5342-public-school-student-enrollment?loc=11&loct=2#detailed/2/any/false/1654,1601,1526,1445,1250,1069,952,824,750,466/any/11865
6	FL DOE Enrollment (2013-14 to 2016-17)	Florida Department of Education, Fall Membership Survey.	https://www.fldoe.org/accountability/data-sys/edu-info-accountability-services/pk-12-public-school-data-pubs-reports/
7	NCES CCD (2002-03 to 2016-17)	NCES, Common Core of Data, 2003-2017.	https://nces.ed.gov/ccd/elsi/
8	BLS CPI-U	U.S. Bureau of Labor Statistics, Consumer Price Index - U, All Items [CPIAUCSL].	https://www.bls.gov/cpi/