Bringing NY Foundation Aid into the Modern Era

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Overview

- **Issues with New York's Foundation Aid Formula**

- **Steps Forward**

- **Increasingly Common Ground in the Field**

- **Recent State Cost Analyses**

NY State Foundation Formula

- built on weak analyses that failed to accurately measure the costs of providing all children, especially those in higher poverty communities, with equal opportunity to obtain a meaningful high school education;
  - Base determined by weak, successful districts spending analysis, and adjusted by incorrect inflation factors
  - No empirical analyses behind weights for student needs

- never appropriately calibrated over time to account accurately for increased costs, including the costs associated with increased outcome goals and standards;

- never fully funded, with districts serving the highest need student populations having the largest shortfalls in funding with respect to what the formula demanded, on top of the fact that the formula calculations themselves were least sufficient for these same districts and children.

Example: Comparison to Alternative National Model Estimates

Figure 2

NECM Cost Estimates vs. Foundation Formula Funding

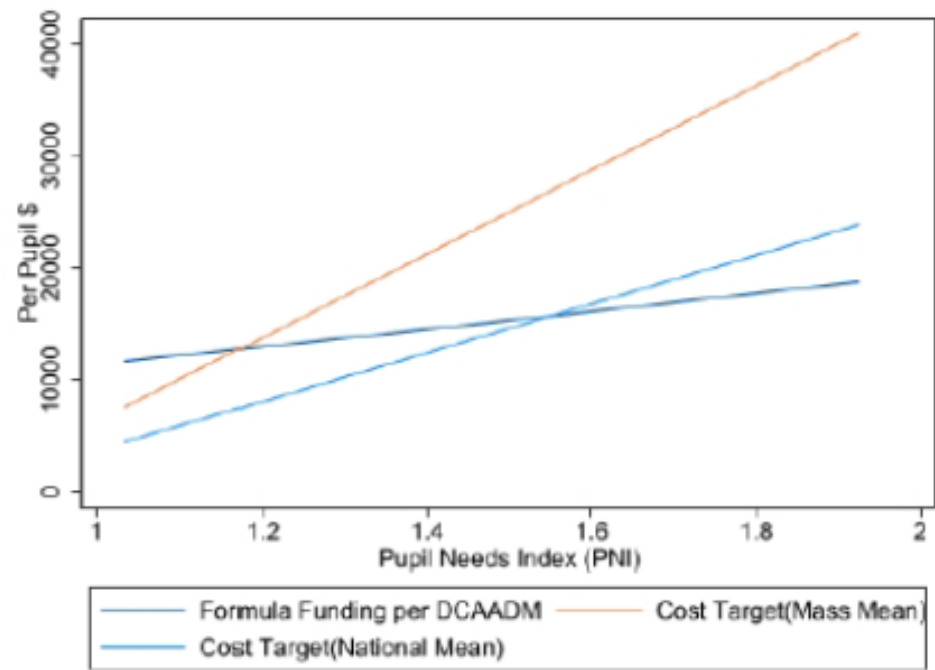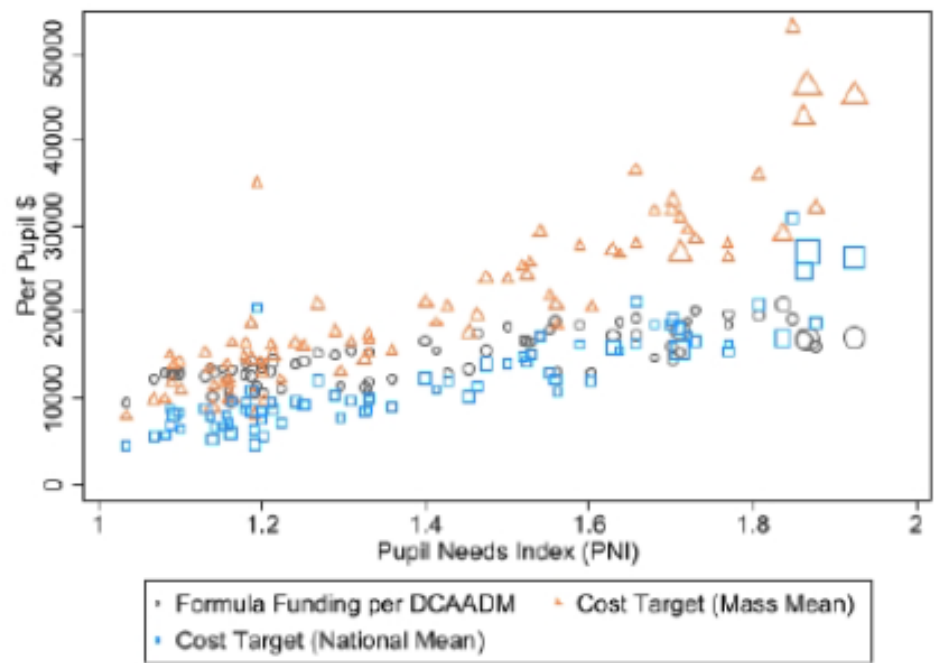Figure 2a   Figure 2b

Steps Forward

- Estimates via the most rigorous available methods, the costs per pupil for all New York children, wherever they reside or attend school, to strive for common, high, college and career readiness outcomes;
- Provides specific guidance on the translation of those cost estimates into a state school finance system for ensuring that all children in the state, wherever they reside or attend school, to strive for common, high, college and career readiness outcomes.

Cost Modeling to Inform State School Finance Policy

Calibrating School Funding by Linking Cost Analysis to Standards and Outcomes

Guiding principles

- It cost more to achieve higher and broader outcomes than to achiever lower and/or narrower outcomes

- It costs more to achieve a common set of outcomes for some children in some settings than for others

- State school finance systems should provide resources reasonably calculated for all children to achieve common, adequate educational outcomes

- Available empirical methods and data provide sufficient basis for calibrating both the levels and variations in school spending needed in order to provide all children equal educational opportunity.

Framing the problem/analyses

- It starts with setting outcome goals
  - Involving key constituents & with reference to constitutional demands
  - NOT with setting a desired spending level
    - that is determined by the outcome goals
  - The BIG and long term goals
    - Civic engagement / economic participation
    - College and Career Readiness
  - The short term, intermediate measures of progress toward those goals
    - state assessments, graduation rates, dropout rates
  - Setting specific standards using those intermediate measures
    - In collaboration between state officials & research team

Framing the problem/analyses

- Followed with empirical analyses/modeling
  - Determining the factors (and best measures of those factors) related to disparities in outcomes
    - **Needs/Risk Modeling**
  - Determining the factors related to variations in input prices and the costs of "doing business" from one location or context to the next (scale, wage variation, sparsity/remoteness)
    - **Needs/Risk Modeling**
  - Building/estimating data-driven (large data) models to project the spending needed to achieve common outcome targets across children and settings
    - **Cost Modeling**
  - Translating those models to "simpler" models using publicly accessible measures that can be used to drive an aid formula
    - **Weights Modeling**
  - Simulating policy implementation to approximate cost estimates
    - See New Hampshire

Introduction to cost analysis methodologies

- **Input Oriented** – Determine the personnel and non-personnel resources and corresponding costs associated with the educational services used to generate student outcomes. [Ingredients Method (Levin et al., 2018; Baker & Morphew, 2007)]
  - RCM or Ingredients methods
    - Existing resources
    - Proposed resources
      - expert/professional/constituent focus groups
      - In accordance with cost effective, researched interventions
  - Institutional production/delivery or student consumption
- **Outcome Oriented** – Evaluate aggregated spending per-student as a function of student outcomes and several cost factors including needs, labor price levels, scale of operations and other institutional characteristics. [Education Cost Function Analysis (Duncombe & Yinger, 2011; Levin et al., 2022)]

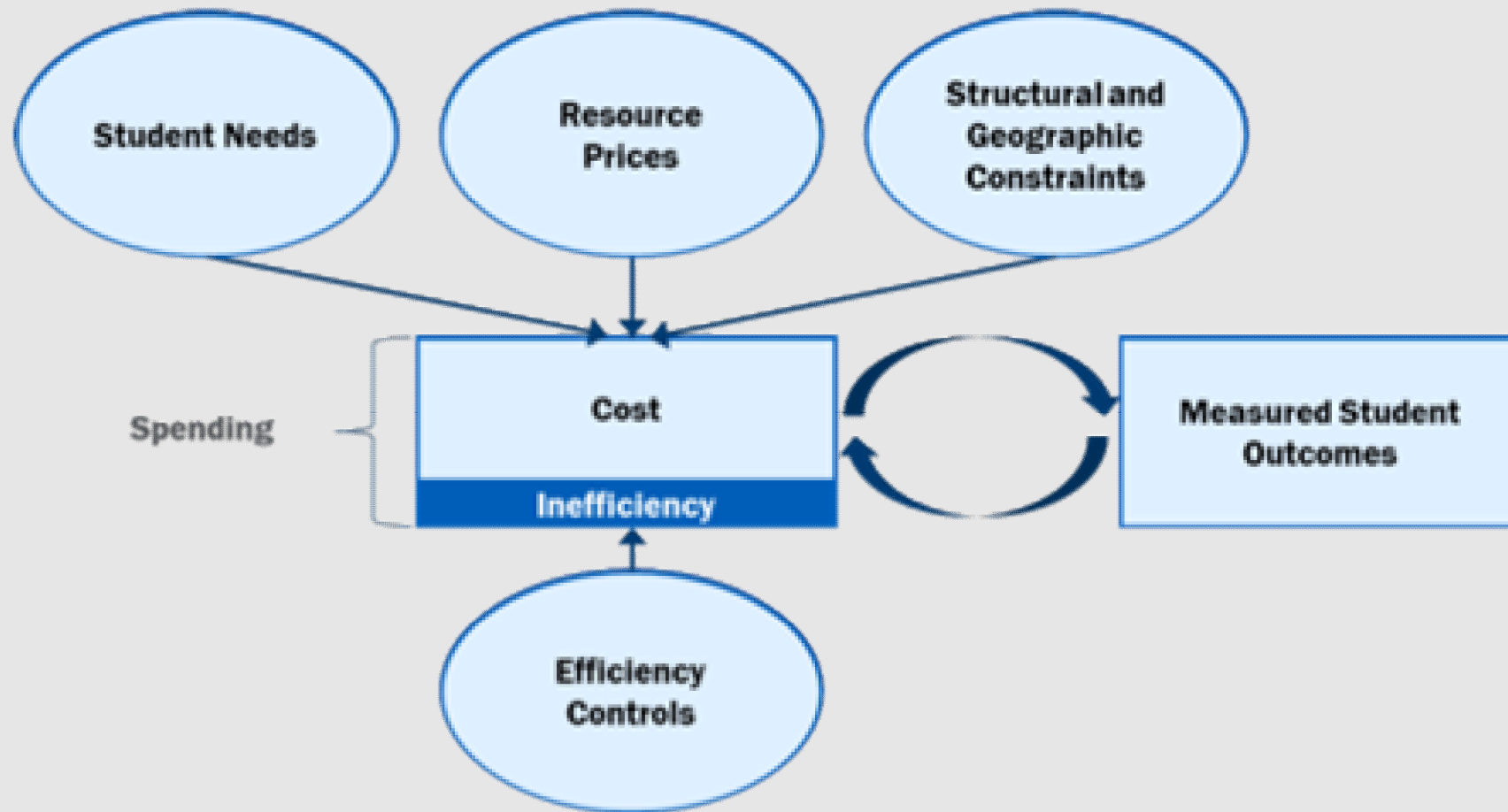# General Framework for Outcome Oriented Analysis
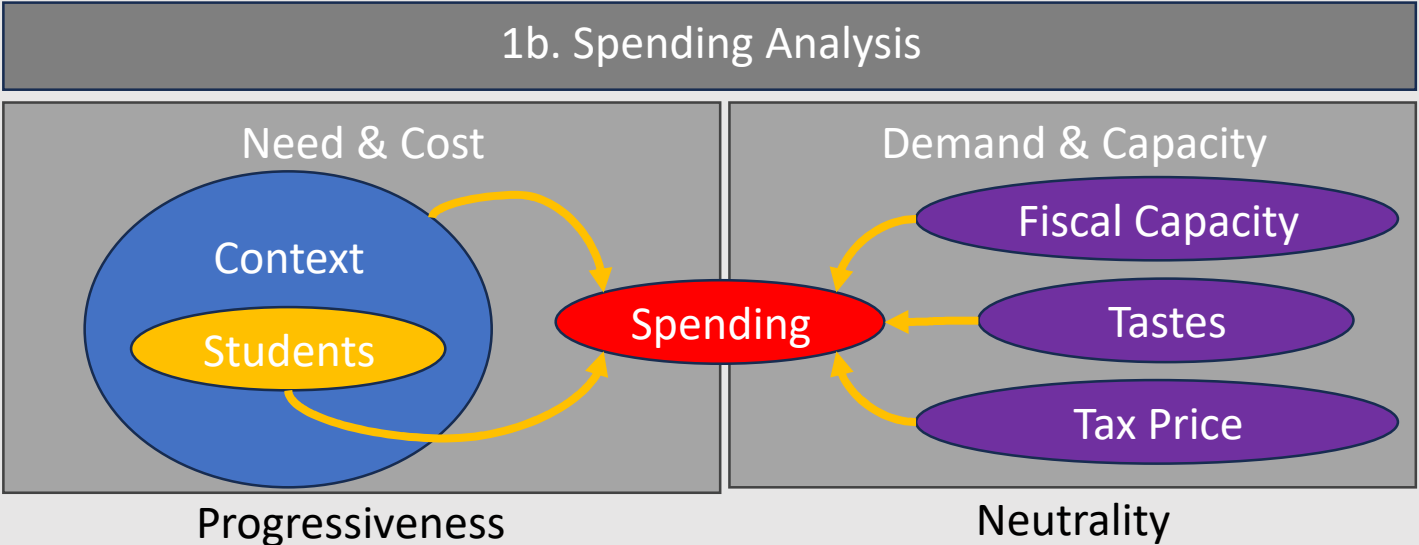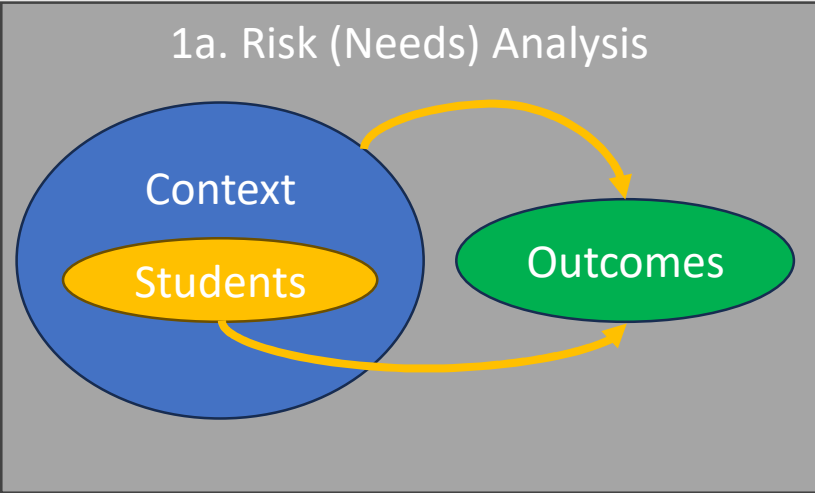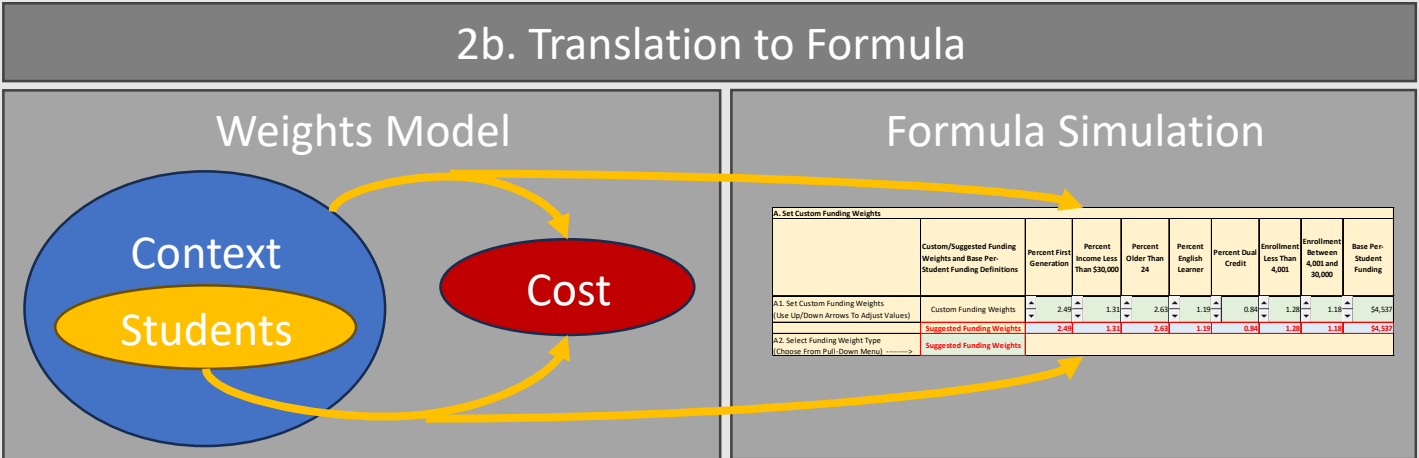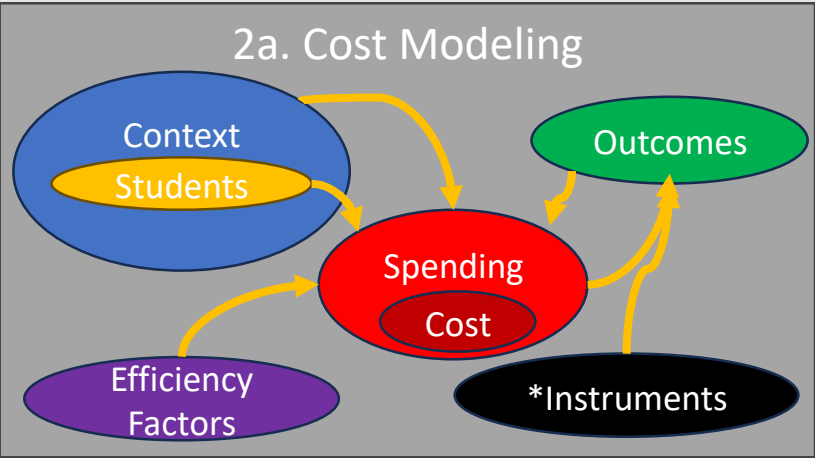
Illustration of outcome-oriented approach to cost analysis

From related work in Vermont (2018)

Figure 2.1. Factors Affecting the Costs of Achieving Common Outcome Goals

Individual Student "Risk" (where specific students require specific programs/services/ interventions)	Social Context of Schooling (collective student population has greater need)	Scale and Sparsity	Geographic Variation in Input Prices
Disability Status **English Language Learners** (Requires specific staff, with specific credentials to provide services children in need)	**Concentration of Economic Disadvantage** (Generally requires schoolwide supports involving additional staffing resources such as, expanded pre-k options, smaller class sizes, specific pupil-support staff, etc.)	**District and School Enrollment Size** (Affects required staffing ratios) **Grade Level** (Differences in academic and non-academic programming) **Population Sparsity** (Affects transportation costs) **Degree of Rurality** (Affects cost of providing specialized services)	**Employee Wages** (Wage required for recruiting and retaining comparably qualified teachers, administrators and other staff) **Non-Personnel Resources** (Includes contracted services, fuel and utilities, equipment, materials and supplies)

Note. Cost is the spending required, less inefficiency, to achieve any specific set of outcome goals

https://legislature.vermont.gov/assets/Legislative-Reports/edu-legislative-report-pupil-weighting-factors-2019.pdf

Recent State Applications of Cost Modeling

- VERMONT
    - Kolbe, T., Baker, B.D., Atchison, D., Levin, J. (2019) Pupil Weighting Factors Report. State of Vermont, House and Senate Committees on Education. https://legislature.vermont.gov/assets/Legislative-Reports/edu-legislative-report-pupil-weighting-factors-2019.pdf

- NEW HAMPSHIRE
    - Baker, B.D., Atchison, D., Levin, J., Kearns, C. (2020) New Hampshire Commission to Study School Funding, Final Report: https://carsey.unh.edu/sites/default/files/media/2020/09/20-12685_nh_final_report_version_v5_draft_1.pdf
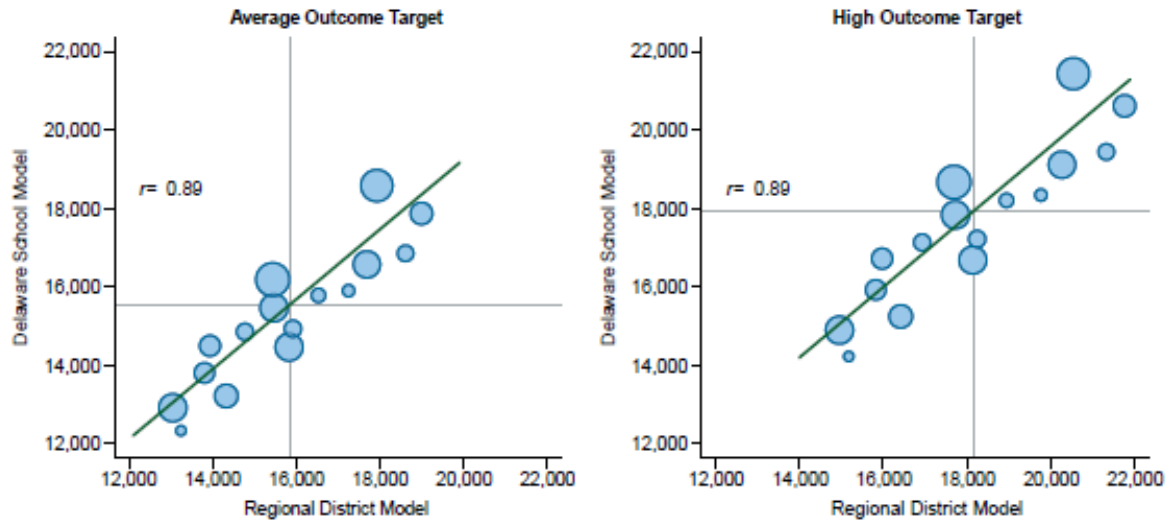
- DELAWARE
    - D. Atchison, B.D. Baker, J. Levin, S. Fatima, A. Trauth, A. Srikanth, C. Herberle, N. Gannon-Slater, L. Junk, K.: Wallace (2023) Assessment of Delaware Public School Funding. https://education.delaware.gov/wp-content/uploads/2023/12/23-22933_1_Delaware_Full_Report-FMT-ed103023-Version-2.pdf

- KANSAS
    - Taylor, L., Willis, J., Berg-Jacobson, A., Jaquet, K., & Caparas, R. (2018). Estimating the costs associated with reaching student achievement expectations for Kansas public education students: A cost function approach. San Francisco, CA: WestEd. Retrieved from https://probstforprogress.com/wp-content/uploads/2018/03/kansas_adequacy_study_cost_function_approach_20180315_final.pdf
    - Duncombe, W., Yinger, J. (2006) Estimating the Costs of Meeting Student Performance Outcomes Adopted by the Kansas State Board of Education. Prepared for the Kansas Legislative Division of Post Audit https://www.maxwell.syr.edu/uploadedFiles/cpr/research/cpr_research_education_finance_policy/Kansas_Report.pdf

Comparing National Model & State Specific Findings

Exhibit 46. Consistency of Cost Estimates from the Delaware and Regional Models (2019)

Note. For the Delaware model, we aggregate the school-level cost estimates to their districts to compare district average costs from the school-level Delaware-specific model (vertical axis) to district costs predicted by the regional model (horizontal axis). Figures and correlations include only the 16 geographically defined districts in Delaware. The enrollment-weighted correlation coefficient is represented by r. Calculations based on data from the Delaware Open Data Portal, Delaware Department of Education, U.S. Department of Education, and SEDA.

Exhibit 19. Comparison of Simulated Per-Pupil Costs in New Hampshire Districts From the New Hampshire and Regional Cost Models
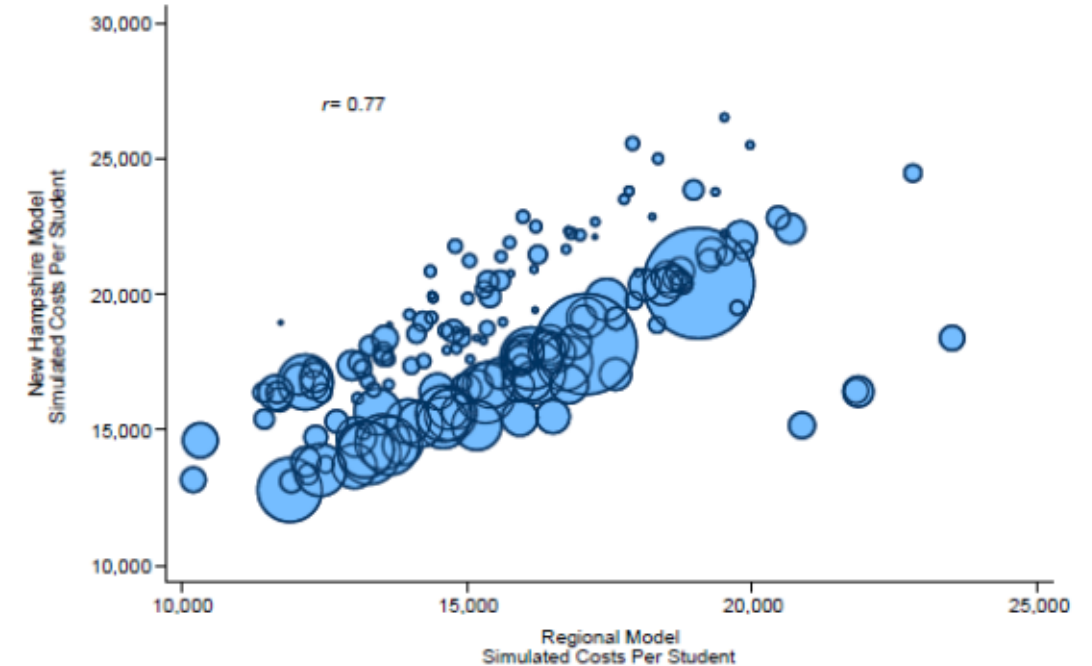
Outcome vs. Input Based Estimates (Delaware)

Exhibit 69. Comparing Simulated Funding per Student From the Education Cost Model and Professional Judgment Panel Approaches
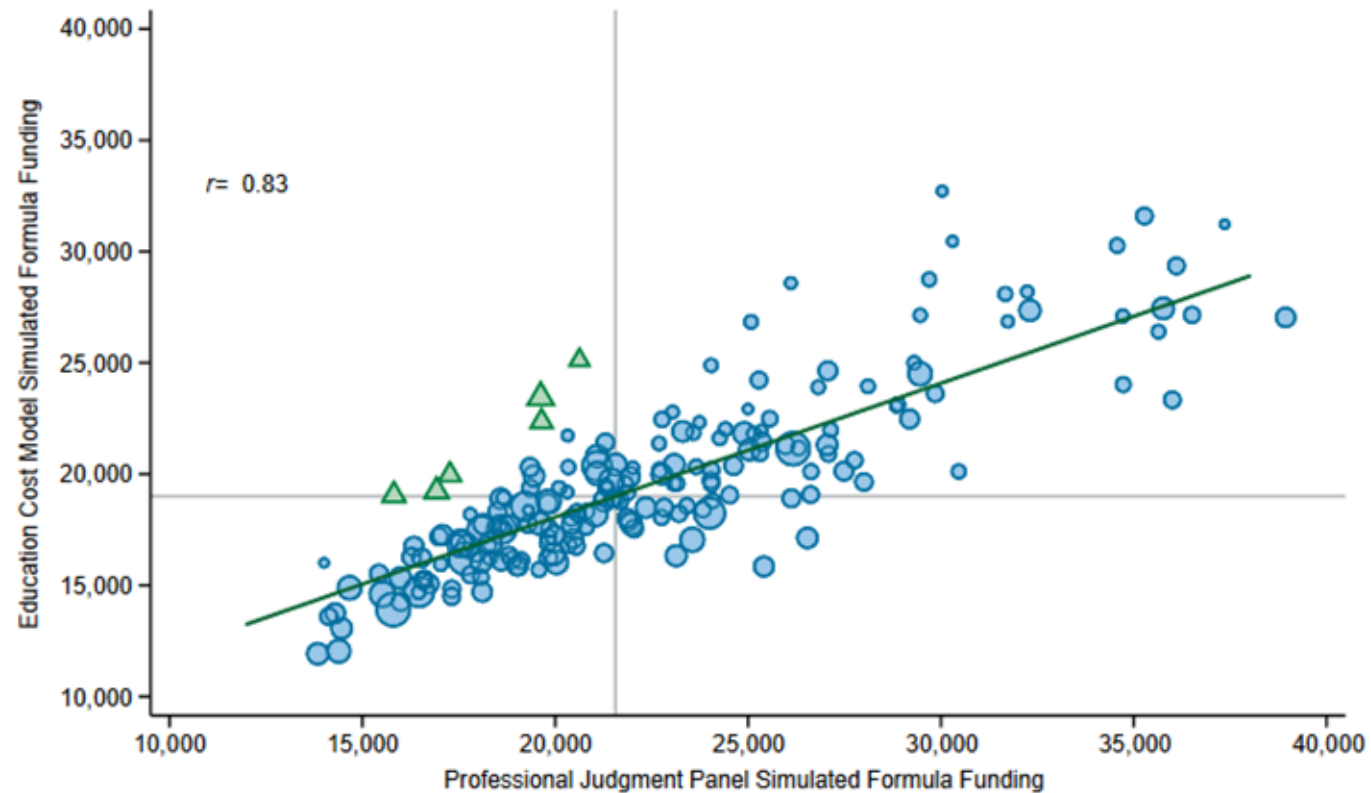
Thoughts for New York State

- Statewide model using past decade of data
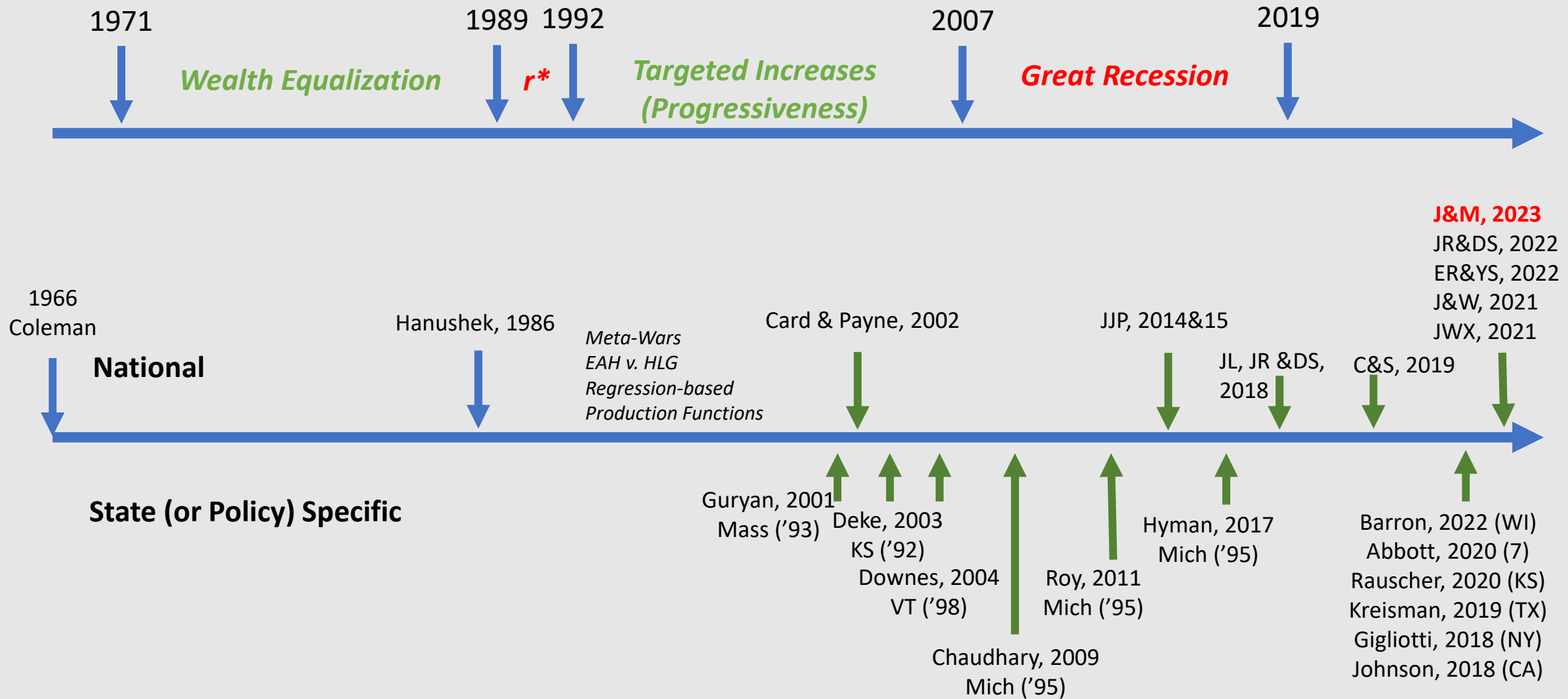 - New York data are of much higher quality and consistency than what we've been working with in VT, DE, NH.
    - District level model (the usual approach)
    - Supplemented with a school level model for NYC, across same years (to capture within NYC variation in costs across schools, and to reconcile summed school costs with statewide model, district cost estimates)
  - Costs can be estimated to alternative outcome goals (sensitivity analysis)
    - Both the levels set to those goals (proficiency rates, grad rates, etc.) and the range of goals included

- Resource analysis of schools more effectively reaching current standards
  - Note: this is NOT at all like "successful schools" or "beating the odds" analysis as commonly described. From the cost model itself, we can more precisely explore cost efficient producers of specific outcomes and do deeper dive into their resource use/organization, seeking patterns that might guide policy.
  - Can also be compared to professional/expert guidance on school/district resource allocation

Evolving Evidence on How and Why Money Matters

Evolving Research on "Money Matters"

- Since 1990s
  - More thorough annual state and federal collections of data in electronic formats with finer granularity (districts, schools & students)
  - But still early in process for finer grained data on student outcomes
- Since 2000s
  - Those panels of data grew longer, with added precision and greater harmonization across districts within states and eventually across states (in federal collections)
    - Thus capturing more "events" that might affect spending and in turn, outcomes
  - Advancements in statistical methods for evaluating the causal effects of those events on student outcomes.

School Funding Context

1971   1989   1992   2007   2019

Wealth Equalization   *r**   *Targeted Increases (Progressiveness)*   *Great Recession*

Research & Eval

J&M, 2023
JR&DS, 2022
ER&YS, 2022
J&W, 2021
JWX, 2021

1966
Coleman

National

Hanushek, 1986

Meta-Wars
EAH v. HLG
Regression-based
Production Functions

Card & Payne, 2002

JJP, 2014&15

JL, JR &DS, 2018

C&S, 2019

State (or Policy) Specific

Guryan, 2001
Mass ('93)

Deke, 2003
KS ('92)

Downes, 2004
VT ('98)

Chaudhary, 2009
Mich ('95)

Roy, 2011
Mich ('95)

Hyman, 2017
Mich ('95)

Barron, 2022 (WI)
Abbott, 2020 (7)
Rauscher, 2020 (KS)
Kreisman, 2019 (TX)
Gigliotti, 2018 (NY)
Johnson, 2018 (CA)

Cost Modeling, 1994

20

2023 Meta-Analysis of Causal Impacts

- Jackson, C. K., & Mackevicius, C. L. (2023). What impacts can we expect from school spending policy? Evidence from evaluations in the US. *American Economic Journal: Applied Economics*.
  - Identified 31 studies that met specific conditions as of December 1, 2020.
    - (a) employed quasi-random or quasi-experimental variation in school spending to estimate impacts on student outcomes, (b) demonstrated the spending variation was plausibly exogenous,1 and (c) demonstrated meaningful policy-induced variation in school spending.
    - Of 32 unique study-outcomes, 25 present estimates of test score impacts (either test scores or proficiency rates) and 12 present estimates of impacts on educational attainment (high school dropout, high school graduation, or college enrollment).6 The studies represent a range of estimation strategies and sources of variation.
    - 6 papers examine school finance reforms nationally, 7 examine particular state-level school finance reforms, 3 examine school spending referendum, 4 look at school improvement grants, 9 look at capital construction projects, and others identify effects of Title I or impacts of economic shocks on spending.
  - To facilitate direct comparison, for each study we constructed an estimate of the marginal policy-induced impact on standardized outcomes of exposure to a $1000 per-pupil spending increase (in 2018 dollars) over four years.
    - On average, a policy increasing spending by $1000 per-pupil for four years improves test scores by 0.0316σ and college-going by 2.8pp.
    - Marginal effects of capital spending are similar to non-capital, and effects are similar across baseline spending levels and geography.

Reconciling "Cost" modeling & causal effects

- Concept:
  - Outcomes = f(Spending, Context, Students)
  - Spending = f(Outcomes, Context, Students, **Inefficiency**)
    - Cost = Spending – Inefficiency (that portion we can predict)
- Cost model estimates generally find that it would cost less to achieve the same amount of gain in achievement than would be extrapolated from assuming that each additional $1,000 per pupil investment yields an additional .3 to .4 standard deviations in achievement gain.

Recent Peer Reviewed Cost Modeling Studies

- Baker, B. D., Weber, M., & Srikanth, A. (2021). Informing Federal School Finance Policy with Empirical Evidence. Journal of Education Finance, 47(1), 1-25.
- Levin, J., Baker, B., Lee, J., Atchison, D., & Kelchen, R. (2022). An Examination of the Costs of Texas Community Colleges. REL 2023-142. *Regional Educational Laboratory Southwest*.
- Kolbe, T., Baker, B. D., Atchison, D., Levin, J., & Harris, P. (2021). The additional cost of operating rural schools: Evidence from Vermont. *AERA Open*, *7*, 2332858420988868.
- Zhao, B. (2022). Estimating the cost function of Connecticut public K–12 education: implications for inequity and inadequacy in school spending. *Education Economics*, 1-32.
- Gronberg, T. J., Jansen, D. W., & Taylor, L. L. (2017). Are charters the best alternative? A cost frontier analysis of alternative education campuses in Texas. *Southern Economic Journal*, *83*(3), 721-743.