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METHODOLOGY AND DATA COMPANION

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The Lean Model: Orthodox Jewish Day School Economics

Methodology and data companion to the working paper

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A full white paper, with the complete introduction, related literature, data and design, results, discussion, limitations, conclusion, and references, is available on request.

At a glance	
Research question	Do Orthodox Jewish day schools run a structurally different financial model than non-Orthodox Jewish day schools that carry the same dual curriculum, and does any price gap sit in the list price or in discounting?
Data	Two benchmarking exports (a national independent-school platform and a Jewish day school network), 2022-23 to 2025-26, covering 101 Jewish day schools: 18 Orthodox and 83 non-Orthodox.
Unit of analysis	The school-year for the per-pupil outcomes, with repeated years nested inside each school; supplementary measures use one observation per school.
Statistical method	A hierarchical linear model, a multilevel regression carrying a school-level random intercept and adjusting for region, log enrollment, and year.
Headline finding	Orthodox schools collect 33.6% less net tuition per pupil and spend 32.1% less per pupil, with no philanthropy gap; the shortfall sits in the posted price, about a quarter lower, not in deeper discounting.
What it shows	The Orthodox day school model is lean rather than subsidized, running a materially lower cost base without an endowment cushion or a fundraising edge.

The question behind the paper

Jewish day schools run two curricula in one school day, general studies and Judaic studies, a structure widely assumed to carry a cost premium that should press hardest on Orthodox schools running the most intensive version of it. This paper tests that assumption by comparing Orthodox schools directly against other Jewish day schools rather than against the wider independent-school market, a design that holds the shared two-curriculum structure constant and isolates what is distinctively Orthodox about the economics. It then asks a sharper follow-up: if Orthodox schools collect a lower price, does that come from posting lower prices or from discounting ordinary ones more deeply?

Where the data come from

Two benchmarking exports. The analysis pools two sources for 2022-23 through 2025-26: a national independent-school benchmarking platform's PK-8 national exports and the PK-8 cohort exports of the network organization for Jewish day schools in North America. From these it draws the 101 schools classified as Jewish day schools, 83 non-Orthodox and 18 Orthodox, with most cohort assignments supplied by the network and 25 more classified by the author from published information. Non-Orthodox Jewish schools serve as the reference group throughout.

Four core per-pupil outcomes. The study constructs net tuition revenue per pupil (what families actually pay), operating expenses per pupil (the cost base), advancement revenue per

pupil (philanthropy), and full-time-equivalent staff per 100 students (the operational trace of the dual curriculum), after dropping 2022-23 for lack of an enrollment denominator and screening out impossible values.

Price and discount measures. Three thinner measures (sticker tuition, endowment per pupil, and class size) are added cross-sectionally, and full-day kindergarten tuition serves as an independent list-price check because every school reports it on a common basis. The tuition discount rate, which the platform's own aid categories do not populate for peer schools, is recovered directly as the gap between reported gross and net tuition revenue for 14 Orthodox and 62 non-Orthodox schools.

The statistical method, named and explained

The core tool is a hierarchical linear model, also called a multilevel or mixed-effects regression. Because the same school appears in several years, its observations are not independent, so the model gives each school its own random intercept and estimates the Orthodox effect from the variation that remains after that school-level clustering is accounted for. Each outcome is modeled on the log scale, so its coefficient reads as an approximate percentage difference, and the model adjusts for region, log enrollment, and year so that the comparison holds geography and school size constant rather than confounding them with denomination. Every core estimate is carried alongside a U.S.-only cut and a network-only cut as robustness checks. The thinner supplementary measures, resting on as few as 5 to 10 reporting Orthodox schools, are handled with cross-sectional regression backed by Mann-Whitney and permutation (randomization-inference) tests, the appropriate standard when a treated group is small.

Key results from the paper

Table 1. Orthodox versus non-Orthodox Jewish schools: core per-pupil outcomes.

Outcome	% effect	p	Schools (O/N)	Robustness (US-only / network-only)
Net tuition per pupil	-33.6%	0.0016	13 / 59	-37.7% (p=.002) / -35.1% (p=.001)
Operating expenses per pupil	-32.1%	0.0001	13 / 59	-39.1% (p<.001) / -33.0% (p<.001)
Advancement per pupil	-11.7%	0.622	11 / 61	-29.5% (p=.19) / -13.7% (p=.58)
FTEs per 100 students	-11.7%	0.099	12 / 63	-21.9% (p=.001) / -11.7% (p=.099)

Note. Effects are from the hierarchical model on the log scale, read as percentage differences from the non-Orthodox reference group.

Table 2. Supplementary outcomes (cross-sectional, one observation per school).

Outcome	Orthodox median (n)	Non-Orthodox median (n)	Mann-Whitney p	Adjusted effect (p)
Sticker list price (kindergarten check)	$16,860 (10)	$22,995 (63)	--	-25.7% (.027)
Endowment per pupil	$4,040 (7)	$11,700 (50)	0.078	-71.9% (.034)
Class size, K-5	19 (7)	14 (61)	0.142	+40.2% (.013)
Class size, 6-8	17 (5)	13 (51)	0.167	+29.3% (.183)

Note. The list-price row uses full-day kindergarten tuition, the one grade every school reports on a common basis; it tracks the Grade 1-12 weighted average almost exactly (r = 0.98) and survives randomization inference (permutation p = .036).

How to read the results

Table 1 carries the two most robust findings: Orthodox schools collect about a third less net tuition per pupil and spend about a third less per pupil, and both gaps hold across the U.S.-only and network-only cuts. Advancement revenue, by contrast, shows no reliable difference, so the

lower collected price is not explained by substituting communal giving for tuition. Table 2 then locates the price gap. Two independent measures, the Grade 1-12 sticker and the kindergarten list-price check, agree that Orthodox schools post prices roughly a quarter lower, and the near-absence of endowment (a median near $4,000 per pupil against $11,700) rules out accumulated reserves as the hidden subsidy. Measured directly, the two cohorts discount at rates this analysis cannot tell apart, so the shortfall is a list-price phenomenon; deep discounting itself turns out to be a sector-wide Jewish trait, with both cohorts discounting far more than the wider market.

What the numbers do not claim

The Orthodox cohort is 18 schools, so the core estimates carry wider confidence intervals than the larger reference group, and the supplementary measures, drawn from as few as 5 to 10 reporting schools, are best read as directional. The sample skews toward larger, Northeast- and Canada-concentrated, institutionally established Orthodox schools and underrepresents the Chassidic and Yeshiva World schools driving most recent enrollment growth, so the findings describe the benchmarked segment of the sector. The discount measure captures the size of the discount but not its composition, since need-based aid, merit awards, and remission are bundled in the net-revenue figure, and the discounting null means only that no difference between the two Jewish cohorts is established, not that none exists.

Reproducing the analysis

The study rests on two subscription benchmarking exports rather than open files, so exact replication requires access to those platforms, but the construction is fully specified. The four per-pupil outcomes, the recovered discount rate (gross tuition minus net tuition revenue), and the kindergarten list-price proxy are each defined from named reported fields, and the hierarchical model, the region and enrollment adjustments, and the U.S.-only and network-only robustness cuts are documented so the estimates can be rebuilt from the same school-year records.