Risk and Resources in Korean Public Schools

Which needs predict lower outcomes, and do teachers and school budgets follow them?

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Summary

This report applies the first step of the framework for evaluating and reforming education finance systems (Baker, Atchison & Levin, 2026) to the Republic of Korea, following parallel analyses of Mexico, Brazil and France. **Risk modeling** identifies which measurable characteristics of pupils and communities predict lower outcomes. **Resource modeling** asks whether resources are greater where those risks are concentrated, after accounting for cost factors that are not need, chiefly school size and remoteness. Korea pays teachers on a national salary scale, finances its 17 provincial and metropolitan offices of education mainly through a formula grant from national taxes, and publishes school-level staffing and school-account data for every school. The analysis covers about 9,905 public elementary, middle and general high schools enrolling 4.2 million pupils, from 2019 to 2025.

- **Korea's open data cannot measure achievement by school, so risk is measured through progression.** National assessment results have been sample-based since 2017 and are not published by school. The best available school-level outcome is where graduates go next. Among middle schools in the lowest tenth of need, 9% of graduates enter vocational high schools and 8% enter selective academic high schools; in the highest tenth, the figures are 21% and 0.8%. District income and the share of children in households outside regular employment together predict 24% of the out-of-sample variation in middle-school progression; adding school-level indicators raises this to 35%.
- **Immediate university entry is not a valid outcome measure.** General high schools in high-need districts send more graduates directly to four-year universities (69% against 50% in the lowest-need tenth), because graduates in affluent districts are far more likely to spend a year retaking the entrance examination (29% against 11% recorded in "other" destinations).
- **Resources follow school size, not need.** High-need schools have 16% more classroom teachers per pupil and 24% more school-account spending per pupil than low-need middle schools, but this reflects the many small rural schools in high-need districts. Comparing schools of similar size and remoteness in the same office of education, the ratio of classroom teachers per pupil at the 90th and 10th percentiles of need is 1.02 in elementary, 1.01 in middle and 1.02 in general high schools. School-account spending ratios are 1.01, 1.01 and 1.01.
- **The small advantages that exist come through support staff and slightly smaller classes.** Within offices, high-need schools have 7–9% more non-teaching staff per pupil and classes about 4% smaller, but no more teachers per class, and a slightly higher share of teachers who have not yet obtained the first-grade certificate.
- **Parent payments follow local income.** Within offices, a 10% difference in district average income is associated with about 10% more parent-paid revenue per pupil in elementary school accounts and 11% in general high schools, while government transfers do not rise with income. Parent payments are a small share of school accounts, and teacher salaries, which are not in school accounts, do not depend on local revenue.
- **Between offices, size-adjusted teacher supply leans slightly against need.** Sejong, Seoul and Gyeonggi, the lowest-need offices, have more classroom teachers per pupil than similar

schools nationally; Busan, Incheon, Gyeongnam and the Jeolla provinces have fewer (correlation between office need and adjusted teacher supply: -0.46 for middle schools).

Korea's system is therefore close to need-neutral. Its formula funds positions in proportion to classes and schools, which protects small rural schools and gives every pupil similar staffing, but it does little to direct additional resources to the children whose progression is most at risk. This conclusion is limited by the absence of school-level achievement data and of school-level poverty counts; the need index is measured by district, which will understate differentiation within districts.

1. Framing: Equal Opportunity, Risk and Resources

1.1 The purpose of a school finance system

This report starts from the purpose of school finance systems as Baker, Atchison and Levin (2026) define it: to deliver the resources schools need to give every child an equal opportunity to achieve common, adequate outcome goals. **Equal opportunity** holds when children's chances of reaching common goals do not depend on their backgrounds or where they attend school. **Adequacy** holds when those goals are high enough for children to become productive, self-determined and civically engaged adults. The framework rests on the evidence that money spent on schooling affects children's achievement, attainment and later-life outcomes (Baker & Knight, 2025; Jackson & Mackevicius, 2024).

1.2 From spending parity to equal opportunity

Early school finance standards focused on fiscal neutrality, the principle that the quality of a child's education should not depend on local wealth (Coons, Clune & Sugarman, 1969), and on horizontal and vertical equity (Berne & Stiefel, 1984). The unified framework treats common outcome goals as the point of equal treatment: children expected to meet the same standards are similarly situated with respect to them, and equal opportunity requires differentiating resources by the obstacles they face (Baker & Green, 2008). A group whose chances of meeting common goals are systematically lower has a claim on additional resources, and the evidence for that claim is the relationship between the group's characteristics and its outcomes.

1.3 Korea's commitments and finance system

Article 31 of the Constitution provides that all citizens have an equal right to receive an education corresponding to their abilities, that compulsory education is free, and that the education system and its finance are determined by law. The Framework Act on Education prohibits discrimination in education on grounds including social status and economic position, and requires the State and local governments to devise and implement policies that minimize regional gaps in educational conditions, including the supply of teachers (art. 4). It also requires scholarship and school-cost support for those who have difficulty receiving education for economic reasons (art. 28). Korea has ratified the International Covenant on Economic, Social and Cultural Rights and the Convention on the Rights of the Child.

Primary and secondary education is administered by 17 offices of education, one for each province and metropolitan city, headed by elected superintendents. They have no taxing power. Most of their revenue comes from the Local Education Finance Grant, fixed by law at 20.79% of national internal tax revenue plus a share of the national education tax. Of the grant, 97% is distributed as an ordinary grant equal to the gap between each office's standard financial demand and its standard revenue, and 3% as special grants (Local Education Finance Grants Act, arts. 3 and 5). Standard

financial demand is computed from counts of staff, schools, classes and pupils, with smaller items using the number of basic livelihood recipients and rural small schools (Enforcement Decree, Annex 1). Provincial and metropolitan governments must transfer the local education tax, 45% of tobacco consumption tax in metropolitan areas, and 3.6% to 10% of their own taxes to their office of education (art. 11), and city, county and district governments may add voluntary education subsidies. The grant was proposed at about ₩72 trillion for 2025, within a Ministry of Education budget of about ₩105 trillion.

Public school teachers are education civil servants paid on a single national salary scale. Offices assign teaching posts to schools largely in proportion to classes, so the number of teachers per pupil is set mainly by class-size standards and school size. Each school also keeps a school account (학교회계), which receives a lump-sum operating grant and earmarked funds from the office, municipal subsidies and parent payments for meals, after-school programs and activities. It pays for everything except the salaries of permanent teachers and civil-service staff. Since mid-2026, the Gwangju and Jeonnam offices have been merged into a single office for the new Jeonnam-Gwangju integrated special city; this report uses the boundaries in force during the period analyzed.

Two features of Korean schooling shape what can be measured. First, private spending on tutoring is large and steeply graded by income: in 2024 it totaled about ₩29.2 trillion, averaging ₩676,000 a month per student in households earning ₩8 million or more and ₩205,000 in households earning under ₩3 million (Statistics Korea, 2025). Public resources are therefore only part of the resources that reach children. Second, entry to high school is partly selective: autonomous private, science and foreign-language high schools admit by application, and vocational (specialized and meister) high schools enroll roughly 15% of high-school students.

1.4 Risk and resource analysis

- **Step 1a: risk (needs) analysis.** Construct a comprehensive outcome measure and test which candidate measures of pupil and community need most strongly predict lower outcomes: Outcomes = f(Needs, Context).
- **Step 1b: spending analysis.** Relate current resources to need while accounting for cost factors such as scale and remoteness: Resources = f(Needs, Context). Because Korean teachers are paid on a national scale, no labor-cost adjustment is needed. A fiscal-neutrality test asks which revenue sources follow local income.

Step 2, cost modeling and the translation of costs into allocation weights, is discussed in Section 4 but not estimated.

1.5 Data

Table 1. Data sources

Domain	Source	Level / years	Use
Enrollment, classes	School Info (학교알리미) public disclosure: students by grade and class	School; 2019–2025	Size, class size, special classes
Teachers	School Info: teachers by position and by certificate type	School; 2019–2025	Classroom teachers, contract and second-grade certificate shares
Staff	School Info: non-teaching staff	School; 2019–2025	Staff per pupil
School accounts	School Info: year-end revenue and expenditure of public schools	School; fiscal 2018–2024	Spending and revenue by source per pupil

Outcomes	School Info: graduates' destinations	Middle and high school; 2019–2025 (2023 unavailable)	Progression to vocational and selective high schools; university entry
School need	School Info: scholarships and school-cost support; after-school support	School; 2019–2025	Candidate need measures
District need	Social Security Information Service: recipients by programme and district	District; Dec. 2025	Education-benefit, basic livelihood and near-poor recipients
Population	National Health Insurance Service: covered population by age and insurance type	District; Dec. 2024	Denominators; children in regionally insured households
Income	National Pension Service: average reported monthly income of subscribers	District; Dec. 2025	District income
Geography	School coordinates; 2025 administrative-dong boundaries	School; district	Remoteness, maps

Note: School Info data were retrieved from schoolinfo.go.kr through its public data service, district data from data.go.kr, in October 2026. Disclosure year t refers to enrollment and staffing on 1 April of year t; school accounts disclosed in year t refer to fiscal year t−1 (March to February) and are matched to that year's enrollment. Districts are the 229 local governments (시/·군·구), with non-autonomous city wards combined into their cities and Incheon's 2026 reorganized wards mapped to their predecessors.

The analysis covers public (national and public) elementary, middle and general high schools. Vocational, special-purpose and autonomous high schools are excluded from the main high-school models because they recruit across districts and have distinct staffing rules. Private middle and high schools, which are publicly funded in Korea but not included in the public school-account data, are also excluded. In 2024 the sample includes 6,228 elementary schools (2.45 million pupils), 2,673 middle schools (1.13 million) and 1,004 general high schools (0.63 million).

2. Risk Modeling

2.1 What can be measured as an outcome

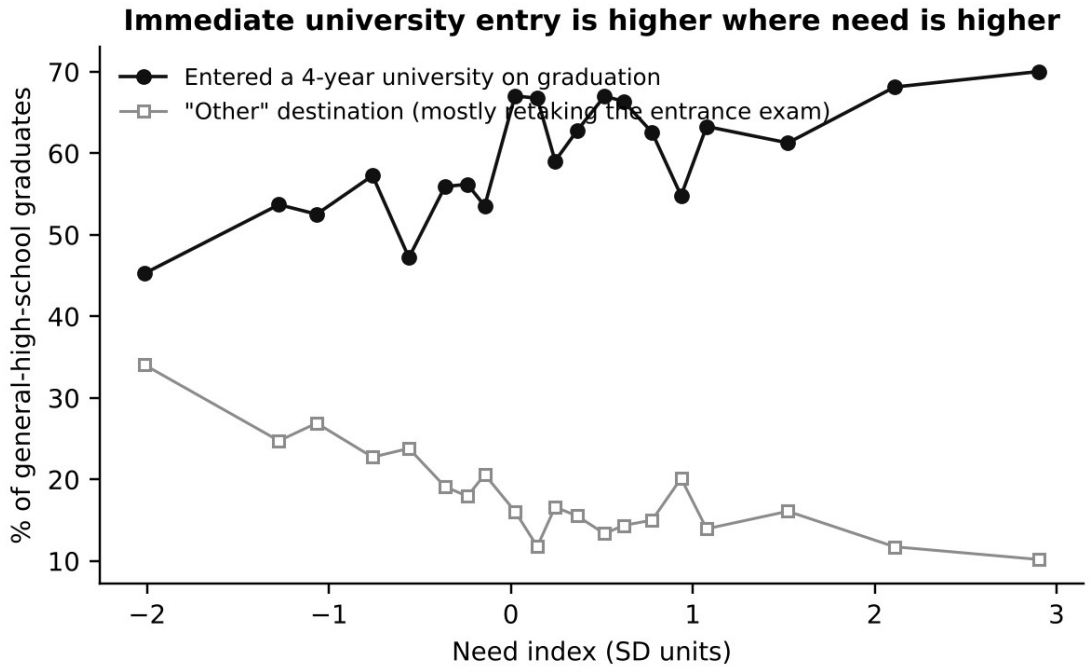
Korea's National Assessment of Educational Achievement tested all pupils in grades 9 and 11 (and grade 6 until 2012) through 2016, and results were disclosed by school. Since 2017 it has tested a sample of about 3% of pupils in grades 9 and 11, and the newer self-diagnostic assessments are not published by school. School-level achievement therefore cannot be measured with open data. The best available school-level outcome is the destination of graduates, which every middle and high school discloses.

For middle schools, two destinations are informative. Entry to vocational (specialized and meister) high schools is strongly associated with lower achievement and family background in Korea; entry to selective high schools (science, foreign-language and international, and autonomous private high schools) with higher achievement and family resources. The two shares are negatively correlated across schools ($r = -0.34$) and stable from year to year (year-to-year correlations of 0.69 and 0.83). The outcome measure is the average of the standardized selective share and the reversed vocational share, averaged over 2019–2025 and weighted by graduates. It is a measure of academic progression, not achievement, and it partly reflects the supply of each type of high school nearby; office fixed effects and rurality controls are included when testing whether need measures predict it.

For general high schools, the disclosed destinations are entry to four-year universities, entry to junior colleges, employment and "other". As Figure 1 shows, immediate four-year university entry is higher where need is higher, because graduates of schools in affluent districts are far more likely to defer

entry and retake the College Scholastic Ability Test, and are recorded under “other”. Immediate entry is therefore not used as an outcome.

Figure 1. Destinations of general-high-school graduates by need, 2019–2025



Note: Public general high schools; points are twentieths of the need index defined in Section 2.3, weighted by graduates.

2.2 Candidate need measures

Korea does not publish counts of low-income pupils by school. Candidate need measures are therefore drawn from district administrative data and from the few school-level indicators that relate to need:

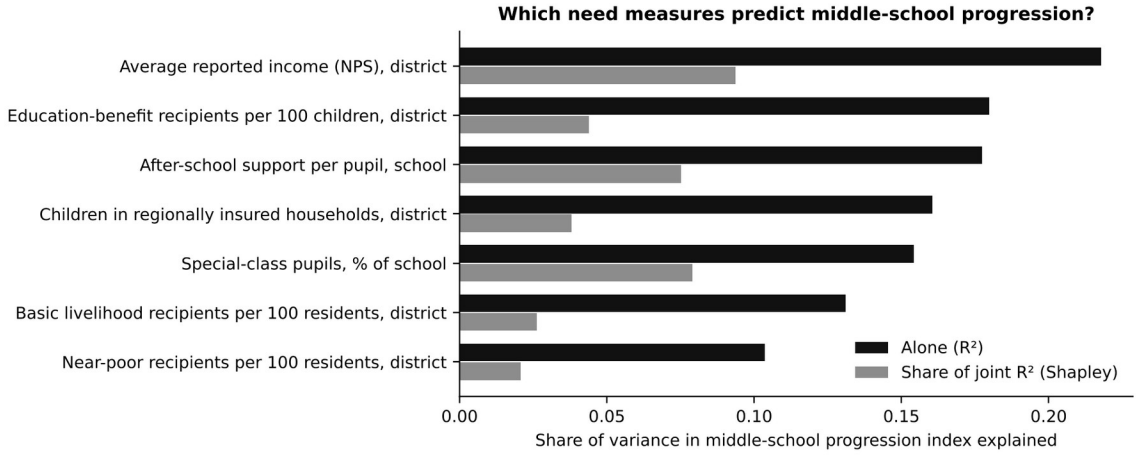
- **District:** education-benefit recipients (pupils in households below 50% of the standard median income) per 100 children; basic livelihood and near-poor recipients per 100 residents; the share of children whose households are regionally insured under National Health Insurance, that is, not covered through a regular employer; and the average reported monthly income of National Pension subscribers.
- **School:** after-school support per pupil beyond parent fees, which funds vouchers for low-income pupils and programs in rural schools; the share of pupils in special classes; and the share receiving scholarships or school-cost support.

Table 2. Need measures and middle-school progression

Measure	R^2 alone	Shapley share of joint R^2	Expected sign
Average reported income (log), district	0.218	0.094	Yes
Education-benefit recipients per 100 children, district	0.180	0.044	Yes
After-school support per pupil (log), school	0.177	0.075	Yes
Children in regionally insured households (%), district	0.161	0.038	Yes
Pupils in special classes (%), school	0.154	0.079	Yes
Basic livelihood recipients per 100 residents, district	0.131	0.026	Yes
Near-poor recipients per 100 residents, district	0.104	0.021	Yes

Note: 2,678 public middle schools; graduate-weighted least squares. Joint R² with all seven measures = 0.377.

Figure 2. Predictive power of candidate need measures for middle-school progression



District income is the strongest single predictor, explaining 22% of the variation in middle-school progression, followed by the education-benefit rate (18%). The school-level indicators add independent information: after-school support and the special-class share each carry a Shapley share comparable to district income.

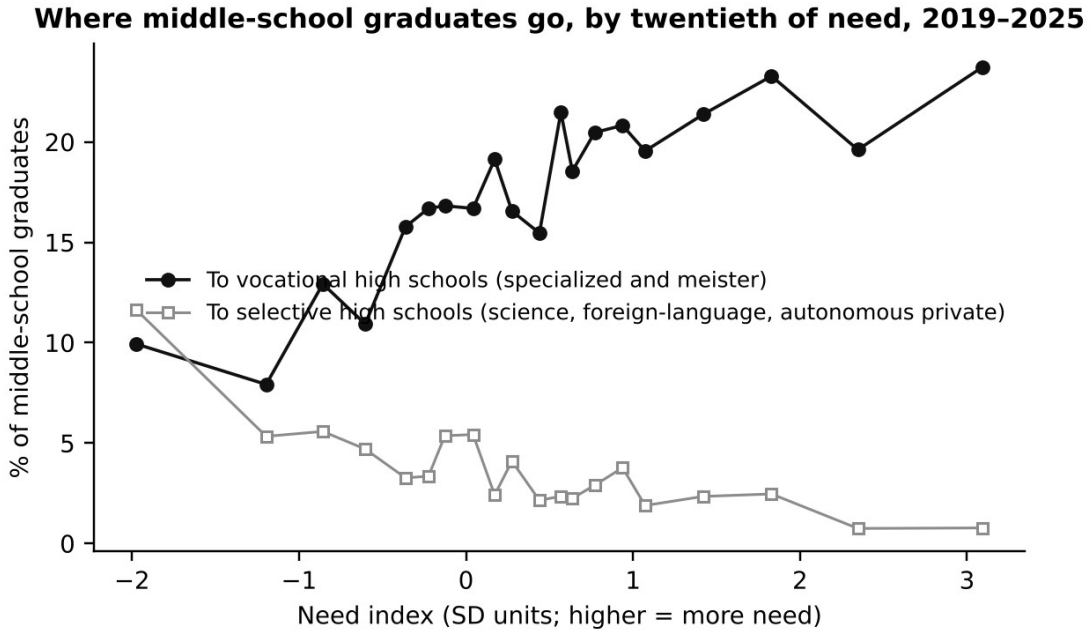
2.3 Multivariate risk model and the need index

Forward selection on five-fold cross-validated R², with folds grouped by district and all coefficients required to keep the expected sign, selects district income, the special-class share and after-school support, reaching a cross-validated R² of 0.35. Adding office fixed effects, school size and rurality raises the in-sample R² to 0.51, and the need measures remain significant.

Two of the selected school-level measures are not suitable for testing resource allocation, because they are themselves resources or bring resources with them: after-school support is part of school-account spending, and special classes come with special-education teachers and small classes. The need index used in the resource models is therefore built from district measures only. Forward selection among district measures selects district income and the share of children in regionally insured households (cross-validated R² 0.24). The index is the reversed prediction of that model, standardized to mean zero and standard deviation one across pupils in 2024. Because it is measured by district, all schools in a district share the same value, and differences in need between schools within a district are not captured.

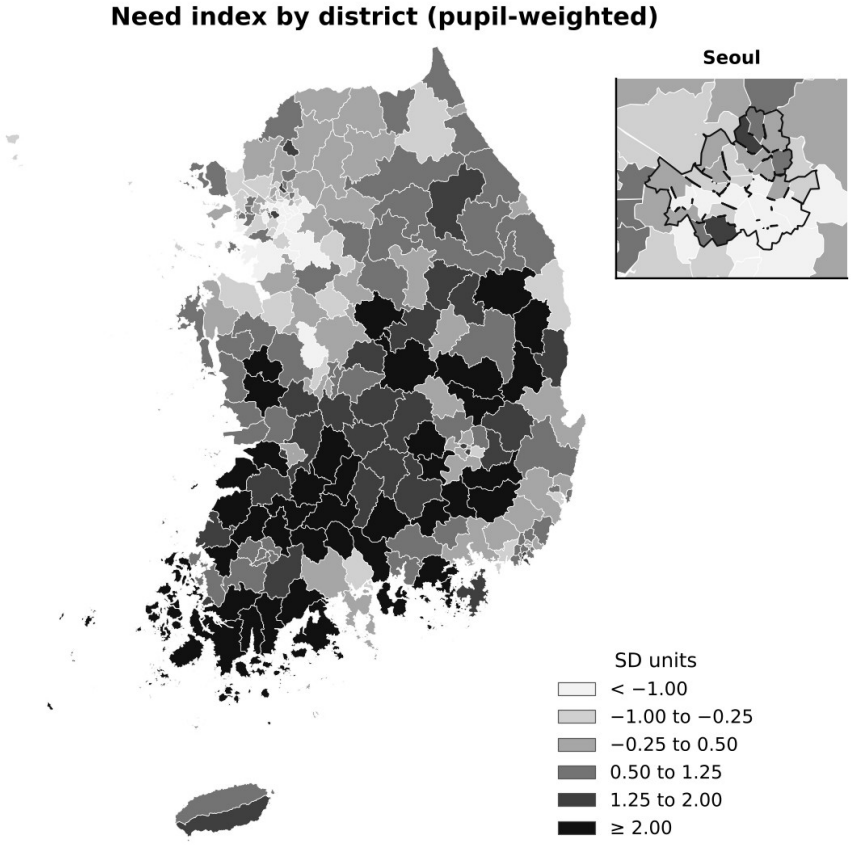
Middle schools at the 90th percentile of need score 1.6 standard deviations lower on the progression measure than those at the 10th (Figure 3). In the highest-need tenth of middle schools, 21% of graduates enter vocational high schools and 0.8% selective high schools; in the lowest-need tenth, 9% and 8%.

Figure 3. Destinations of middle-school graduates by need



Note: Public middle schools; points are twentieths of the need index, weighted by graduates; 2023 destinations unavailable.

Figure 4. Need index by district



Note: Pupil-weighted mean of the need index across public schools, 2024. Higher values indicate more need.

The geography of need follows the familiar divide between the capital region and the rest of the country, with important exceptions. Need is lowest in Seoul's southeastern districts (Gangnam, Seocho and Songpa), in Sejong and in the newer suburbs of Gyeonggi, and highest in rural districts of the Jeolla and Gyeongsang provinces and Gangwon, as well as in several older industrial and port districts. Within Seoul, need is markedly higher in the northeastern and southwestern districts.

3. Resource Modeling

3.1 Resource measures

Five resource measures are analyzed for each school and year:

- **Classroom teachers per 100 pupils**: regular, head and fixed-term contract teachers, excluding principals, vice-principals, special-education teachers, counselors and other specialists, divided by pupils in general classes. This is the main resource, since teacher salaries account for most spending.
- **Classes per 100 pupils** and **teachers per class**, which decompose classroom teachers per pupil into class size and staffing intensity.
- **Non-teaching staff per 100 pupils**: civil-service and education support staff.
- **School-account operating spending per pupil**: year-end expenditure excluding capital works and financial transactions, in thousand won. It excludes the salaries of permanent teachers and civil-service staff.
- **Teacher experience and contract status**: the share of fixed-term contract teachers, and the share of certified teachers holding the second-grade certificate, which teachers typically hold in their first years of service.

Table 3. Resources in public schools, 2024 (pupil-weighted means)

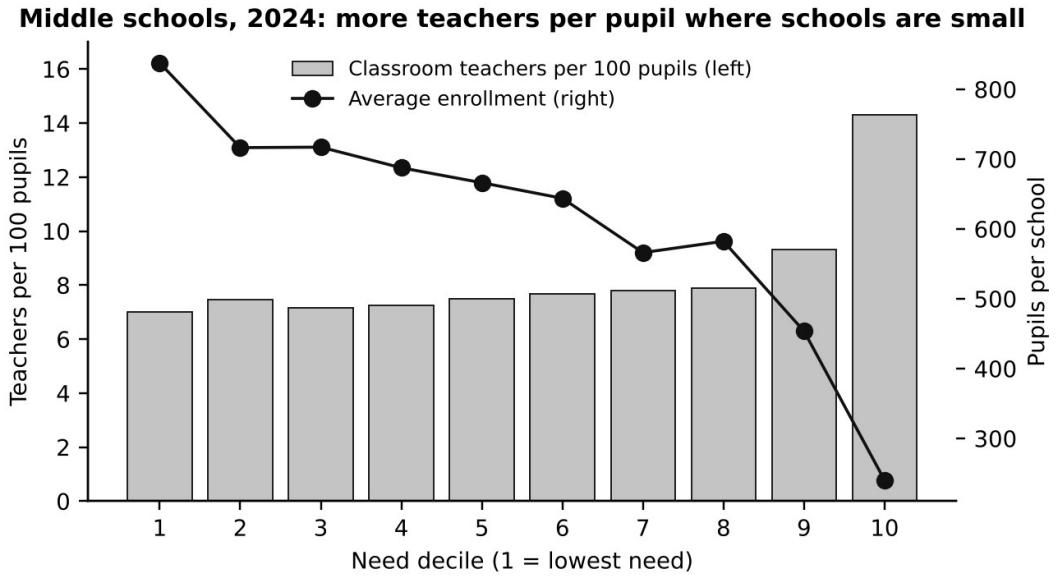
Level	Schools	Pupils (000)	Classroom teachers /100 pupils	Pupils per class	Staff /100 pupils	School-account spending /pupil (₩000)	Parent revenue /pupil (₩000)	Contract teachers	Second-grade certificate
Elementary	6,228	2,455	6.8	21.4	3.8	4,223	430	8%	15%
Middle	2,673	1,127	7.6	25.6	3.1	3,705	237	20%	28%
General high	1,004	630	8.4	25.7	2.8	4,128	386	15%	20%

Note: School-account figures are for fiscal 2023. Public schools; general high schools only.

3.2 Descriptive patterns

Without adjustment, high-need schools appear well resourced. Middle schools in the highest tenth of need have 14.3 classroom teachers per 100 pupils, against 7.0 in the lowest tenth, and spend ₩8.4 million per pupil through their school accounts, against ₩3.1 million. But average enrollment falls from 838 pupils in the lowest tenth of need to 240 in the highest, and 26% of pupils in the highest tenth attend schools in rural townships (면), against 2% in the lowest (Figure 5). Because posts are allocated by class, small schools have many more teachers per pupil, and high-need districts have many small schools.

Figure 5. Classroom teachers per pupil and school size by need decile, middle schools, 2024



3.3 Model specification

Each resource measure (in logs) is regressed on the need index with pupil weights and standard errors clustered by district, separately for each school level, in four nested specifications:

- **S1:** need and year.
- **S2:** adds a quadratic in log enrollment, because staffing rules give small schools more resources per pupil.
- **S3:** adds remoteness and rurality: indicators for schools located in rural townships (면) and towns (읍), the log number of schools within 10 km and the log distance to the fifth-nearest school. No labor-cost index is needed because teachers are paid on a national scale.
- **S4:** adds office-of-education fixed effects, restricting comparisons to schools within the same office.

The summary statistic is the ratio of predicted resources at the 90th and 10th pupil-weighted percentiles of need, with other covariates held constant. Ratios above one indicate progressive allocation and ratios below one regressive allocation.

3.4 Results

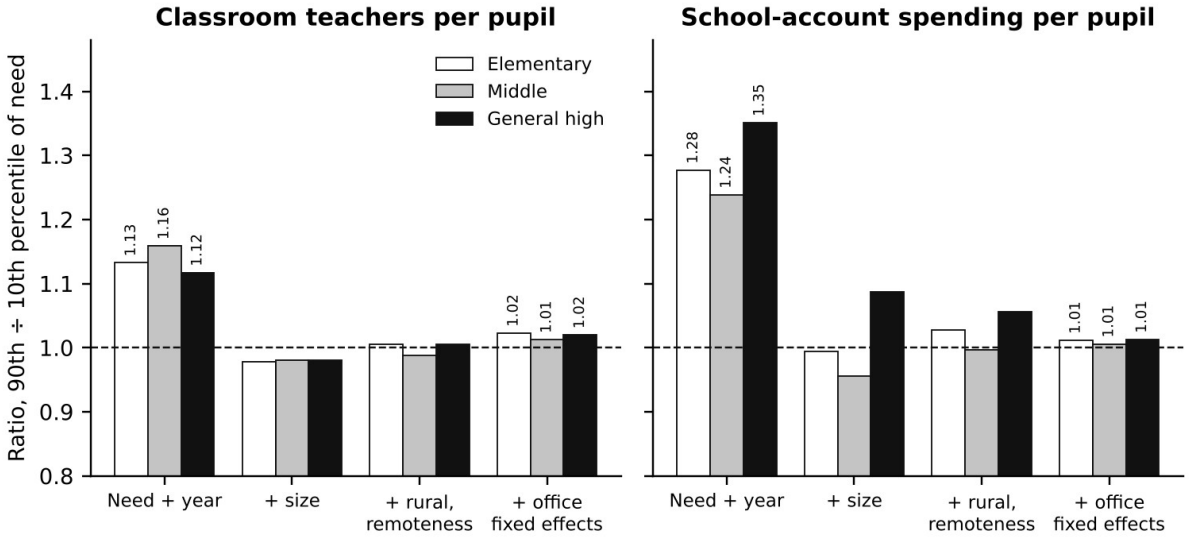
Table 4. Ratio of predicted resources at the 90th and 10th percentiles of need

Resource	Level	S1	S2	S3	S4
Classroom teachers per pupil	Elementary	1.13	0.98	1.01	1.02*
	Middle	1.16	0.98	0.99	1.01
	General high	1.12	0.98	1.01	1.02
Classes per pupil	Elementary	1.16	1.02	1.04	1.04*
	Middle	1.14	1.02	1.03	1.04*
	General high	1.11	0.99	1.01	1.03
Teachers per class	Elementary	0.97	0.96	0.97	0.98*
	Middle	1.02	0.97	0.96	0.98*
	General high	1.00	0.99	0.99	0.99

Non-teaching staff per pupil	Elementary	1.45	1.05	1.04	1.08*
	Middle	1.43	1.05	1.05	1.07*
	General high	1.43	1.14	1.09	1.09*
School-account spending per pupil	Elementary	1.28	0.99	1.03	1.01
	Middle	1.24	0.96	1.00	1.01
	General high	1.35	1.09	1.06	1.01
Government transfers to school account per pupil	Elementary	1.29	0.99	1.01	1.03*
	Middle	1.23	0.95	0.99	1.02
	General high	1.33	1.07	1.04	1.02
Parent-paid revenue per pupil	Elementary	0.99	0.91	1.03	0.88*
	Middle	1.10	0.92	0.95	0.97
	General high	1.52	1.26	1.10	0.93

*Note: S1 need + year; S2 + enrollment (quadratic in logs); S3 + rurality and remoteness; S4 + office fixed effects. * S4 coefficient significant at 5% (standard errors clustered by district). Elementary 43,554, middle 18,596 and general high 6,982 school-years; school accounts 2018–2023 fiscal years.*

Figure 6. Ratio of predicted resources at high to low need, by specification and level



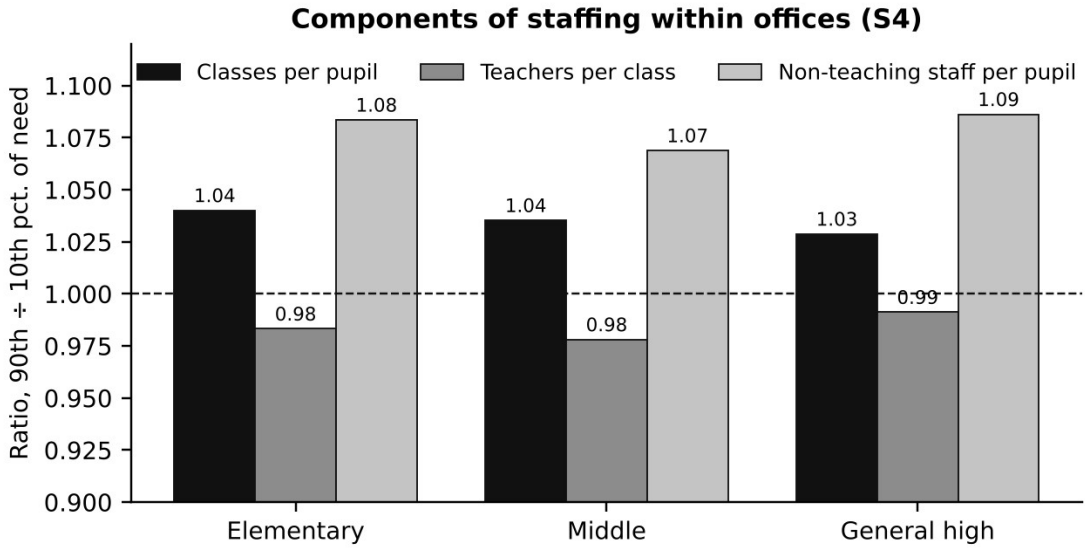
The pattern is the same at every level. In S1, high-need schools have 13–16% more classroom teachers per pupil and 24–35% more school-account spending per pupil. Controlling for enrollment removes the entire advantage: in S2 the teacher ratios are 0.98–0.98. With rurality, remoteness and office fixed effects, the ratios settle between 1.01 and 1.02 for teachers and 1.01 and 1.01 for school-account spending. Korea's allocation of its main educational resources is, to a close approximation, need-neutral.

3.5 What the small differences consist of

Within offices, the slight progressivity in classroom teachers comes entirely from smaller classes: high-need schools have about 4% more classes per pupil, but about 2% fewer teachers per class (Figure 7). The clearest differentiation is in non-teaching staff, 8–9% more per pupil in high-need schools, which includes education-welfare staff placed in schools with many low-income pupils. The student welfare and gap-closing line of the school account, which includes programmes such as the Education Welfare Priority Support Project, is 4% higher per pupil in high-need middle schools within offices (2% in elementary, 2% in general high schools).

Teachers in high-need schools are, if anything, slightly less experienced: within offices, the share holding only the second-grade certificate is 3.3 percentage points higher at the 90th than at the 10th percentile of need in middle schools (2.1 in elementary), while contract-teacher shares are similar. Because salaries rise with experience on the national scale, the slight progressivity in teacher numbers is likely offset in won.

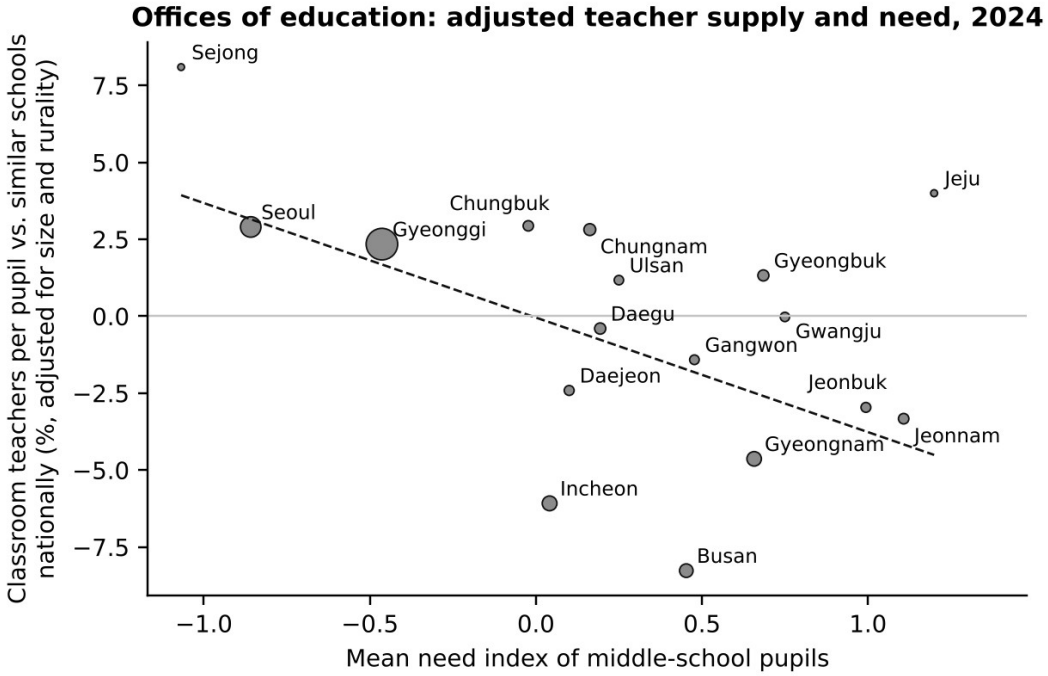
Figure 7. Components of staffing differences within offices of education (S4)



3.6 Between offices of education

The office fixed effects in S4 remove differences between offices. To compare offices, resources are adjusted nationally for size, rurality and remoteness, and each office's average adjusted resources are compared with its average need (Figure 8). Size-adjusted classroom teachers per pupil lean slightly against need (correlation -0.46 for middle schools, -0.34 for elementary). Sejong, the newest and lowest-need office, has 8% more classroom teachers per pupil than similar middle schools nationally, and Seoul 3% more. Busan (-8%), Incheon (-6%), Gyeongnam (-5%) and the Jeolla provinces have fewer. The differences are modest, but they run in the opposite direction from need.

Figure 8. Offices of education: need and size-adjusted classroom teachers per pupil, middle schools, 2024



Note: Bubble size proportional to enrollment. Adjusted teacher supply is the pupil-weighted mean residual from a national model of log teachers per pupil on enrollment, rurality, remoteness and year.

3.7 Which resources follow local income?

Offices of education have no taxing power, but school accounts receive municipal education subsidies and parent payments. To test whether these channels tie resources to local income, each resource is regressed on log district income within offices, with the S3 controls (Figure 9). Parent-paid revenue rises steeply with income: the elasticity is 0.95 in elementary schools, 0.46 in middle schools and 1.07 in general high schools. Government transfers to school accounts, which include municipal subsidies, do not rise with income (elasticities -0.18 to -0.05), and classroom teachers per pupil are slightly lower in higher-income districts (-0.19 in elementary). The fiscal-neutrality concern in Korea therefore lies in parent payments, which averaged about ₩430,000 per elementary pupil in fiscal 2023 against ₩3.8 million in government transfers, and above all in private tutoring outside the public system.

Figure 9. Elasticity of school resources with respect to district income, within offices

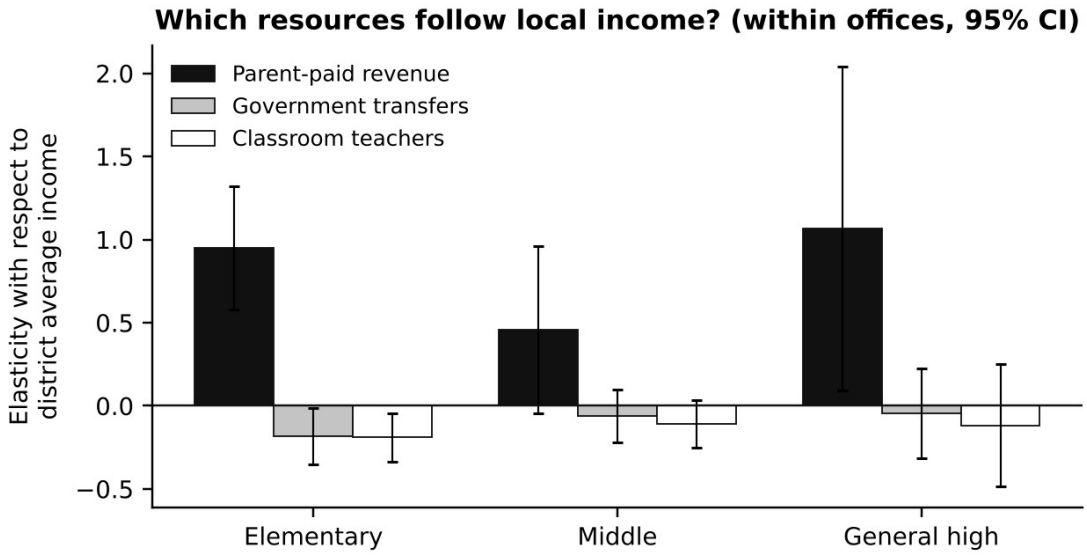
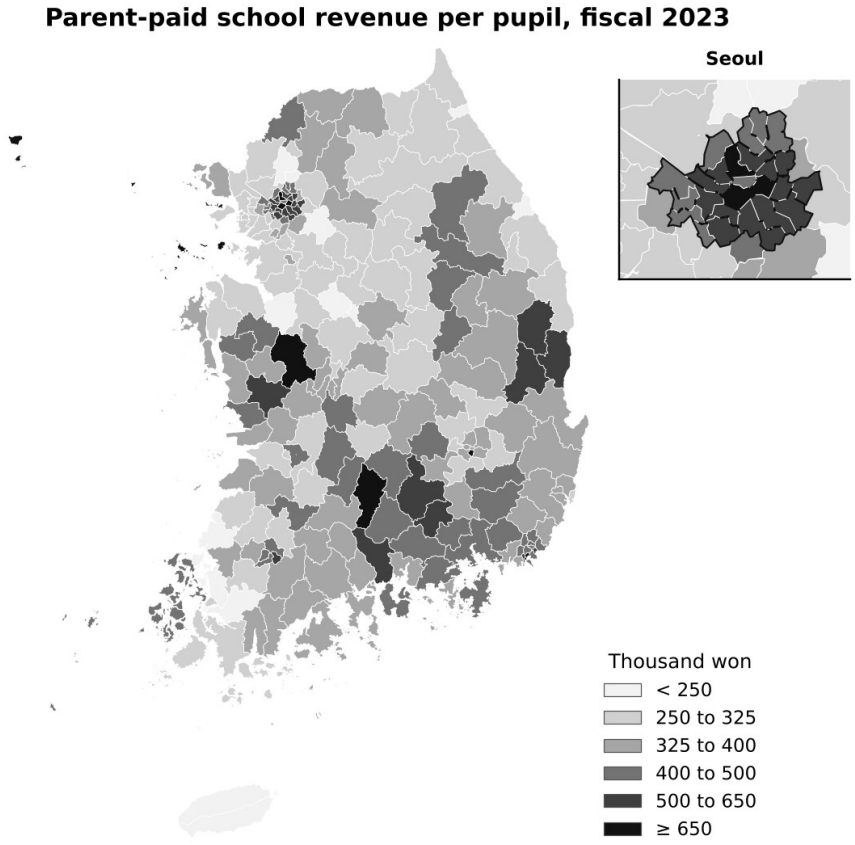


Figure 10. Parent-paid school revenue per pupil by district



Note: Pupil-weighted mean across public elementary, middle and general high schools, fiscal 2023.

3.8 Changes over time

The S4 ratio for classroom teachers was essentially unchanged from 2019 to 2025: between 1.00 and 1.02 in middle schools and between 1.02 and 1.03 in elementary schools. Falling elementary enrollment raised elementary classroom teachers per 100 pupils from about 6.0 to 7.1 over the period without changing their distribution with respect to need.

3.9 Robustness and limitations

- **School-level need.** Using the share of pupils receiving scholarships or school-cost support as a school-level need measure, within offices with the S3 controls, gives teacher ratios of 1.01 (middle) and 1.01 (general high) and school-account spending ratios of 1.06 and 1.04. School budgets respond somewhat more to school-level need than to district need, but teacher allocations do not.
- **Measurement of need.** The need index is measured by district. Differences in need among schools within a district, which are large in cities, are not captured, and the ratios are likely biased toward one. School-level counts of education-benefit recipients exist in administrative records and would remove this limitation.
- **Outcomes.** Progression to vocational and selective high schools reflects choice and local supply as well as achievement. It is the best open measure available, but it is not a substitute for school-level achievement data.
- **Resources.** School-account data exclude permanent teacher and civil-service salaries, and the staffing data do not record experience directly. A complete spending measure would require school-level salary costs.
- **Coverage.** Private middle and high schools, which enroll about 16% of middle-school and 40% of high-school pupils and are largely funded by offices of education, are excluded, as are vocational and selective high schools. Graduates' destinations for 2023 could not be retrieved.

4. Conclusions and Implications

Korea illustrates a fourth pattern alongside the three earlier country studies. Mexico's federal payroll is regressive, Brazil's municipal spending is regressive between states and neutral within them, and France's teaching hours are progressive. Korea's staffing and school budgets are close to need-neutral. Its formula reliably equalizes resources per class across a country with rapidly shrinking and highly unequal school sizes, and the many small rural schools in high-need districts receive generous staffing per pupil. But once size is accounted for, children in high-need districts attend schools with essentially the same staffing and budgets as children elsewhere, slightly less experienced teachers, and much smaller contributions from parents.

In the framework's terms, that is not equal opportunity. Graduates of the highest-need middle schools are more than twice as likely to enter vocational high schools as those of the lowest-need schools, and about a tenth as likely to enter selective academic high schools, while the highest-income families spend about three times as much per student on private tutoring as the lowest-income families. The Framework Act on Education's instruction to minimize regional gaps in educational conditions has been implemented mainly as equalization of inputs per class. Moving toward equal opportunity would require weighting allocations by pupil need, through the ordinary grant formula and through offices' own allocations to schools, and extending need-based differentiation from support staff and earmarked welfare programs to teaching positions.

Three steps would make that possible. First, offices of education could publish, by school, the counts of pupils receiving education benefits and other need indicators they already hold, which would allow need to be measured where resources are allocated. Second, school-level results from a census assessment, or the release of existing self-diagnostic results by school, would allow risk to be measured as achievement rather than progression. Third, with those data, cost modeling (Step 2) could estimate how much more high-need schools require to give their pupils equal chances of reaching common goals, and translate the estimates into weights for the Local Education Finance Grant and for offices' school allocations.

Technical Notes

- Sample: public (national and public) schools with positive enrollment and not excluded from disclosure; general high schools only (일반고); school-years 2019–2025 for staffing and fiscal 2018–2024 for school accounts. Branch schools are included as reported.
- Districts: 229 local governments. School addresses use current names; cities with non-autonomous wards are combined; Incheon's 2026 wards (Jemulpo-gu, Yeongjong-gu, Seohae-gu, Geomdan-gu) are mapped to the former Jung-gu and Dong-gu (combined) and Seo-gu; Gwangju and Jeonnam are kept separate.
- Middle-school destinations: shares of graduates entering specialized and meister high schools (vocational) and science, foreign-language/international and autonomous private high schools (selective), identified from the School Info destination categories.
- Risk models: graduate-weighted least squares on school averages over 2019–2025; five-fold cross-validation with folds grouped by district; forward selection requiring expected signs and a gain of at least 0.005 in cross-validated R^2.
- Need index: reversed prediction of the district-only model (log National Pension average income and the share of children aged 0–19 in regionally insured households), standardized across pupils in 2024.
- Resource models: pupil-weighted least squares with year effects, standard errors clustered by district; ratios evaluated at the 10th and 90th pupil-weighted percentiles of need in 2024.
- Remoteness: schools within 10 km and distance to the fifth-nearest school are computed from school coordinates across all public elementary, middle and high schools.

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