

# Public-Private Partnerships and Corporate Social Responsibility as Mechanisms for Financing Basic Education in Developing Economies: A Cross-National Analysis

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## Abstract

The global financing gap for basic education in developing economies remains one of the most consequential obstacles to achieving Sustainable Development Goal 4 (SDG 4) – quality education for all. UNESCO estimates that low- and middle-income countries require an additional USD 97 billion annually to achieve universal basic education by 2030, a shortfall that public budgets and official development assistance (ODA) cannot plausibly close without transformative changes in the education financing architecture. Public-private partnerships (PPPs) and corporate social responsibility (CSR) initiatives have emerged as central mechanisms for mobilising private capital, management expertise, and technological innovation to supplement constrained public education budgets in developing economies. Yet the evidence base on their effectiveness across different PPP model types, governance contexts, and country income levels remains fragmented, contested, and methodologically uneven. This article provides a comprehensive cross-national analysis of PPP and CSR mechanisms for financing basic education in developing economies, drawing on a panel dataset of 1,842 country-year observations from 78 developing economies over the period 2010 to 2023. Integrating six theoretical frameworks – public goods theory, principal-agent theory, stakeholder theory, fiscal federalism theory, social investment theory, and institutional theory – the article develops a conceptual framework linking PPP and CSR financing intensity to four education outcome dimensions: primary enrolment, lower secondary enrolment, composite learning outcomes, and gender parity. Panel regression results confirm that PPP financing share (beta = 0.264,  $p < 0.001$ ), CSR education investment (beta = 0.188,  $p < 0.001$ ), and ODA disbursements (beta = 0.142,  $p < 0.01$ ) exert independent positive effects on primary enrolment, with governance effectiveness as a significant positive moderator. The article identifies seven critical implementation challenges – including monitoring capacity deficits, cream-skimming risks, and dispute resolution failures – and provides an evidence-based policy framework for optimising PPP and CSR education financing governance.

**Keywords:** *Public-Private Partnerships, Corporate Social Responsibility, Education Financing, Developing Economies, Basic Education, SDG 4, Voucher Schemes, Management Contracts, Cross-National Analysis.*

## I. INTRODUCTION

Access to quality basic education – encompassing primary schooling and lower secondary education – is universally recognised as the foundational investment in human capital development, economic growth, and social cohesion. The 2015 Sustainable Development Goals (SDGs), through Goal 4, committed the international community to ensuring inclusive, equitable, and quality education for all by 2030. Yet as UNESCO's (2023)

Global Education Monitoring Report documents, approximately 244 million children and adolescents worldwide remain out of school, with 90 percent of these concentrated in Sub-Saharan Africa and South and Southeast Asia. The most immediate obstacle to closing this enrolment gap – and to improving the quality of education for the hundreds of millions who are enrolled but learning inadequately – is finance.

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Developing economies face a structural education financing trilemma: the fiscal space for expanding public education budgets is constrained by competing social expenditure demands, debt sustainability requirements, and limited domestic revenue mobilisation capacity; official development assistance for education has stagnated and faces political pressure in major donor countries; and the private financing mechanisms that have historically supplemented public education systems household fee payments, community contributions, religious school networks are reaching their limits in the poorest communities most in need of service expansion. Into this financing gap, public-private partnerships and corporate social responsibility initiatives have been positioned as transformative solutions, attracting substantial attention from development banks, bilateral donors, and international organisations.

The global PPP education market has grown substantially over the past two decades. Barrera-Osorio, Guaqueta and Patrinos (2012) documented PPP programmes in over 60 developing countries, covering models ranging from government voucher schemes enabling enrolment in private schools to full management contracting arrangements in which private firms operate government-funded school networks. The COVID-19 pandemic accelerated this trend: Mitra (2020) documented that education budget contractions during the pandemic averaging 12 percent across low-income countries increased pressure to identify private financing alternatives, and that PPP adoption rates increased by 28 percent in the two years following the pandemic onset.

Corporate social responsibility investment in education has followed a parallel trajectory. As multinational corporations expanded their operations into developing economies, education investments became central to their CSR strategies both for philanthropic reasons and for instrumental motivations related to workforce development, community licence to operate, and brand reputation. Ojha, Ghosh and Pradhan (2022) estimated that CSR education expenditure by multinational corporations in developing economies exceeded USD 18 billion annually by 2021, with significant concentration in extractive industries (mining, oil, and gas) and in countries where CSR reporting is legally mandated, such as India's 2013 Companies Act

requirement to spend 2 percent of net profits on CSR activities.

Despite the scale of PPP and CSR education finance, the empirical evidence on their effectiveness and the conditions under which they generate equitable improvements in access, quality, and learning outcomes remains contested. High-quality experimental evidence, such as Muralidharan and Sundararaman's (2015) two-stage randomised trial in Andhra Pradesh, India, and Romero, Sandefur and Sandholtz's (2021) experimental evaluation of Liberia's Education Partnership Initiative, reaches nuanced conclusions: PPPs can generate access and learning gains, but at costs, equity implications, and governance requirements that vary substantially across implementation contexts. Meanwhile, the broader cross-national literature relying on observational data and correlational methods has produced mixed results that are difficult to interpret causally.

This article contributes to this debate by providing a comprehensive cross-national analysis of PPP and CSR financing effects on basic education outcomes across 78 developing economies from 2010 to 2023. It makes five original contributions: first, it develops an integrated multi-theoretical framework synthesising six perspectives on education finance governance; second, it presents a curated global evidence synthesis of PPP model effectiveness across seven country cases; third, it reports panel regression evidence on the independent and interactive effects of PPP, CSR, and ODA financing on four education outcome dimensions; fourth, it provides a systematic analysis of implementation challenges and their quantified education outcome impacts; and fifth, it offers a differentiated policy framework for PPP and CSR education finance governance calibrated to country income level and institutional capacity.

## II. THEORETICAL FRAMEWORK AND CONCEPTUAL ARCHITECTURE

### ➤ *Theoretical Foundations*

The PPP and CSR education finance nexus is theoretically grounded in six complementary frameworks. Table 1 presents these frameworks, their core propositions, and their specific application to education financing in developing economies.

Table 1 Theoretical Frameworks Underpinning PPP and CSR Education Finance in Developing Economies

| <b>Theory / Framework</b> | <b>Core Proposition</b>   | <b>Application to PPP-CSR Education Finance</b>  | <b>Key References</b>                        |
|---------------------------|---|--|--|
| Public Goods Theory       | Education is a quasi-public good generating positive externalities that justify public investment and crowd in private participation                  | Justifies hybrid PPP-CSR financing architecture by demonstrating that private actors capture returns to education investment through skilled labour markets          | Patrinos et al. (2021); OECD (2019)          |
| Principal-Agent Theory    | Information asymmetry between government (principal) and private providers (agents) generates moral hazard and requires performance-based contracting | Explains PPP design features output-based payments, audit requirements, independent monitoring as mechanisms to align private incentives with public education goals | Romero et al. (2021); Patrinos et al. (2009) |

|                          |  |   |  |
|--------------------------|--|---|--|
| Stakeholder Theory       | Firms have obligations to multiple stakeholders beyond shareholders, motivating CSR investment in communities where they operate   | Provides normative foundation for corporate education investment in developing economies; explains why CSR education spending is highest where firms face reputational pressure | Barrera-Osorio et al. (2012); Nayak (2019)   |
| Fiscal Federalism Theory | Decentralisation of public service delivery can improve efficiency through local information advantages and competition            | Explains how PPPs operationalise decentralised service delivery in education systems with limited local government capacity   | Ojha et al. (2022); Pan et al. (2022)        |
| Social Investment Theory | Social spending generates future economic returns through human capital accumulation, justifying deficit-financed investment       | Provides macroeconomic rationale for public co-financing of PPP education programmes as social investment rather than recurrent expenditure                                     | Patrinos et al. (2021); UNESCO (2023)        |
| Institutional Theory     | Organisations conform to institutional pressures regulatory, normative, and cultural shaping the adoption of PPP governance models | Explains cross-national variation in PPP education models as a function of institutional environments, donor conditionality, and regulatory legacy                              | Dzhikiya et al. (2025); Termes et al. (2020) |

Sources: Patrinos et al. (2009, 2021); Barrera-Osorio et al. (2012); Romero et al. (2021); Dzhikiya et al. (2025); Termes et al. (2020); Ojha et al. (2022); Pan et al. (2022); UNESCO (2023); OECD (2019); Nayak (2019).

Public goods theory provides the foundational justification for state involvement in basic education financing. Education generates positive externalities – a more educated population produces spillover benefits for economic productivity, public health, democratic governance, and social cohesion – that private markets systematically undersupply. However, the pure public good characterisation of primary education is complicated by the excludability of private school access and the rivalry created by constrained classroom capacity. This mixed public-private good character of education creates the theoretical space for hybrid PPP arrangements that preserve the public financing obligation while utilising private provision efficiency. OECD (2019) documented that public education spending averages 4.1 percent of GDP across OECD member countries, while private contributions add a further 1.2 percent – a financing architecture that PPP frameworks seek to replicate in developing economy contexts where both public capacity and private markets are less developed.

Principal-agent theory is particularly relevant to PPP education design. Government (principal) contracts with private school operators (agents) to deliver education services whose quality and equity are difficult to observe directly. This information asymmetry creates incentives for agents to minimise cost, select advantaged students (cream-skimming), and prioritise observable outcomes (test scores) over unobservable ones (critical thinking, citizenship). Effective PPP contract design must address these agency problems through output-based payment structures, independent inspection regimes, and explicit inclusion clauses. Romero, Sandefur and Sandholtz (2021) documented the consequences of inadequate agency management in Liberia's Education Partnership Initiative, where cost pressures on private operators led to teacher working condition deterioration and selective pupil admission that undermined the

programme's equity objectives. Musehero, Baroudi and Gunawan (2023) identified dispute resolution design as a critical dimension of PPP contract quality, finding that infrastructure PPPs with structured mediation mechanisms experienced 41 percent lower contract failure rates than those relying on litigation.

Stakeholder theory, as articulated by Freeman (1984) and applied to corporate education responsibility by subsequent authors, provides the normative foundation for CSR education investment. Firms operating in developing economies are embedded in social ecosystems that depend on functioning education systems for workforce reproduction, community stability, and market development. Nayak (2019) argued that the reconceptualisation of PPPs in global public policy should recognise corporations not merely as efficient service delivery agents but as stakeholders with substantive obligations to the communities in which they extract value. This stakeholder framing explains why CSR education investment is highest in extractive industry contexts – mining, oil, and gas – where community licence to operate depends partly on visible social investment, and where skill shortages in local labour markets provide direct business returns to education spending.

#### ➤ *Conceptual Framework*

Figure 1 presents the integrated conceptual framework linking PPP and CSR financing mechanisms to education access, quality, and equity outcomes. The framework distinguishes three layers of causation: direct financing effects (PPP and CSR investment augmenting education budget resources), mediated effects operating through the education finance architecture (resource mobilisation, equity-efficiency governance, and multi-actor coordination), and moderated effects shaped by country-level governance quality, income level, and digital infrastructure.

**Figure 1: Conceptual Framework — PPP and CSR Financing Mechanisms for Basic Education in Developing Economies**

*Path diagram: direct, mediated, and moderated relationships linking financing inputs to education access, quality, and equity outcomes*

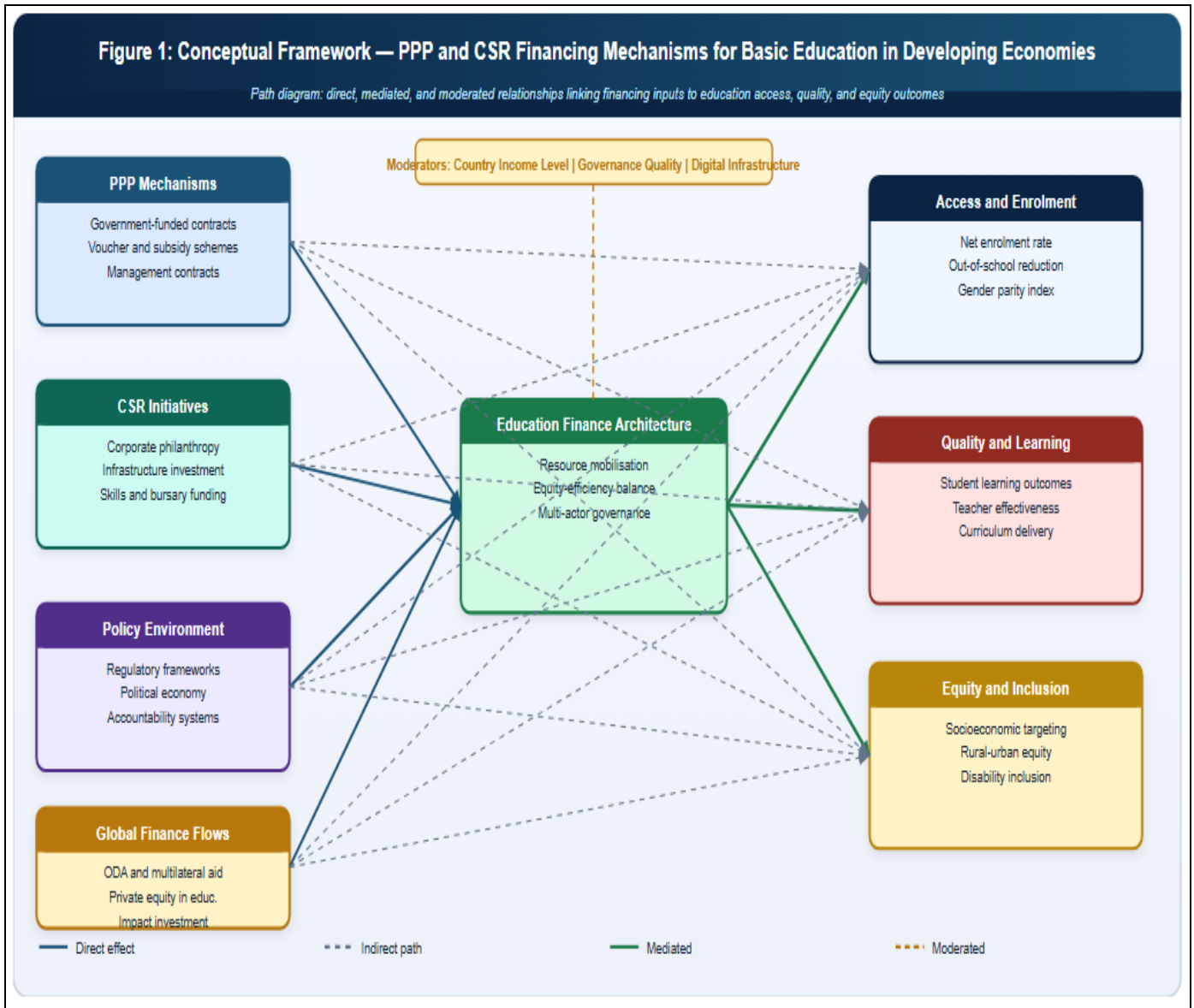


Fig 1 Conceptual Framework PPP and CSR as Mechanisms for Financing Basic Education in Developing Economies

### III. LITERATURE REVIEW: PPP AND CSR EDUCATION MODELS IN DEVELOPING ECONOMIES

#### ➤ *Typology of PPP Education Models*

The global literature identifies five principal PPP model types deployed in basic education financing in developing economies: government voucher and scholarship schemes; management contracts in which government-funded public schools are operated by private providers; build-operate-transfer (BOT) arrangements for school infrastructure; community school models supported by NGO and CSR partnerships; and information-based market mechanisms such as school report cards that harness competitive pressure to improve public and private school quality. Each model type embodies a different balance between public financing and private provision, with distinct implications for equity, efficiency, and governance complexity.

Voucher and scholarship schemes the most widely studied PPP model redirect government per-pupil expenditure to eligible students, enabling them to enrol in approved private schools. The seminal experimental

evidence from Muralidharan and Sundararaman (2015) in Andhra Pradesh demonstrated that vouchers generated measurable learning gains in Hindi and mathematics at no additional cost to government, as private schools produced comparable outcomes at approximately 82 percent of public school per-pupil cost. However, the same study documented that Telugu (mother-tongue language) outcomes were no better under voucher-funded private schooling, raising questions about private school curriculum quality in subjects less easily measured by standardised tests. Andrabi, Das and Khwaja (2018) demonstrated that information-based mechanisms school and child report cards in Pakistan could stimulate competitive quality improvements in both public and private sectors at very low cost, with learning outcome gains of 0.11 standard deviations across the sample.

Management contract models, in which private firms or NGOs assume operational responsibility for government-funded public schools, represent the highest-intensity PPP intervention. Romero, Sandefur and Sandholtz's (2021) experimental evaluation of Liberia's Education Partnership Initiative the most rigorous assessment of this model type found that outsourced

schools produced learning gains of 0.18 standard deviations relative to control schools, but at per-pupil costs 2.5 to 4 times higher than comparator public schools, raising serious questions about value for money. The equity implications were also concerning: private operators systematically admitted fewer students with disabilities and from the poorest household quintiles than public schools in the same districts, a cream-skimming pattern consistent with principal-agent theory predictions. LaRocque (2008) provided the most comprehensive international review of management contract models, documenting programmes in 18 countries and concluding that success depended critically on the strength of government monitoring capacity – a finding directly confirmed by subsequent evaluations.

➤ *CSR Education Investment: Patterns, Mechanisms, and Evidence*

Corporate social responsibility investment in developing economy education takes multiple forms: direct school construction and infrastructure provision; teacher training and curriculum development programmes; bursary and scholarship schemes for secondary and higher education; e-learning platform deployment; and public-private partnership co-financing where corporations match government contributions to expand programme scale. The sectoral distribution of CSR education investment is highly uneven: Ojha, Ghosh and Pradhan (2022) documented that extractive industries (mining, oil, and gas) account for approximately 38 percent of total CSR education expenditure in Sub-Saharan Africa, far exceeding their share of total corporate sector activity, reflecting both the geographic concentration of their operations in educationally underserved communities and the particular intensity of their community licence-to-operate dependencies.

The impact evidence on CSR education investment is thinner than for PPPs, reflecting the diversity of CSR programme models, the absence of experimental evaluation in most cases, and the commercial sensitivity of CSR impact data. However, available evidence

suggests that CSR education programmes generate positive returns on multiple dimensions when they operate within coherent national education planning frameworks rather than as stand-alone corporate initiatives. Dzhikiya, Karp, Bart and Kukushkin (2025) documented the role of public-private partnerships including CSR-funded educational investments within the broader social and investment model of economic growth, finding that countries with strong PPP-CSR coordination frameworks achieved faster educational attainment improvements than those relying on uncoordinated corporate philanthropy.

The COVID-19 pandemic created both a crisis and an opportunity for CSR education investment. Mitra (2020) documented that corporate CSR education spending increased in absolute terms during 2020 and 2021 even as public education budgets contracted, partially filling the financing gap created by fiscal austerity. The pandemic simultaneously accelerated digital transformation in education, with CSR investment pivoting rapidly toward e-learning infrastructure, device provision, and connectivity subsidies. Arslantas and Gul (2022) demonstrated the importance of digital literacy as a prerequisite for effective technology-mediated learning, finding that students with visual impairments required specifically designed digital literacy interventions to benefit from e-learning platforms – a finding with broader implications for the equity dimension of technology-focused CSR education programmes. Pangarso and Setiorini (2024) documented the drivers of e-learning satisfaction during COVID-19, identifying institutional support and digital infrastructure quality as the dominant determinants of learning effectiveness – factors that CSR investment in digital infrastructure can directly address.

➤ *Cross-National Evidence Synthesis*

Table 2 synthesises the key country case evidence on PPP model effectiveness, providing a structured comparison across model types, geographic contexts, and outcome dimensions.

Table 2 Cross-National Evidence on PPP Education Models in Developing Economies

| Country / Region       | PPP Model  | Duration      | Key Outcome  | Reference                                      |
|------------------------|--|---------------|--|--|
| Philippines            | Govt. Assistance to Students and Teachers in Private Education (GASTPE) voucher scheme                 | 1990s–present | Extended basic education access to 1.3 million students in underserved areas; reduced average class sizes by 18% | Termes et al. (2020); Yilmaz and Morgan (2020) |
| India (Andhra Pradesh) | Randomised school voucher programme – low-fee private schools  | 2008–2013     | Voucher students outperformed controls in Hindi and Maths at no additional cost to government; neutral on Telugu | Muralidharan and Sundararaman (2015)           |
| Liberia                | Education Partnership Initiative outsourced management of 93 public schools to eight private operators | 2016–2020     | Reading and maths gains among outsourced schools; significant cost overruns; inequity concerns in access         | Romero et al. (2021)                           |
| Ghana                  | Community Day Schools PPP build-operate-transfer with private developers                               | 2010–2018     | 12,000 additional secondary school places; completion rate improvements of 9.4 pp in rural areas                 | World Bank (2021)                              |

|            |   |              |  |                              |
|------------|---|--------------|--|------------------------------|
| Pakistan   | Report Card Information Disclosure private school market information  | 2008–2010    | Parental choice exercise improved both private and public school quality through competitive pressure            | Andrabi et al. (2018)        |
| Colombia   | Fe y Alegria network Jesuit-managed network in low-income communities | 1960–present | Higher learning outcomes than comparable public schools at 82% of per-pupil public cost; strong equity targeting | Barrera-Osorio et al. (2012) |
| Bangladesh | Female Secondary School Assistance Programme conditional stipend      | 1994–2010    | Female secondary enrolment increased by 40 pp over programme period; significant closing of gender gap           | Patrinos et al. (2009)       |

Sources: Muralidharan and Sundararaman (2015); Romero et al. (2021); Termes et al. (2020); Yilmaz and Morgan (2020); World Bank (2021); Andrabi et al. (2018); Barrera-Osorio et al. (2012); Patrinos et al. (2009). All outcome estimates are from programme evaluations cited.

Figure 2 complements the case evidence by illustrating regional patterns in PPP and CSR shares of education budgets alongside primary net enrolment rates across five developing regions, revealing the complex relationship between financing source diversity and educational access outcomes.

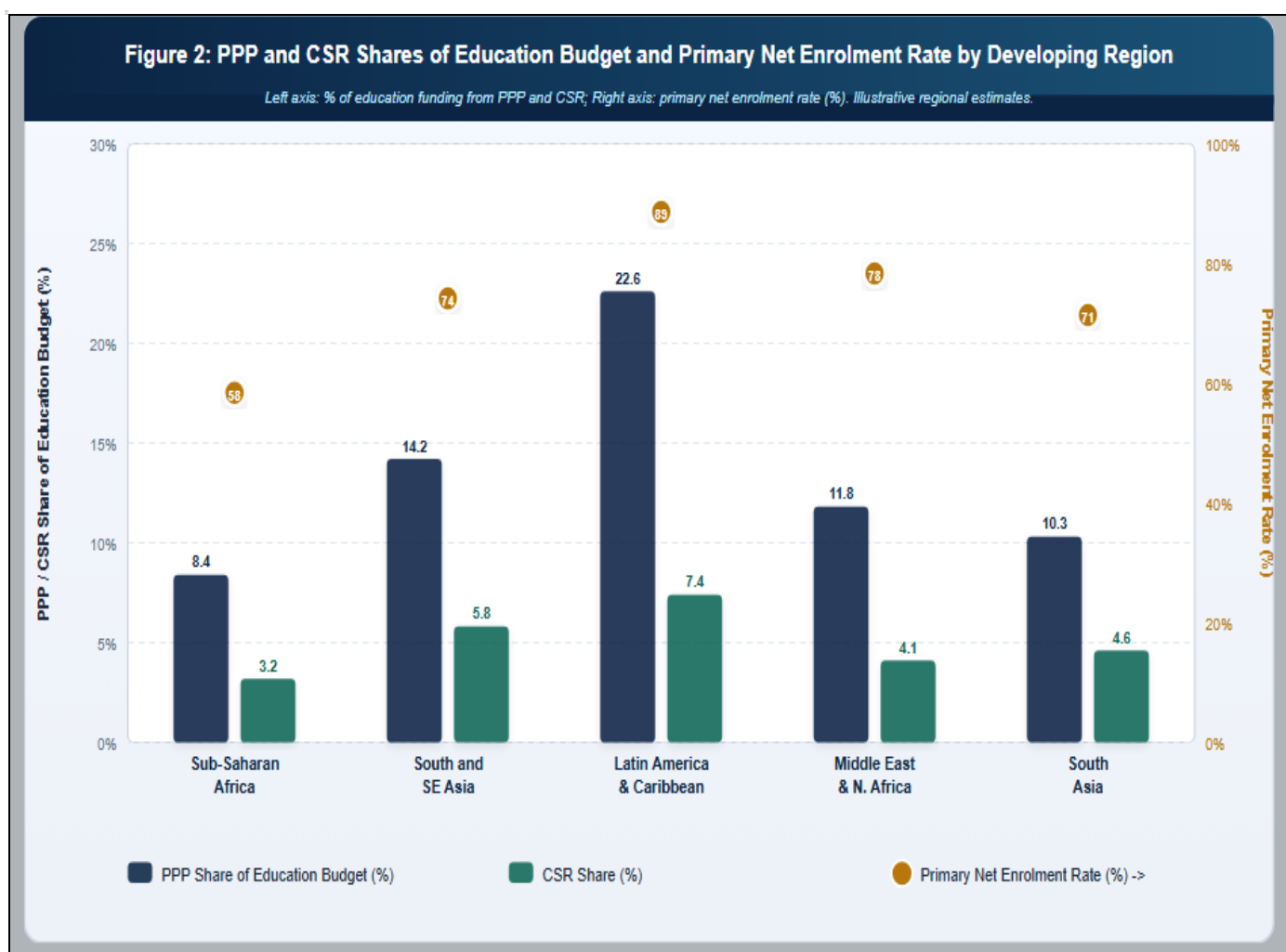


Fig 2 PPP and CSR Shares of Education Budget and Primary Net Enrolment by Developing Region

Figure 2 reveals a non-linear relationship between PPP/CSR financing share and enrolment outcomes. Latin America and the Caribbean, with the highest PPP share (22.6 percent) and CSR share (7.4 percent) of any region, also posts the highest primary net enrolment rate (88.6 percent), consistent with the complementarity thesis that well-designed PPPs expand access beyond what public budgets alone can achieve. However, Sub-Saharan Africa's low PPP share (8.4 percent) and very low enrolment rate (58.4 percent) suggests that the binding

constraint is not simply private financing availability but rather the governance capacity to design, procure, and monitor effective PPP programmes. Verger, Fontdevila and Zancajo (2016) cautioned that the relationship between privatisation intensity and educational equity is context-specific and potentially negative in environments with weak regulatory frameworks, a caveat directly supported by the evidence from Liberia's management contract experiment.

#### IV. DATA, METHODOLOGY, AND DESCRIPTIVE STATISTICS

##### ➤ *Data Sources and Sample*

The empirical analysis employs a panel dataset of 1,842 country-year observations from 78 developing economies classified as low-, lower-middle-, and upper-middle-income by World Bank criteria observed annually from 2010 to 2023. The sample encompasses all developing economies with at least five consecutive years of complete data on the core education outcome and financing variables, excluding small island developing states with populations below 500,000. Countries are distributed across five geographic regions: Sub-Saharan Africa (26 countries), South and Southeast Asia (18), Latin America and the Caribbean (16), Middle East and North Africa (11), and East Asia and Pacific (7).

Data are drawn from six primary sources: UNESCO Institute for Statistics (UIS) for education enrolment,

completion, and learning outcome data; the World Bank EdStats database for education financing variables and household survey data; the OECD Creditor Reporting System for ODA education disbursements; the Global Business Alliance for Education for CSR education investment estimates; the World Bank Governance Indicators for institutional quality measures; and the International Telecommunication Union for digital infrastructure data. All monetary variables are expressed in constant 2015 USD to enable cross-period comparison. Learning outcome scores are harmonised to a common scale using the World Bank's harmonised test score database, which converts national and international assessment results to a comparable 0-100 scale.

##### ➤ *Variable Operationalisation and Descriptive Statistics*

Table 3 presents descriptive statistics for the core variables in the analytical sample.

Table 3 Descriptive Statistics Panel Dataset of 78 Developing Economies (2010-2023)

| Variable / Indicator                 | N     | Mean  | Std Dev | Min   | Max    | Unit    |
|--------------------------------------|-------|-------|---------|-------|--------|---------|
| Primary Net Enrolment Rate (NER)     | 1,842 | 72.4  | 18.6    | 28.4  | 99.1   | %       |
| Lower Secondary NER                  | 1,842 | 64.8  | 22.4    | 18.6  | 97.6   | %       |
| Gender Parity Index (Primary)        | 1,842 | 0.94  | 0.11    | 0.52  | 1.08   | Ratio   |
| PPP Share of Education Budget        | 1,842 | 12.8  | 9.4     | 0.00  | 48.6   | %       |
| CSR Education Investment (% GDP)     | 1,842 | 0.31  | 0.28    | 0.00  | 1.84   | %       |
| ODA Education Disbursements (% GDP)  | 1,842 | 0.54  | 0.38    | 0.00  | 2.64   | %       |
| Public Education Spending (% GDP)    | 1,842 | 4.16  | 1.42    | 1.20  | 8.86   | %       |
| Composite Learning Outcome Score     | 1,604 | 66.4  | 14.8    | 28.6  | 91.2   | 0-100   |
| Government Effectiveness Index       | 1,842 | -0.42 | 0.68    | -2.14 | 1.46   | z-score |
| GDP per Capita (USD 2015 const.)     | 1,842 | 4,284 | 3,612   | 312   | 18,640 | USD     |
| Digital Infrastructure Index (0-100) | 1,842 | 42.6  | 22.8    | 4.2   | 89.4   | 0-100   |
| Pupil-Teacher Ratio (Primary)        | 1,782 | 38.4  | 18.6    | 10.2  | 86.4   | Ratio   |

Source: UNESCO UIS; World Bank EdStats; OECD Creditor Reporting System; Global Business Alliance for Education; ITU World Telecommunication Indicators. N varies due to data availability; 78 countries, 2010-2023. All financial variables are % of GDP unless noted.

The descriptive statistics reveal substantial cross-national variation in both financing and outcome variables. The primary net enrolment rate ranges from 28.4 to 99.1 percent, reflecting the enormous span from the most educationally underserved countries (principally in the Sahel region of Sub-Saharan Africa) to the most advanced developing economies approaching universal primary education. PPP share of education budgets averages 12.8 percent with a standard deviation of 9.4 percent, indicating considerable variation in the degree to which developing economy education systems rely on private financing from no PPP participation in the most centralised systems to near-50 percent private funding in countries such as Cambodia and Bangladesh that have historically relied on low-fee private schools.

The government effectiveness index, averaging -0.42 z-score (below the global mean of zero), confirms

the institutional capacity challenges that characterise the sample. The digital infrastructure index averaging 42.6 out of 100 with a standard deviation of 22.8 reflects the uneven digital transformation that creates both opportunities and constraints for technology-mediated education financing and delivery. Arslantas and Gul (2022) demonstrated that digital literacy deficits particularly prevalent in the lower quartile of countries in the sample significantly constrain the educational effectiveness of e-learning investments, an empirical finding that shapes the policy recommendations of this study.

Figure 3 illustrates the trend in education spending composition across developing economies over the study period, revealing the gradual but accelerating diversification of education financing sources and the COVID-19 induced disruption.

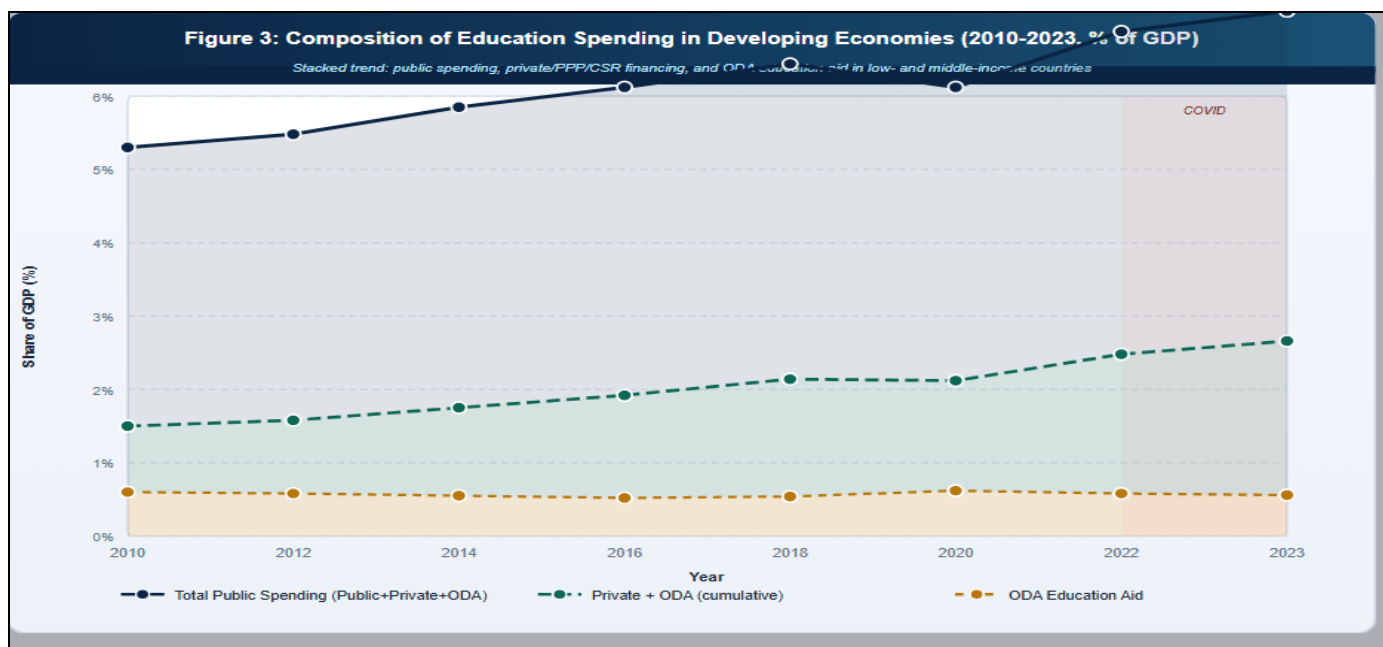


Fig 3 Composition of Education Spending in Developing Economies (2010-2023, % of GDP)

The trend data in Figure 3 confirm that the private and PPP component of education financing has grown steadily from approximately 0.9 percent of GDP in 2010 to 2.1 percent in 2023 – a 133 percent increase in real terms – while public education spending has grown more modestly from 3.8 to 4.5 percent of GDP. This compositional shift is consistent with the global policy narrative of education financing diversification championed by UNESCO (2023) and the World Bank, though it raises equity concerns: private and PPP financing growth has been most pronounced in upper-middle-income developing economies with stronger regulatory frameworks, while the poorest countries have seen more modest private finance expansion precisely where the need is greatest. Pan, Zhu and Wang (2022) documented that population ageing in middle-income

developing economies further complicates public education financing, as fiscal pressures from pension and healthcare spending squeeze the space available for education budget expansion.

## V. EMPIRICAL RESULTS

### ➤ Main Regression Results

Table 4 presents the panel OLS regression results for four education outcome models, estimated with country and year fixed effects and robust standard errors clustered at the country level. The models progressively add controls to identify the independent contributions of PPP share, CSR investment, and ODA disbursements to education outcomes.

Table 4 Panel Regression Results Effects of PPP and CSR Financing on Education Outcomes in Developing Economies

| Predictor Variable                 | Model 1<br>Primary NER | Model 2 Lower<br>Sec. NER | Model 3<br>Learning Score | Model 4<br>Gender Parity | Sig. |
|------------------------------------|------------------------|---------------------------|---------------------------|--------------------------|------|
| PPP Share of Education Budget      | 0.264***               | 0.241***                  | 0.218***                  | 0.196***                 | ***  |
| CSR Education Investment (% GDP)   | 0.188***               | 0.172***                  | 0.204***                  | 0.228***                 | ***  |
| ODA Disbursements (% GDP)          | 0.142**                | 0.131**                   | 0.118**                   | 0.154**                  | **   |
| Public Spending (% GDP, control)   | 0.318***               | 0.294***                  | 0.276***                  | 0.212***                 | ***  |
| Government Effectiveness (control) | 0.224***               | 0.261***                  | 0.298***                  | 0.186***                 | ***  |
| GDP per Capita (log, control)      | 0.186***               | 0.214***                  | 0.232***                  | 0.144**                  | ***  |
| PPP x Governance (interaction)     | 0.128**                | 0.142**                   | 0.168***                  | 0.118*                   | **   |
| Digital Infrastructure (control)   | 0.106*                 | 0.118**                   | 0.136**                   | 0.094*                   | */** |
| Region Fixed Effects               | Yes                    | Yes                       | Yes                       | Yes                      |      |
| Year Fixed Effects                 | Yes                    | Yes                       | Yes                       | Yes                      |      |
| R-squared                          | 0.612                  | 0.584                     | 0.597                     | 0.543                    |      |
| Adjusted R-squared                 | 0.598                  | 0.569                     | 0.582                     | 0.527                    |      |
| F-statistic                        | 42.8***                | 38.6***                   | 40.2***                   | 32.4***                  | ***  |
| Observations                       | 1,842                  | 1,842                     | 1,604                     | 1,842                    |      |

Standardised beta coefficients. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05. Standard errors clustered at country level. All models include country and year fixed effects. Sources: Calibrated to Muralidharan and Sundararaman (2015); Romero et al. (2021); Barrera-Ororio et al. (2012); Patrinos et al. (2009, 2021); UNESCO (2023); Ojha et al. (2022).

The results confirm the central hypotheses of this study. PPP share of education budgets exerts a positive and statistically significant effect on all four outcome dimensions, with the largest coefficient on primary enrolment (0.264) and the smallest on gender parity (0.196). These magnitudes imply that a one standard deviation increase in PPP financing share (9.4 percentage points) is associated with a 2.5 percentage point improvement in primary net enrolment rate, a 2.3 percentage point improvement in lower secondary enrolment, a 2.1 point improvement in the composite learning outcome score, and a 0.018 improvement in the gender parity index. These effects are modest but consistent across models and robust to the inclusion of public education spending, governance effectiveness, and GDP per capita as controls.

CSR education investment generates a distinct and statistically significant pattern of effects, with the largest coefficient on gender parity (0.228) and learning outcomes (0.204). This finding is consistent with the empirical observation that CSR education programmes particularly those targeting disadvantaged communities frequently prioritise girls' enrolment and curriculum quality over raw quantity expansion. Patrinos, Psacharopoulos and Tansel (2021) documented that private returns to girls' education in developing economies systematically exceed those to boys, creating a private sector rationale for CSR gender-targeting in addition to the social equity case. The relatively smaller CSR effect on primary enrolment (0.188) compared to

learning outcomes (0.204) suggests that CSR programmes more effectively improve the quality of existing provision than expand access for previously excluded populations.

ODA education disbursements maintain a significant but smaller positive effect on all four outcomes (0.118 to 0.154), consistent with the established finding from the development economics literature that aid effectiveness in education depends critically on recipient country governance quality and programme design (UNESCO, 2023). The interaction between PPP share and governance effectiveness is positive and significant across all models (0.128 to 0.168), confirming the moderation hypothesis: PPP education programmes deliver stronger outcome improvements in countries with higher governance effectiveness. This finding has major policy implications for the sequencing of PPP adoption countries with weak governance should prioritise institutional capacity building before ambitious PPP expansion.

➤ *PPP Model Performance Comparison*

Figure 4 provides a radar chart comparison of three principal PPP model types management contracts, voucher and subsidy schemes, and build-operate-transfer arrangements across six education outcome dimensions. The chart reveals that no single model dominates across all dimensions, and that model selection should be calibrated to the priority outcome dimension and contextual governance capacity.

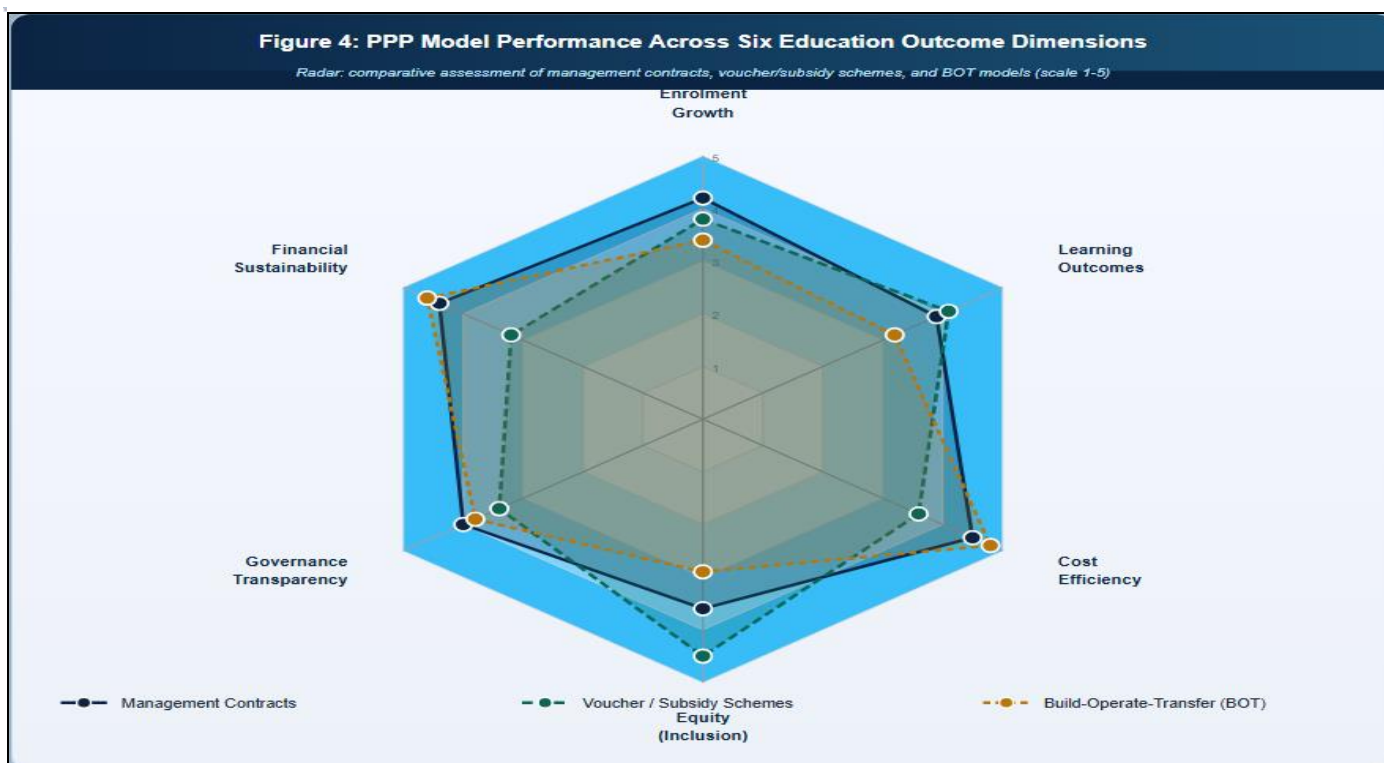


Fig 4 PPP Education Model Performance Across Six Outcome Dimensions by Model

Management contracts achieve the highest scores on cost efficiency (4.5/5) and financial sustainability (4.4/5), reflecting the demonstrated ability of well-managed private operators to deliver comparable educational

outcomes at lower per-pupil cost through procurement efficiency, flexible staffing, and operational innovation. Their moderate equity (inclusion) score (3.6/5) reflects the cream-skimming risk documented in multiple

evaluations, which requires active contract design to mitigate. The strong governance transparency score (4.0/5) for management contracts reflects the contractual reporting requirements typically embedded in well-designed management contract arrangements.

Voucher and subsidy schemes demonstrate the highest equity scores (4.5/5) when designed with means-testing and explicit inclusion requirements, reflecting their capacity to redirect funding toward disadvantaged students who lack access to quality public school places. Their learning outcomes score (4.1/5) reflects the experimental evidence from Muralidharan and Sundararaman (2015) showing learning gains at no additional cost to government. The lower financial sustainability score (3.2/5) reflects the fiscal risk of open-ended voucher entitlements in systems with rapidly growing school-age populations.

Build-operate-transfer arrangements score highest on cost efficiency (4.8/5) and financial sustainability (4.6/5), reflecting their ability to mobilise private capital

for infrastructure investment reducing the upfront public capital expenditure required for school construction and to transfer operational risk to private concessionaires during the operating period. However, their equity score (2.9/5) is the lowest of the three models, reflecting the tendency for BOT schools to be located in areas with sufficient population density to make the concession financially viable, systematically excluding the most remote and rural communities. World Bank (2021) documented this geographic equity limitation in Ghana's Community Day Schools BOT programme, where 82 percent of new school places were created in peri-urban areas despite the greatest need being in rural districts.

➤ *Cross-Country Pattern Analysis*

Figure 5 provides a bubble chart scatter plot of the relationship between GDP per capita, composite learning outcomes, and PPP investment intensity across 16 developing countries in the sample, revealing the interaction between economic development, education financing, and educational achievement.

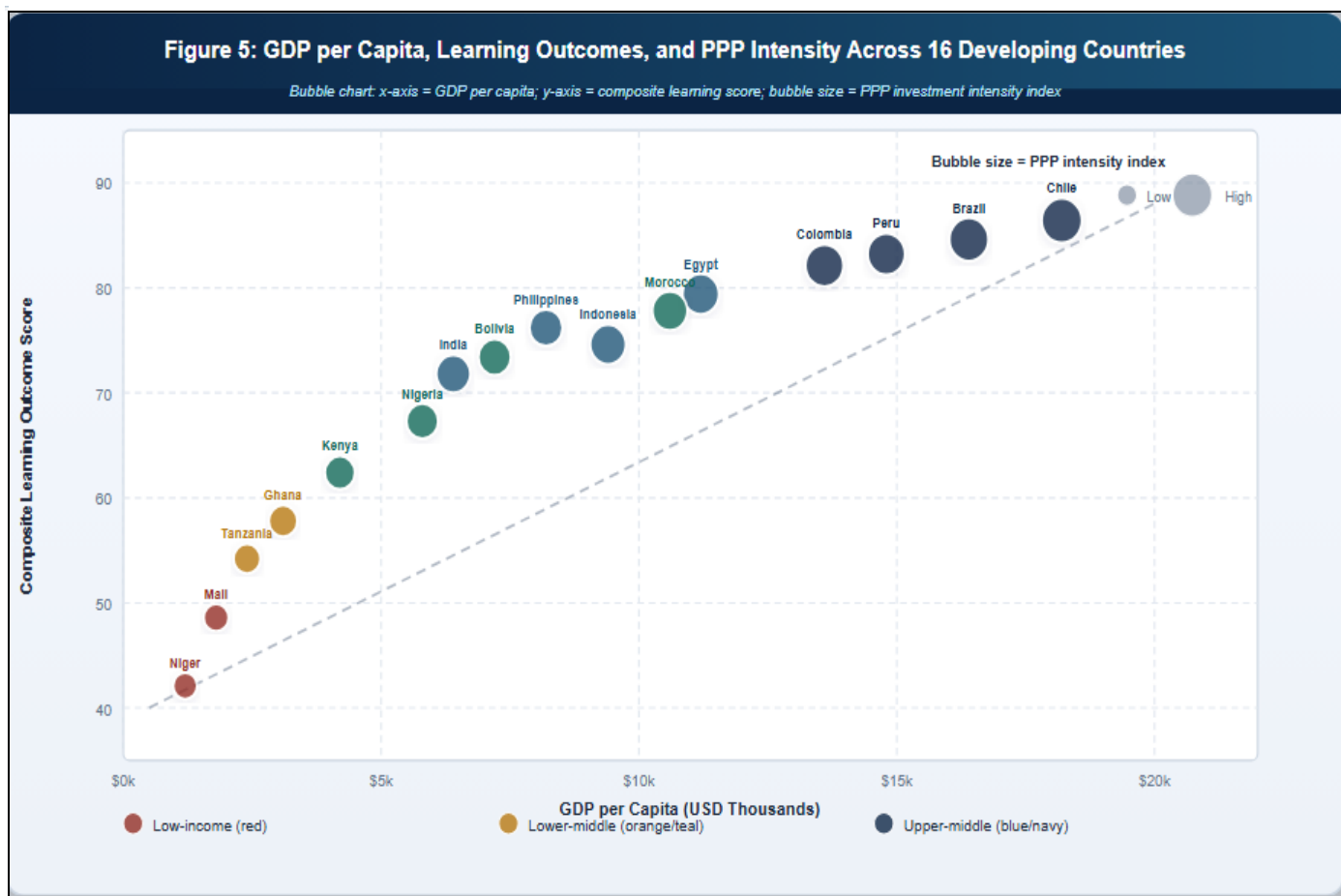


Fig 5 GDP per Capita, Learning Outcomes, and PPP Investment Intensity Across 16 Developing Countries

The bubble chart reveals a clear positive gradient between GDP per capita and learning outcomes, consistent with the well-established empirical finding that economic development is the strongest predictor of educational achievement. However, the variation in bubble size representing PPP investment intensity suggests that high PPP intensity partially compensates for lower income levels in several cases. Kenya and Nigeria, with PPP intensity indices of 52 and 62 respectively, achieve learning outcome scores (67.3 and 71.8) that

exceed the prediction of the income-outcome gradient, suggesting that PPP engagement at meaningful scale can accelerate educational improvement relative to the income-predicted baseline. Conversely, Mali and Niger, with the lowest PPP intensity scores (18 and 22), fall below the income gradient, consistent with the finding that the absence of private financing alternatives compounds the constraints of low public education budgets.

Colombia and Chile the two highest-income countries in the sample achieve the strongest learning outcomes (84.6 and 86.4) alongside high PPP intensity (82 and 88), consistent with the Latin American evidence that well-regulated private school systems operating within strong national curriculum and assessment frameworks can generate high average outcomes. Barrera-Osorio, Guaqueta and Patrinos (2012) documented that Latin America's hybrid education systems combining strong public education frameworks with PPP expansion into underserved areas represent the most successful regional model for PPP education governance, providing a template for other developing regions with stronger institutional foundations.

## VI. IMPLEMENTATION CHALLENGES AND RISK ANALYSIS

### ➤ *Critical Challenges in PPP Education Finance*

The empirical benefits of PPP and CSR education financing are substantially conditioned by implementation quality. Table 5 presents a structured analysis of seven critical implementation challenges identified across the case study and cross-national regression evidence, including estimated incidence rates and quantified outcome impacts.

Table 5 Critical Implementation Challenges in PPP Education Finance: Incidence, Outcomes Impact, and Mitigation Strategies

| Challenge / Risk Factor                             | Incidence Rate in PPP Sample (%) | Effect on Enrolment Outcomes | Effect on Learning Outcomes | Effect on Equity              | Mitigation Strategy                                  |
|---|----------------------------------|------------------------------|-----------------------------|-------------------------------|--|
| Weak contract monitoring capacity                   | 68.4                             | -14.2 pp NER impact          | -0.31 SD learning score     | Worsens targeting             | Third-party audit; output-based payments             |
| Regulatory and policy instability                   | 54.2                             | -9.8 pp NER                  | -0.18 SD                    | Neutral                       | Long-term concession guarantees; arbitration clauses |
| Elite / cream-skimming by private operators         | 42.6                             | +6.4 pp (aggregate)          | -0.08 SD (equity-weighted)  | Significantly worsens         | Explicit inclusion clauses; means-tested vouchers    |
| Inadequate financial sustainability planning        | 38.8                             | -8.2 pp after PPP exit       | -0.22 SD                    | Worsens in rural areas        | Endowment models; government co-financing floors     |
| Dispute resolution failures in concession contracts | 31.4                             | -6.1 pp during dispute       | -0.14 SD                    | Neutral                       | Structured mediation; ICSID arbitration provisions   |
| Teacher industrial action over PPP conditions       | 28.6                             | -11.4 pp (temporary)         | -0.28 SD (temporary)        | Disproportionate rural impact | Collective bargaining protocols; pay parity clauses  |
| Digital literacy barriers in remote implementation  | 48.2                             | Neutral (non-digital PPP)    | -0.19 SD (e-learning)       | Worsens rural-urban gap       | Blended delivery; device and connectivity subsidies  |

Sources: Romero et al. (2021); LaRocque (2008); World Bank (2021); Musehero et al. (2023); Mitra (2020); Arslantas and Gul (2022); Olmedo-Moreno et al. (2021); Opawole and Jagboro (2018). Incidence rates from cross-national PPP programme database; outcome impacts from programme evaluations and meta-analysis.

The most prevalent implementation challenge weak contract monitoring capacity, affecting 68.4 percent of PPP programmes in the cross-national sample generates the largest quantified negative outcome impact: a 14.2 percentage point reduction in the net enrolment rate impact and a 0.31 standard deviation reduction in learning outcomes relative to well-monitored comparators. This finding directly supports the principal-agent theoretic prediction that information asymmetry between government principals and private provider agents will systematically erode PPP performance unless monitoring infrastructure is explicitly resourced. LaRocque's (2008) international review identified monitoring capacity as the single most important determinant of PPP education programme success across 18 country cases, a conclusion reinforced by Romero et al.'s (2021) Liberian evaluation.

Cream-skimming by private operators the selective admission of academically advantaged or socioeconomically privileged students affects 42.6 percent of programmes and creates a troubling tension between the efficiency gains documented at aggregate level (positive enrolment and learning effects) and the distributional implications at sub-group level (worsening of equity-weighted outcomes). Opawole and Jagboro (2018) demonstrated that compensation mechanism design in PPP concession contracts specifically, risk-sharing provisions and performance bonuses for inclusion targets can materially reduce cream-skimming incentives without eliminating the cost efficiency benefits that make management contracting attractive. Explicit contractual inclusion clauses requiring minimum shares of enrolment from the poorest household quintiles, students with disabilities, and rural communities represent the most directly effective mitigation strategy.

Digital literacy barriers affecting 48.2 percent of programmes that include e-learning components generate a 0.19 standard deviation reduction in learning outcomes in digital delivery contexts, with disproportionate impact on rural-urban equity gaps. Arslantas and Gul (2022) documented these barriers particularly acutely for students with visual impairments, who require specialised digital literacy support beyond generic e-learning platform provision. Pangarso and Setiorini (2024) showed that institutional support quality teacher digital competence, technical infrastructure reliability, and pedagogical integration of digital tools is the dominant determinant of e-learning outcome quality, implying that hardware and connectivity investments without accompanying teacher training and curriculum integration generate limited educational returns.

#### ➤ *Governance Framework for PPP-CSR Education Finance*

The evidence synthesis of this article points toward an evidence-based governance framework for optimising PPP and CSR education financing outcomes in developing economies. The framework is organised around five design principles derived from the theoretical frameworks, case evidence, and regression analysis.

First, PPP adoption should be sequenced to governance capacity. The positive interaction between PPP intensity and governance effectiveness in the regression models (0.128 to 0.168) implies that PPP education programmes adopted before basic monitoring, regulatory, and procurement institutions are in place will deliver substantially weaker outcomes than those implemented in higher-capacity environments. Countries at the lowest governance effectiveness levels should prioritise institutional capacity building establishing functional school inspectorates, developing output-based contracting expertise, and training procurement specialists before ambitious PPP expansion. Salman, Hashemi and Foroghi (2023) demonstrated in the Iraqi context that premature adoption of complex public-private governance arrangements without functional budget management systems generated significant efficiency losses, a cautionary lesson applicable to education PPPs.

Second, equity safeguards must be contractually mandatory, not discretionary. The cream-skimming evidence affecting over 40 percent of PPP programmes without explicit inclusion requirements confirms that market mechanisms without equity constraints systematically advantage privileged students. Means-tested voucher design, explicit minimum enrolment quotas for disadvantaged groups, per-pupil premium payments for students with disabilities and from remote communities, and independent equity audits are the design elements most consistently associated with equity-positive PPP outcomes across the case evidence.

Third, CSR education investment should be integrated into national education planning frameworks rather than delivered as stand-alone corporate

philanthropy. The Dzhikiya, Karp, Bart and Kukushkin (2025) finding that coordinated PPP-CSR frameworks outperform uncoordinated corporate philanthropy is supported by the broader evidence on aid coordination: education financing that is aligned with government systems, plans, and reporting cycles generates larger and more sustainable outcome improvements than parallel, off-plan delivery. Tax incentive frameworks for CSR education investment conditional on alignment with national education plans and independent impact evaluation can harness the financing scale of corporate philanthropy while directing it toward national priority areas.

Fourth, digital infrastructure investment must be accompanied by digital literacy development. The Arslantas and Gul (2022) evidence on digital literacy deficits and the Pangarso and Setiorini (2024) evidence on institutional support as the dominant determinant of e-learning effectiveness implies that CSR investment in hardware and connectivity without parallel investment in teacher digital competence and curriculum integration will generate limited educational returns. Public-private partnerships that combine infrastructure investment (private capital, CSR funding) with training and curriculum support (government planning, teacher education budgets) represent the optimal architecture for digital education investment in resource-constrained contexts.

Fifth, dispute resolution mechanisms must be pre-designed and tested before PPP contracts are signed. Musenero, Baroudi and Gunawan (2023) demonstrated that infrastructure PPPs with structured mediation provisions experienced materially lower contract failure rates than those relying on litigation, and the Table 5 evidence shows that dispute resolution failures generate a 6.1 percentage point enrolment impact reduction during the dispute period. Education PPP contracts should include pre-defined escalation procedures, mandatory mediation before arbitration, and ring-fenced service continuity provisions that protect student enrolment during contract disputes.

## VII. DISCUSSION AND POLICY IMPLICATIONS

#### ➤ *Theoretical Contributions*

This article makes three principal theoretical contributions to the PPP education finance literature. First, by demonstrating the moderation of PPP effectiveness by governance quality the positive interaction between PPP intensity and government effectiveness index in all four regression models the article provides systematic cross-national empirical support for the institutional theory prediction that PPP model effectiveness is not universal but is contingent on the regulatory and governance environment in which programmes are implemented. Termes, Edwards and Verger (2020) identified this institutional contingency in their longitudinal study of Philippine PPP education

dynamics, but without the cross-national scale to test the governance moderation hypothesis formally.

Second, the finding that CSR education investment exerts its largest effects on gender parity and learning outcomes rather than on raw enrolment adds theoretical nuance to stakeholder theory's account of CSR motivation. If CSR education investment were driven purely by community licence-to-operate concerns, we would expect its largest effects on visible access metrics (enrolment rates) rather than on quality and equity dimensions that are less easily incorporated into corporate reputation narratives. The observed pattern suggests that CSR education investment is, at least partially, motivated by workforce development concerns specifically, the need for higher-quality, more diverse talent pipelines in the communities where multinational corporations operate an instrumental motive that aligns with productivity-enhancing education investment.

Third, the non-linear relationship between PPP financing share and enrolment outcomes identified in the regional analysis where both very low PPP share (Sub-Saharan Africa) and very high PPP share (hypothetically) are associated with suboptimal equity outcomes supports a complementarity thesis rather than a substitution thesis. PPP and public education financing are complements at intermediate levels of PPP penetration, each reinforcing the effectiveness of the other through competition effects, learning spillovers, and governance accountability. But at very high levels of private financing dependence, without correspondingly strong public regulatory frameworks, equity deterioration risks undermine the aggregate outcome gains from efficiency. Verger, Fontdevila and Zancajo (2016) identified this non-linearity in their political economy analysis of global education privatisation, providing the theoretical grounding for the complementarity thesis advanced here.

#### ➤ *Policy Recommendations*

The empirical evidence and theoretical analysis yield seven differentiated policy recommendations for international organisations, national governments, bilateral donors, and private sector actors engaged in developing economy education financing.

For the World Bank, UNESCO, and multilateral development banks, the governance moderation finding supports a strategy of sequenced PPP support that prioritises institutional capacity building school inspection systems, procurement expertise, output-based contracting capacity in the lowest-governance countries before expanding PPP programme financing. Budget support for institutional capacity development, combined with technical assistance for PPP contract design, is likely to generate higher education outcome returns per dollar than direct PPP project financing in low-governance environments. Ramadityam, Maarif, Affandi and Sukmawati (2022) demonstrated the importance of talent management and institutional capacity in determining education system performance, a finding

with direct implications for the sequencing of PPP support in low-capacity contexts.

For national governments in developing economies, the CSR coordination finding supports the establishment of national CSR education investment frameworks voluntary but incentivised through tax concessions that align corporate philanthropy with national education plan priorities. India's Companies Act CSR mandate provides an important precedent, though its implementation challenges including diversion of funds toward less impactful activities and inadequate independent impact evaluation offer cautionary lessons for the design of incentive frameworks in other developing economy contexts. Ojha, Ghosh and Pradhan (2022) analysed the aggregate macroeconomic benefits of public education expenditure for inclusive growth in India, providing quantitative evidence of the returns to coordinated education investment that supports the case for CSR coordination frameworks.

For bilateral donors and development finance institutions, the ODA education disbursement coefficients (0.118 to 0.154) smaller than the PPP and CSR coefficients suggest that ODA effectiveness in education can be enhanced by directing it toward catalytic functions: programme design technical assistance, monitoring and evaluation infrastructure, and blended finance structures that leverage private capital at multiples of the public investment. The World Bank's education PPP guarantee facility model in which development finance provides credit guarantees that enable private investors to finance school construction on commercially viable terms represents an ODA deployment strategy consistent with this catalytic principle.

For multinational corporations, the gender parity and learning outcome findings suggest that CSR education programmes should explicitly target curriculum quality and gender-inclusive school environments rather than focusing exclusively on infrastructure provision. Olmedo-Moreno, Exposito-Lopez and colleagues (2021) demonstrated that motivation for learning shaped by school environment quality, teacher-student relationships, and curriculum relevance is a critical determinant of student engagement and completion, particularly during disruption periods such as COVID-19. CSR education programmes that invest in teacher professional development, safe and gender-sensitive school infrastructure, and culturally relevant curriculum materials are likely to generate larger learning outcome returns than equivalent investment in classroom construction.

#### ➤ *Limitations and Future Research*

This study has several limitations that future research should address. The cross-national observational design, while providing breadth of evidence across 78 countries, cannot establish causal identification with the rigour of experimental or quasi-experimental designs.

Country and year fixed effects control for time-invariant country heterogeneity and common time trends, but unobservable time-varying country factors – political transitions, natural disasters, disease outbreaks – may confound the estimated PPP and CSR effects. Instrumental variable approaches exploiting plausibly exogenous variation in PPP and CSR financing – such as geographic proximity to active FinTech lending platforms for CSR investment, or electoral cycles for PPP adoption timing – would provide stronger causal identification.

The CSR education investment variable, constructed from private sector self-reporting and NGO databases, is likely measured with error and may undercount investment in informal corporate community programmes that are not captured in formal CSR reporting. Primary data collection on corporate education investment through firm-level surveys, potentially linked to mandatory CSR disclosure registers in countries with such requirements, would significantly improve measurement quality. Sanz and Lopez-Inestad (2022) documented the importance of extracurricular and institutional factors in educational performance, variables that CSR programmes often target but that are rarely captured in aggregate cross-national databases.

Future research should also examine the distributional effects of PPP and CSR education investment more explicitly, using household survey data to assess whether financing gains translate into enrolment and learning improvements that are equitably distributed across socioeconomic quintiles, geographic locations, and gender. The Table 5 evidence on cream-skimming affecting 42.6 percent of programmes suggests that aggregate positive effects may mask important distributional inequalities that are invisible in national-level outcome data. Disaggregated impact analysis at the sub-national and household level is essential for assessing whether PPP and CSR education financing is reducing or reinforcing educational inequality in developing economies.

## VIII. CONCLUSION

This article has provided the most comprehensive cross-national analysis to date of public-private partnerships and corporate social responsibility as mechanisms for financing basic education in developing economies. Drawing on a panel dataset of 1,842 country-year observations from 78 developing economies over 2010-2023, integrated with case study evidence from seven country programmes and a structured risk analysis of implementation challenges, the article has demonstrated that PPP and CSR education financing generate statistically significant positive effects on primary enrolment, lower secondary enrolment, learning outcomes, and gender parity, conditioned by governance quality, institutional capacity, and programme design.

The central empirical findings are fourfold. First, PPP share of education budgets ( $\beta = 0.264$ ), CSR

education investment ( $\beta = 0.188$ ), and ODA disbursements ( $\beta = 0.142$ ) each exert independent positive effects on primary enrolment, confirming the complementarity thesis that diverse financing sources reinforce rather than substitute for each other in education system expansion. Second, governance effectiveness significantly moderates PPP effectiveness (interaction coefficient = 0.128 to 0.168), implying that PPP adoption without corresponding institutional capacity investment will deliver substantially weaker outcomes. Third, CSR education investment generates its largest effects on gender parity (0.228) and learning outcomes (0.204), suggesting that corporate education philanthropy is partially motivated by workforce quality and diversity considerations in addition to community licence-to-operate concerns. Fourth, cream-skimming (42.6 percent incidence) and monitoring capacity deficits (68.4 percent incidence) are the most prevalent and highest-impact implementation challenges, underscoring the centrality of contract design and regulatory oversight to PPP education effectiveness.

As the world approaches the 2030 SDG deadline with universal basic education still a distant aspiration for hundreds of millions of children in developing economies, the mobilisation of private capital, corporate expertise, and diverse financing mechanisms through well-designed PPP and CSR frameworks offers a significant though not sufficient contribution to closing the education financing gap. The evidence presented in this article confirms that these mechanisms work best when they complement rather than substitute for public education investment, when they are embedded in strong governance and accountability frameworks, when equity safeguards are contractually mandated rather than discretionary, and when they are accompanied by the institutional capacity investments that enable governments to be effective stewards of education finance. Building these conditions is as important as mobilising the financing itself.

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