



Côte d'Ivoire

DATA MUST SPEAK

Unpacking Factors Influencing School Performance

UNICEF Innocenti – Global Office of Research and Foresight

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Executive summary

Executive summary

To address the challenges facing its education system, Côte d'Ivoire needs to go beyond a traditional sector analysis and analyse existing data in greater depth to find innovative solutions. To do so, Côte d'Ivoire has requested UNICEF's support, as part of the global Data Must Speak initiative, to identify positive deviant practices and behaviours.

The first stage of this research was to collect administrative data to analyse the links between school inputs and students' educational performance. This report summarizes the administrative data analysis, including data from the Education Management Information System (EMIS) and from testing.

The key findings of the first stage of the research are as follows:



The education sector in Côte d'Ivoire faces many challenges, including retention, primary-to-secondary transition and teaching quality. In 2020, it was estimated that 24.5 per cent of students who attended the first year of primary school (CP1) would not remain in school until the final year (CM2). In addition, the rate of progression from primary to secondary school, which had improved rapidly between 2008 and 2019 (from 46.1 to 85.2 per cent), is currently declining. This regression is linked to the drop in the end of primary school exam (CEPE) pass rate observed since 2021 (52.3 per cent in 2021 versus 84.5 per cent in 2019). Regarding the quality of education, only 40.4 per cent of students in CM2 have an adequate level in French and just 15 per

cent have an adequate level in mathematics, according to the 2019 Programme for the Analysis of Education Systems (PASEC) survey. This is the second-lowest performance among the participant countries.



Girls outperform boys in both promotion and CEPE pass rates. There is a positive correlation between the increased presence of female teachers in a school and these outcomes. In addition, dropouts are less frequent in female-led schools.



Having more teachers with a bachelor's degree or higher is associated with better promotion and examination pass rates. The relationship between teacher status and student academic performance is less clear, but the presence of regular teachers¹ is associated with a higher CEPE pass rate.

¹ Regular teachers are recruited at the bachelor's level or higher, or have passed the regular teacher competitive exams. Assistant teachers also make up a large proportion of educators. They are recruited at the Lower Secondary Completion Certificate (BEPC) level.



The lack of teachers affects student performance. Larger class sizes are associated with lower promotion and exam pass rates. Uneven allocation of teachers to schools also affects student outcomes, as some schools have fewer teachers than others and therefore have very large classes.



Other observable school characteristics appear to have little effect on academic performance. Our models do not detect any correlation between the presence of a library and improved results. Although the presence of a canteen is positively associated with exam results, it is negatively correlated with the promotion rate.

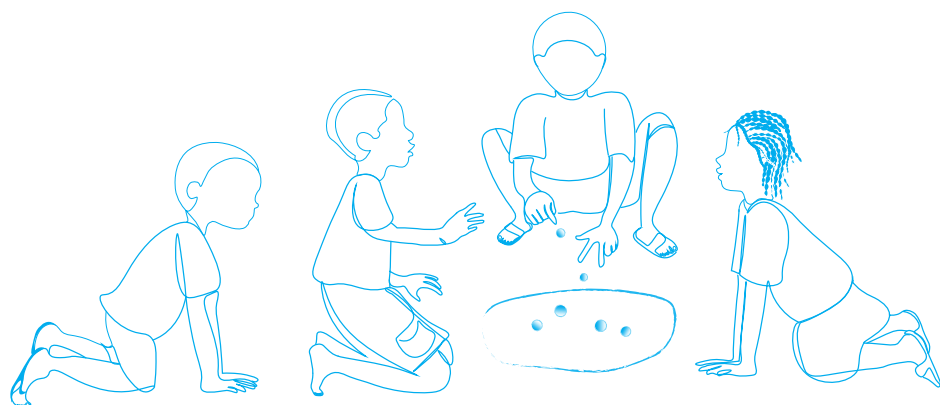


The availability of textbooks or school kits² is associated with better promotion and exam pass rates.

This first phase of the Data Must Speak research in Côte d'Ivoire allowed us to describe the education system and to prepare for Stage 2, which involves selecting positive deviant schools (i.e., those that outperform other schools operating in similar contexts). Qualitative and quantitative surveys will be conducted in these schools and in control schools. This will enable more in-depth analysis of performance factors in the Ivorian education system, identifying behaviours and practices that have a positive effect on student performance.



The presence of a mothers of female pupils club (CMEF in French) seems to help reduce the dropout rate for girls.



² School kits are distributed free of charge. Their contents vary slightly depending on the child's grade, but they generally include a backpack, notebooks, boxes of coloured pencils, pens, geometry materials and slates.





1. Introduction

Introduction: DMS Research in Côte d'Ivoire

Funded by the Jacobs Foundation, and in collaboration with the Ministry of Education and Literacy (MENA), Côte d'Ivoire has been receiving United Nations Children's Fund (UNICEF) support to implement the Data Must Speak (DMS) initiative since 2021. This DMS research combines quantitative and qualitative approaches and focuses on analysing performance factors in the Ivorian education system. It is particularly interested in 'positive deviant schools', i.e., schools that achieve exceptional results given the context in which they operate and the resources available to them.

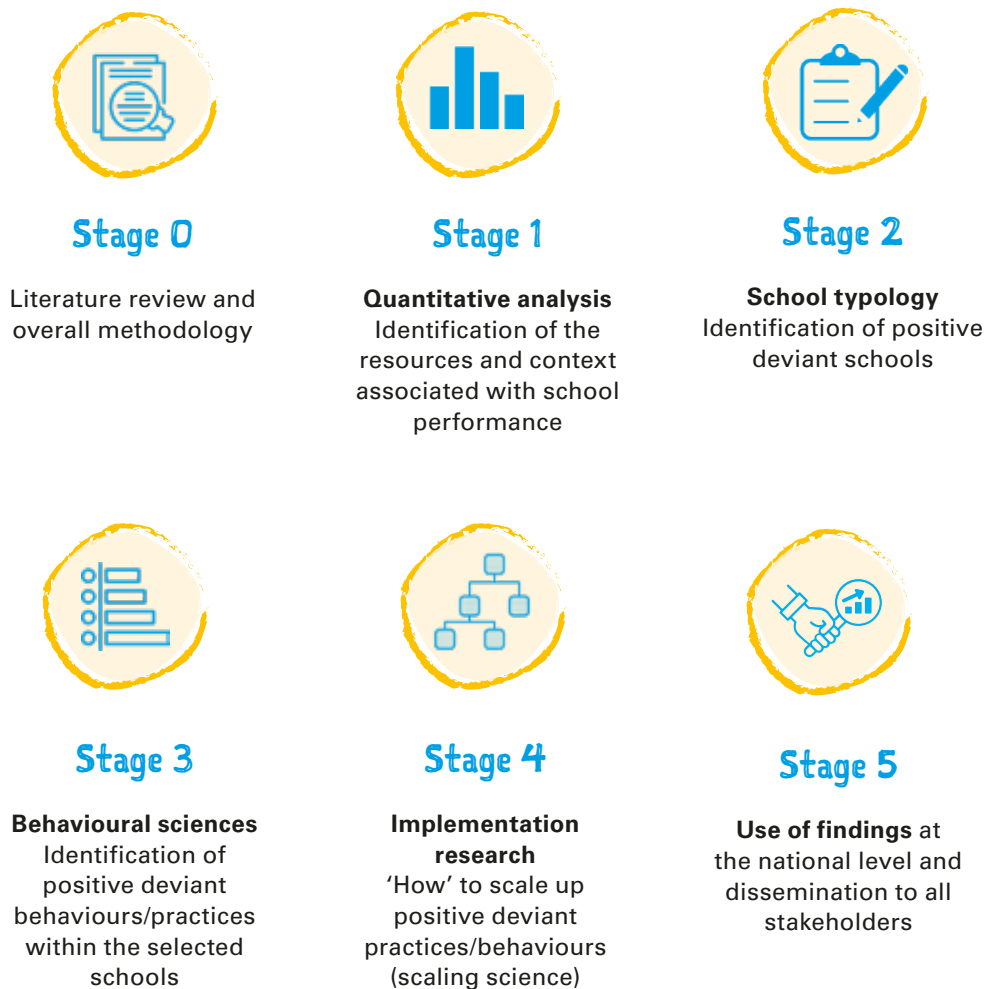
A technical team and advisory group were established to implement research activities, while a co-creation workshop between MENA and UNICEF identified research options and created the road map. This report is the result of Stage 1 of the DMS research in Côte d'Ivoire: **analysing performance factors in the Ivorian education system**. The remainder of the report will describe the research stages and questions that this analysis aims to answer, present an overview of education and recent reforms in Côte d'Ivoire, describe the research methodology used, present and discuss the findings of the econometric modelling, and suggest ways to improve the education system.

1. Overview of the DMS research: phases and objectives

In partnership with MENA, the DMS research aims to document the performance factors in the Ivorian education system. The research comprises four stages, carried out jointly with MENA experts and researchers from UNICEF Innocenti – Global Office of Research and Foresight (see **Figure 1**). Stage 1, which is outlined in this report, involved a quantitative analysis of administrative data from the education system to identify which school input factors are correlated with improved student performance. The next stages will be to select positive deviant schools (Stage 2) and conduct qualitative and quantitative surveys within these schools (Stage 3) to identify positive deviant practices and behaviours that lead to good outcomes in Côte d'Ivoire. The DMS research in Côte d'Ivoire should conclude with Stage 4, which will analyse how to scale up the practices and behaviours identified.



Figure 1: Stages of the Data Must Speak research in Côte d'Ivoire



This report aims to inform education policy decisions in Côte d'Ivoire by analysing the relationships between educational inputs and school performance, based on the administrative data available. During consultations with MENA and UNICEF experts on the objectives and scope of this report, it was decided that analysis would

focus on the primary level, given the critical role this level plays in achieving education for all, and given the time and resources available to the technical team. The technical team and UNICEF researchers devised the research questions based on data availability and issues relevant to MENA.

They guide the analyses presented in this report and are as follows:

Question 1	1.a What factors influence the quality of teaching?
	1.b What school inputs have the greatest effect on student learning?
Question 2	2.a How can we promote equitable and inclusive access to education?
	2.b What factors reduce dropout and repetition?
	2.c How can we improve access to education for girls and prevent them from out?
Question 3	Do poor school conditions for students, such as a lack of seats, have an effect on academic performance?





2. The education system in Côte d'Ivoire

The education system in Côte d'Ivoire

The Ivorian education system is based on the French education model. Schooling is compulsory for children aged 6 to 16 years. Basic education includes preschool education, primary education (also called the 'primary cycle') and general secondary education, which is divided into lower and upper cycles. The Ivorian education system also includes technical education, vocational training, higher education, and adult literacy and education.

The primary cycle lasts six years, from the age of 6 to 11 years, and is organized in three sub-cycles, each lasting two years: the preparatory stage (first and second years – CP1 and CP2), the elementary stage (third and fourth years – CE1 and CE2) and the intermediary stage (fifth and sixth years – CM1 and CM2). This cycle leads to the end of primary school exam (CEPE), which allows students to move to the first cycle of secondary school (general or vocational) (see **Table 1**).

Table 1: Ivorian education system

Age	Level	Grade	Examination
3–5	Preschool		
6	Primary	CP1	
7		CP2	
8		CE1	
9		CE2	
10		CM1	
11		CM2	CEPE
12	Secondary	6 ^e (Year 1 of lower secondary)	
13		5 ^e (Year 2 of lower secondary)	
14		4 ^e (Year 3 of lower secondary)	
15		3 ^e (Year 4 of lower secondary)	BEPC
16		2 ^{de} (Year 1 of upper secondary)	
17		1 ^{re} (Year 2 of upper secondary)	
18		Terminale (Year 3 of upper secondary)	Baccalaureate
19–23	Higher education		

1. Challenges facing the Ivorian education system

Since the adoption of the compulsory schooling policy and the accompanying measure relating to free education through the distribution of school kits,³ the education system has undergone various improvements. However, there are still challenges in ensuring equitable and inclusive access to education and in improving the quality of student learning outcomes.

For example, data from the Multiple Indicator Cluster Survey (MICS) conducted in Côte d'Ivoire (MICS, 2016) show that only 76.8 per cent of children aged 6 to 11 years attended primary school in 2016. There were large disparities between girls and boys (74.1 per cent and 79.4 per cent, respectively), rural and urban areas (70.9 per cent and 85.3 per cent, respectively), and the poorest and richest quintiles' attendance (61.9 per cent and 93.6 per cent, respectively). Families sometimes encounter difficulties if the child does not have a birth certificate, which can result in the child being refused entry into CP1 or not being able to sit the CEPE. Overall, only 70.9 per cent of girls and 72.5 per cent of boys under the age of 5 years had a birth certificate according to the MICS, and this rate is much lower in rural areas (60.1 per cent) than in urban areas (89.8 per cent).

Nevertheless, the gross enrolment rate in primary education has grown rapidly in recent years, indicating good access to schooling (from 73 per cent in 2008 to 100 per cent in 2020 according to the United Nations Educational, Social and Cultural Organization [UNESCO] Institute for Statistics). Over the same period, according to analyses by the MENA Department of Studies, Planning and Statistics (DESPS)⁴ (Department of Studies, Planning and

³ School kits are distributed free of charge. Their contents vary slightly depending on the child's grade, but they generally include a backpack, notebooks, boxes of coloured pencils, pens, geometry materials and slates.

⁴ Formerly the Department of Strategies, Planning and Statistics.

Statistics, 2020), the promotion rate to the next grade in primary school increased from 71.2 per cent to 86.1 per cent –partially due to a decline in repetition rates from 18.8 per cent to 9.2 per cent, as well as a decline in the dropout rate from 9.8 per cent to 4.7 per cent. Access to schooling and retention are therefore improving rapidly, but the cumulative primary-school dropout rate remains high. In 2020, 24.5 per cent of students entering CP1 did not reach the CM2 level. Also noteworthy is the rapid improvement in the primary-to-secondary transition rate, which increased from 46.1 per cent in 2008 to 85.2 per cent in 2019. Therefore, the transition of students from primary to secondary school is no longer the bottleneck it was a few years ago, but the recent drop in the CEPE pass rate (52.3 per cent in 2021 versus 84.5 per cent in 2019) could derail this progress.

The second challenge identified relates to education quality in Côte d'Ivoire. The latest Programme for the Analysis of Education Systems (PASEC) report from the Conference of Ministers of Education of French-speaking States and Governments (CONFEMEN) (PASEC, 2020) revealed that Côte d'Ivoire had some of the lowest learning outcomes in French-speaking Africa. At the end of CP2, 68 per cent of children reach a sufficient level in mathematics, but only 33.1 per cent reach this level in French. This result in French places Côte d'Ivoire in twelfth place out of the 14 countries analysed by PASEC. Conversely, based on spending per primary school student, Côte d'Ivoire is among the three countries investing the most in education.⁵ In CM2, the situation is no better, with only 40.4 per cent of students demonstrating a sufficient level in French and only 15 per cent in mathematics. Compared with the other countries surveyed by PASEC, Côte d'Ivoire is below average for mathematics and French.



The compulsory schooling policy and Education and Training Sector Plan

The compulsory schooling policy was adopted in 2015, requiring parents to enrol all of their children aged 6 to 16 years, both boys and girls. This policy responds to the demand for education in Côte d'Ivoire in the context of school for all (Education and Training Sector Plan, 2017).

The Education and Training Sector Plan 2016–2025 was developed shortly after, in 2017. This document describes how the strategic focus on accelerating the development of education will be put into operation. It is based on the education system's different sectors and on the development of basic education (from primary to lower secondary, i.e., 10 years of study for basic education). One of the issues addressed concerns developing the curriculum around core knowledge and skills.

⁵ Data on expenditure per primary student as a percentage of gross domestic product (GDP) per capita were obtained from the UNESCO Institute for Statistics. Data on GDP per capita in purchasing power parity (PPP) were obtained from the World Bank. Among the countries analysed by PASEC, the three highest spenders are Gabon with \$737 PPP (latest available data: 2011), Côte d'Ivoire with \$684 PPP (2018), and the Republic of the Congo with \$625 PPP (2010). Senegal ranks fourth, with expenditure of \$369 PPP. Data accessed in October 2022.

MENA identified the following support measures to improve the quality of learning:



Construction of school infrastructure for the preschool, primary and general secondary cycles



Definition of a financing strategy and plan to scale up pilot projects with a significant effect on improving learning quality and reducing inequalities in skills acquisition



Acquisition of textbooks in key subjects (reading and arithmetic) and school kits for disadvantaged families



Improving school governance, addressing gender and inclusion issues, and improving primary-school learning (literacy and arithmetic)



Establishment of a textbook loan-rental system for secondary-school students



Implementation of measures to support girls' learning in mathematics and science

The Ivorian education system is at a key point in its history, marked by rapid progress in access to education. However, achieving the goal of education for all remains a long way off, and major challenges still need to be met to enable students to acquire basic knowledge. In response, MENA called for the États généraux de l'éducation nationale et de l'alphabétisation (EGENA) [Assembly on National Education and Literacy] to be established in 2021, with the aim of building a sustainable social pact to ensure that Ivorian schools are dedicated to students' success and transmit national values.



3. Modelling of school performance factors

Modelling of school performance factors



1. Descriptive statistics

The analyses included in this report are based on the MENA Department of Studies, Planning and Statistics administrative database, namely the EMIS, available for the years 2017/18 to 2021/22 for all public, private and community primary schools in Côte d'Ivoire. The data used are submitted by head teachers at the beginning of the school year and entered by the Department of Studies, Planning and Statistics. See **Appendix 5** for further details on the data-collection process. The descriptive statistics table in **Appendix 1** presents the averages of the performance and context variables at the national level, in urban and rural areas, by education system and by student gender.

A. Performance variables

Our analysis aims to understand which factors influence school performance. We therefore began by defining performance variables that can be calculated from EMIS data:

- **Retention and progression** variables that capture the system's ability to move students from CP1 to CM2, avoiding dropouts and repetition. To this end, three variables were considered: rate of promotion to the next grade, repetition rate and dropout rate.
- A variable capturing student **learning**: the pass rate in the end of primary school exam (CEPE).

These two indicators were selected in consultation with the DMS technical team.⁶ They are consistent with Sustainable Development Goal 4.1 (SDG 4.1): "By 2030, ensure that all girls and boys **complete free, equitable and quality primary and secondary education** leading to **relevant and effective learning outcomes.**"

The two variables considered measure the dual objective of SDG 4.1: to enable pupils to complete the primary cycle and to acquire the required learning. While the achievement of these two objectives is, of course, complementary (since students who are struggling are more likely to repeat a year or drop out of school), other factors may also influence either of these dimensions to a greater or lesser extent. For example, factors concerning the school environment, such as the presence of latrines, are likely to encourage children's retention in school, while access to learning materials should facilitate learning. **Appendix 3** details how the performance variables were constructed.

a) Progression and retention indicators⁷

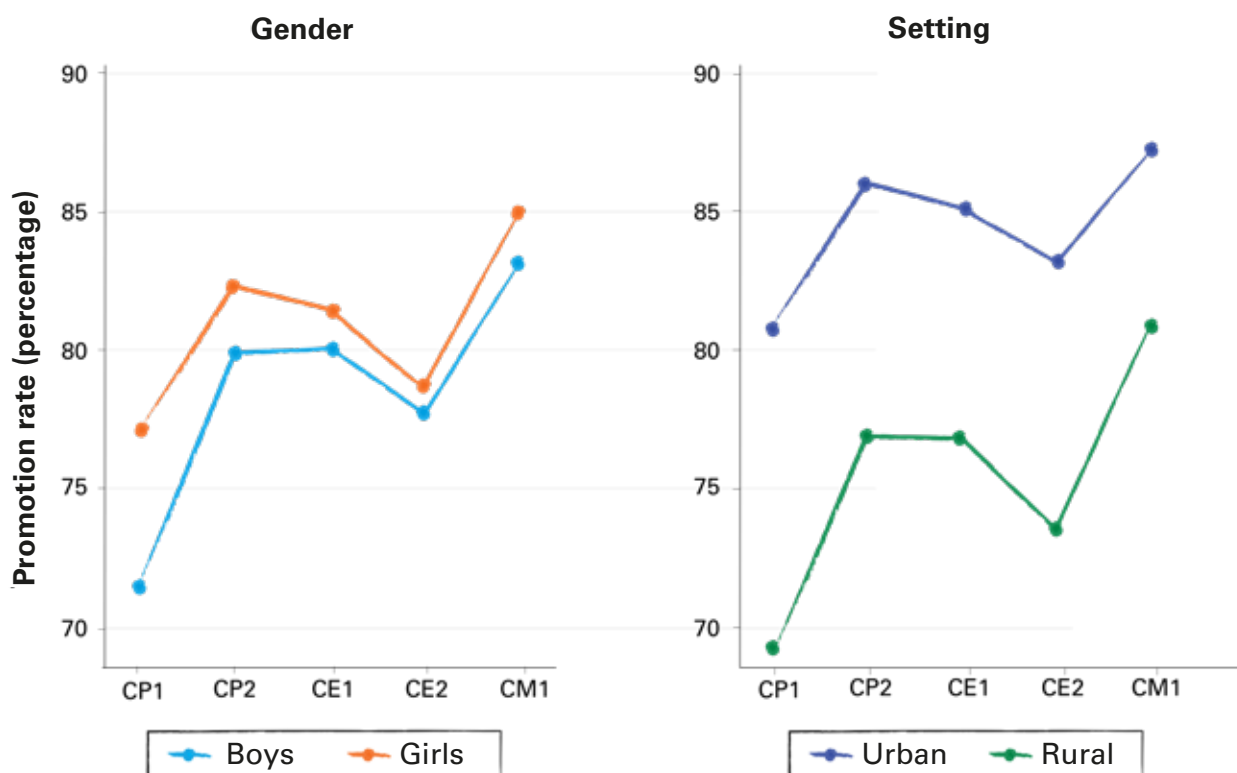
The student **promotion rate** was 79.9 per cent in 2021, with little disparity between public and private sectors. In contrast, it was much higher in urban areas (84.5 per cent) than in rural areas (75.4 per cent).

⁶ The technical team is made up of MENA staff specialized in the education data collected by the ministry and experts in Ivorian education policies. It is also supported by Ivorian education researchers.

⁷ The promotion, repetition and dropout rates published in this report may vary from other publications because they were calculated based on school data that could be tracked over time (see **Appendix 6**).

It was also higher for girls (81.2 per cent) than for boys (78.6 per cent) and tended to be lower in CP1 and CP2, where girls' advantage over boys is more pronounced (see **Figure 2**).

Figure 2: Promotion rates for girls and boys at the end of the 2020/21 school year



The average **repetition rate** for the last five years is 15.9 per cent, and it is much higher in the public sector (18.5 per cent) than in the private sector (5 per cent). It is also higher for boys (16.3 per cent) than for girls (15.5 per cent). The dropout rate is 12.9 per cent and is higher in rural areas (15.9 per cent) and among boys (13.9 per cent). However, the dropout rate should be interpreted with caution, because the way in which it is calculated means it is not possible to distinguish 'dropouts' from

inter-school transfers. It is therefore likely overestimated (see **Appendix 3**).

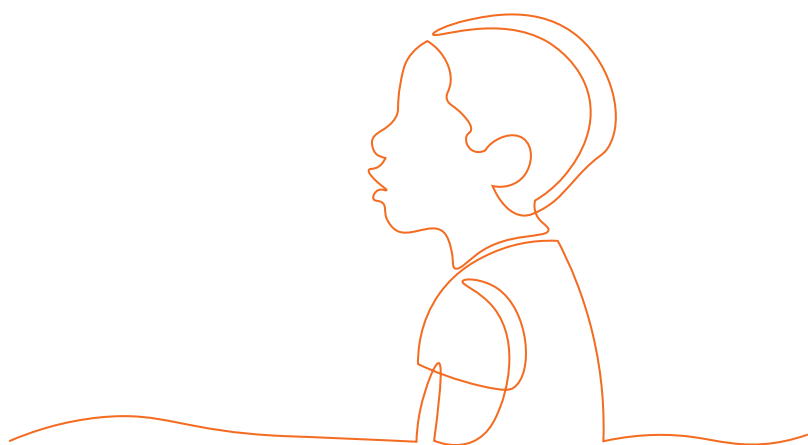
b) Learning indicator

Head teachers report the previous year's **CEPE pass rate** by gender when recording their school's data. The rates reported at the school level are extremely close to those reported at the national level, suggesting that this information is being captured correctly.⁸ The CEPE pass rates by school

⁸ The rates reported by head teachers do not include students who took the exam as external candidates.

group and gender were therefore included in the analysis. Data from 2020 were excluded because the exam was cancelled due to the COVID-19 pandemic; therefore, CEPE results for that year were based on students' scores in continuous assessments. For example, in 2020, the CEPE pass rate increased sharply from 2019 (95.3 per cent in 2020 compared with 84.5 per cent in 2019), only to fall drastically to 52.3 per cent in 2021. This trend is concerning because it means that many students will be unable to access secondary school and may finish their education in CM2, without passing the CEPE. These significant fluctuations in the CEPE pass rate also raise questions about its relevance as a learning indicator. In the absence of recent learning-assessment data, it is impossible to determine whether the drop in the CEPE pass rate is due to a sharp decline in learning outcomes resulting from school closures in 2020 or to changes in how the CEPE is organized that may have made it more difficult.⁹ This is why sudden changes in the CEPE pass rate should not necessarily be interpreted as a sudden deterioration in learning outcomes. However, we consider this indicator valid for measuring differences in learning across schools in the same year.¹⁰

This drop in the CEPE pass rate was particularly pronounced in public schools¹¹ and in rural areas, increasing inequalities. As a result, the gap between the highest-performing schools (private schools in urban areas) and the lowest-performing schools (public schools in rural areas) increased from 14 percentage points in 2019 to 40 percentage points in 2021. Widening inequalities can also be observed between public schools in rural areas and those in urban areas across Côte d'Ivoire's 14 districts. The decline was generally greater in rural schools than in urban schools, except in Abidjan, where rural public schools experienced a smaller decrease in the percentage of students passing the CEPE than urban public schools. More worryingly, regional inequalities were less pronounced before the school closures. In 2019, the lowest-performing region (Zanzan) was 25 percentage points behind Abidjan. Today, the lowest-performing region (Vallée du Bandama) is almost 40 percentage points behind Abidjan.

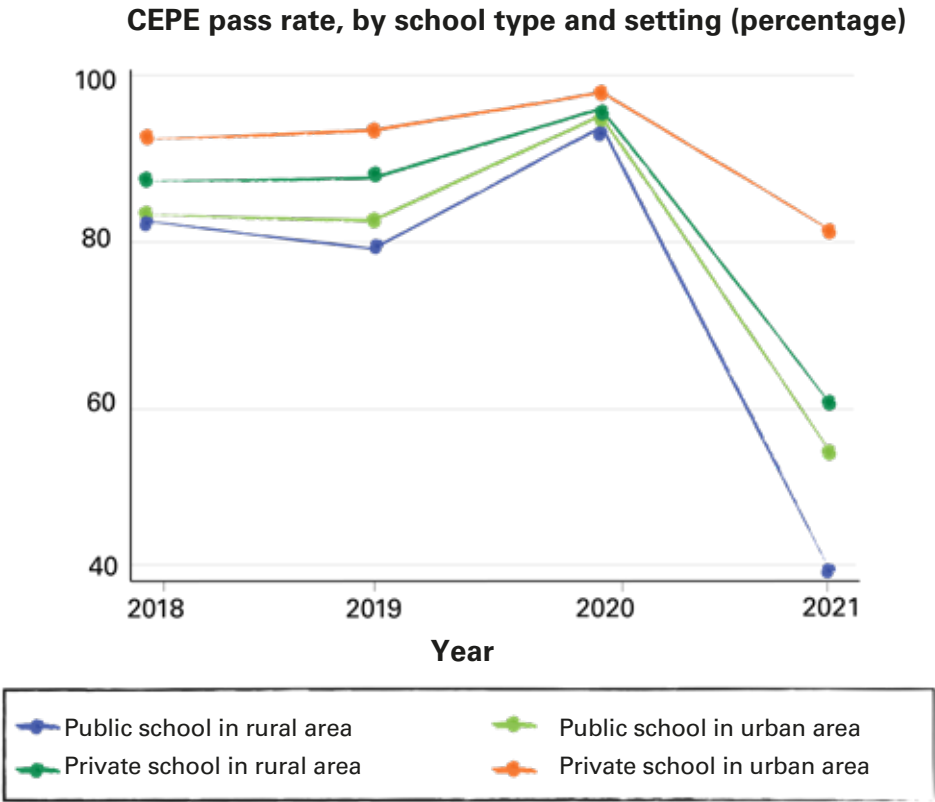


⁹ For example, a study in Ghana found that fluctuations in the West African Senior School Certificate Examination (WASSCE) pass rate are primarily due to fluctuations in exam difficulty (Rossiter et al., 2021).

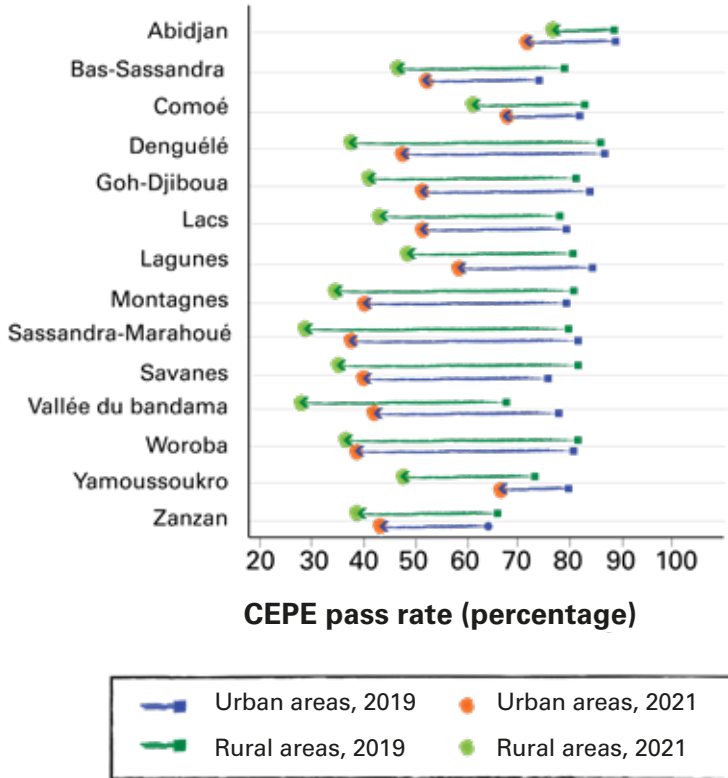
¹⁰ Explanatory models include fixed effects that capture systematic differences between years and thus control for changes in exam difficulty.

¹¹ Community schools (which account for 3.2 per cent of schools) are grouped with public schools throughout the report.

Figure 3: Trends in the CEPE pass rate, by school type and setting in 2019 and 2021



Public schools, by district



In 2019, 83.6 per cent of girls and 82.7 per cent of boys passed the CEPE. The overall pass rate dropped to 51.8 per cent in 2021.

B. Contextual variables and school inputs

In terms of the availability of school materials in public schools, we observe that the **distribution of kits has improved considerably since 2019**. In 2022, there was nearly one kit per student, with no significant differences between urban and rural areas. Efforts to increase the percentage of students receiving school kits are part of a long-standing MENA vision, the goal being to improve student learning (Wagner et al., 2022).

The data also allow us to measure the **availability of French and mathematics textbooks per student, which has also steadily improved since 2020**. Students attending urban public schools are on average 22 per cent more likely to have a mathematics textbook and 18 per cent more likely to have a French textbook than those attending rural public schools.

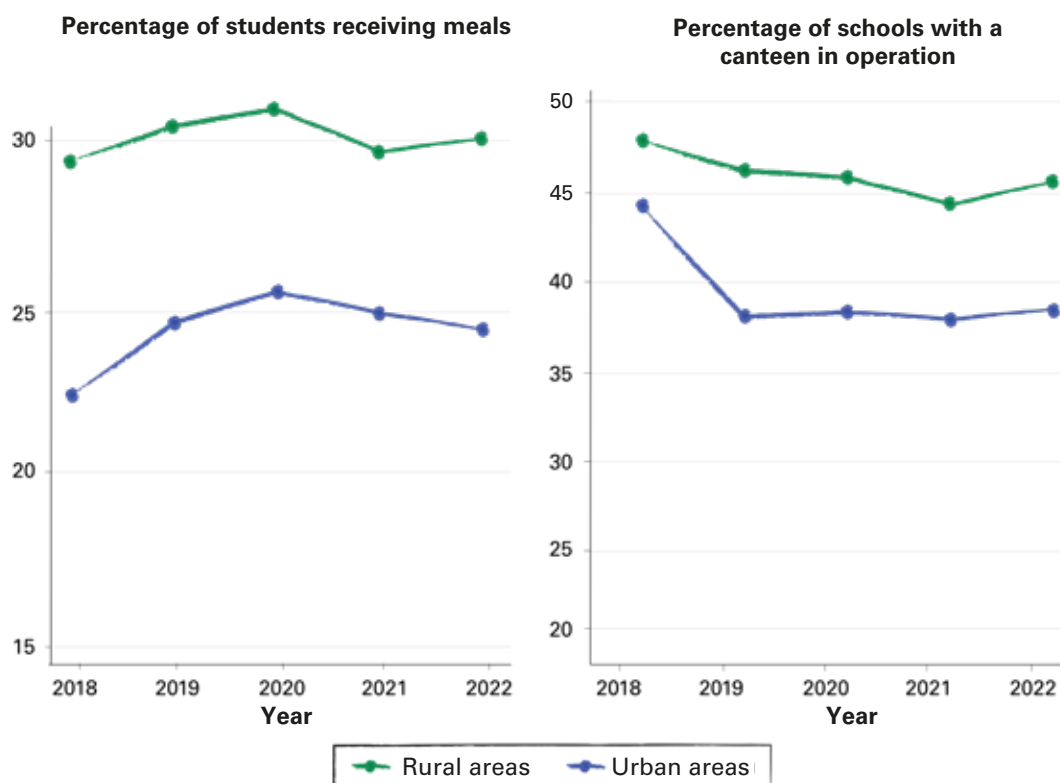
In terms of school infrastructure, the availability of latrines in public schools has improved, but progress has been faster in rural schools, where the lack of latrines is more common. **The number of rural public schools without latrines has steadily decreased, from 59.4 per cent in 2017/18 to 52.8 per cent in 2021/22, while it has decreased from 35.3 per cent to 31.2 per cent in urban public schools**. In contrast, because urban public schools are larger, they have the same number of latrines per 100 students as rural public schools (one latrine).

Similarly, **the number of seats per student is lower in urban schools** because they have more students (average class size is 48.7 in urban areas and 40 in rural areas). This number remained stable throughout the five-year period in both urban and rural schools.

It is also interesting to note that the **percentage of students without a birth certificate halved in rural areas after 2020 (40 per cent versus 20 per cent)**. However, it is impossible to determine whether this is the result of efforts to provide children with birth certificates or whether children without birth certificates have not enrolled in primary school since COVID-19-related school closures. According to the MICS (MICS, 2016), in Côte d'Ivoire, children from the wealthiest households, i.e., those in the top wealth quintile, are more likely to have a birth certificate (96.1 per cent of children under the age of 5 years) than children in the bottom wealth quintile (47.6 per cent). Children whose mothers have higher levels of education are also more likely to have their births registered. This variable is therefore definitely related to family wealth. Moreover, the MICS study reveals that the net enrolment rate is 84 per cent for 6–12-year-olds with a birth certificate, compared with just 50 per cent for children without a birth certificate.

The EMIS data also indicate whether a school has a canteen, whether it is in operation and the number of students who receive meals. **The number of canteens in operation has not increased since 2018**. Forty-five per cent of rural schools and less than 40 per cent of urban schools have a canteen (see **Figure 4**). Nevertheless, the school feeding programme provides free meals for only 18 school days per year. Primary school officials – including school lunch coordinators (Tresore, 2022) – must cover the remaining days, which can come at a cost to families. Since COVID-19-related school closures, the percentage of children paying for school meals has decreased slightly in both urban and rural schools (see **Figure 4**).

Figure 4: Trends in the number of students receiving meals and schools with a functional canteen (among public schools)



In public schools, regular teachers predominate. These are teachers recruited at the bachelor’s level or higher, or school assistants who have passed the regular teacher competitive exams. However, **the number of regular teachers has declined significantly since 2018**: they accounted for less than 50 per cent of teachers in rural public schools in 2022. Regular teachers have partially been replaced by trainees and school assistants, with the latter recruited at Lower Secondary Completion Certificate (BEPC) level and paid less than regular teachers. However, **a high proportion of teachers in public schools have a bachelor’s degree or higher**, especially in urban public schools (over 90 per cent).

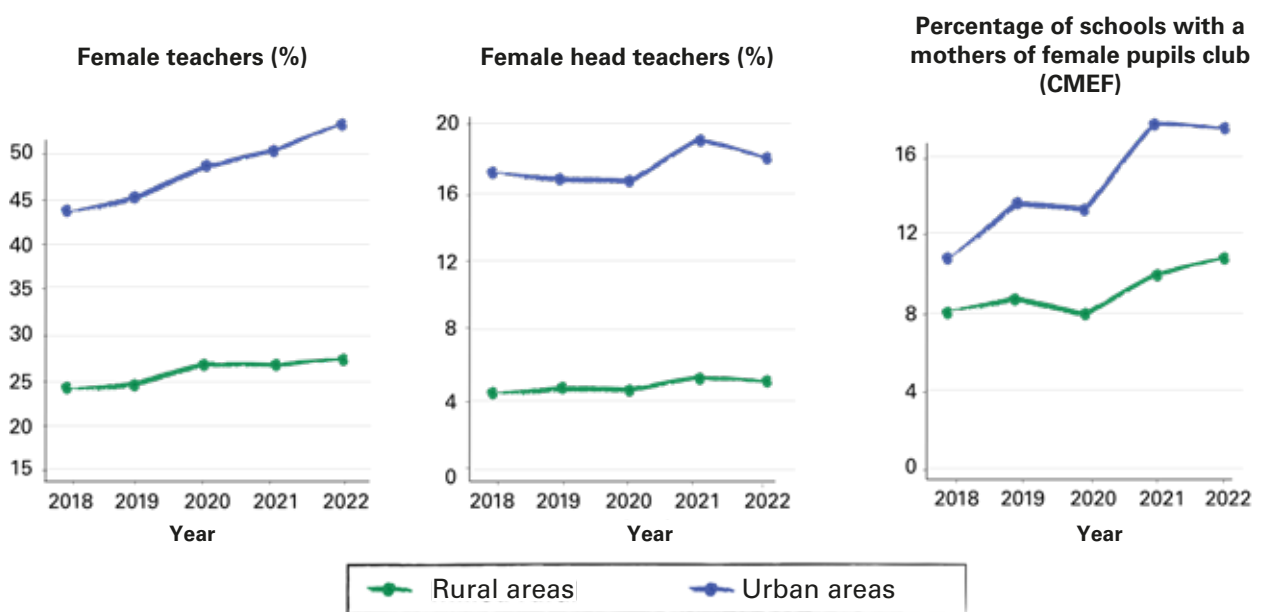
In Côte d’Ivoire, 38.8 per cent of teachers are women, while only 13.1 per cent of head teachers are women. The proportion of female head teachers is in line with the average for countries in the subregion.¹² The ratio of female teachers to female head teachers indicates that there is a ‘glass ceiling’ affecting their careers in Côte d’Ivoire, as they are four times less likely to be promoted than their male counterparts. **In addition, female teachers and female head teachers are unevenly allocated across the country.** Urban public schools attract twice as many female teachers as rural public schools (53 per cent versus 27 per cent, see **Figure 5**). **The number of female teachers has steadily increased in urban public schools, exceeding 50 per cent in 2022, but has stagnated in rural public schools.** In this context, female head teachers are almost four times more present in urban public schools than in rural schools.

¹² Eleven per cent in Togo, 9 per cent in Mali, 12 per cent in Burkina Faso and 17 per cent in Niger according to Bergmann *et al.* (2022).

Finally, and again with regard to gender issues in the school sector, **the number of schools with a CMEF has increased over the past five years** – more so in urban than in rural public schools. In 2022, 11.3 per cent of schools in Côte d'Ivoire had a CMEF. These clubs are the result of a MENA initiative to keep girls in school by actively involving their mothers in the school's

sociocultural activities, cleaning the school and sometimes fundraising. Sociocultural activities can include discussion forums that bring together mothers and daughters. These clubs work to address issues, including early marriage, adolescent pregnancy and early school dropout, in order to keep girls in school.

Figure 5: Trends in the number of CMEFs, female teachers and female head teachers (in public schools)



2. Methodology for modelling performance factors

Multivariate econometric models were estimated in order to estimate the factors associated with student performance.¹³ Their goal was to accurately estimate the relationship between variables of interest (such as class size or number of textbooks per student) and performance variables (such as promotion rates or examination grades), in order to inform education policies in Côte d'Ivoire.

Ideally, we would be able to interpret the estimated coefficients as causal effects rather than simple correlations, but this is very difficult to achieve in observational data analysis. In terms of policy recommendations, this means that while our analysis shows, for example, that student performance is better when textbooks are available, this does not prove that distributing more textbooks will be sufficient to improve student outcomes. There may be other reasons for this positive relationship; schools with more textbooks may also have better school infrastructure, such as blackboards or qualified teachers.

¹³ Explanatory variables were selected based on their relevance to the research questions, variability, data quality, low non-response rate and association with the performance variables. Variables with little variability are not included in the model, since they contribute little to the results and may introduce multi-colinearities.

To minimize the risk that the observed correlations are due to these other elements, we made the most of the data’s richness by introducing numerous control variables. The models therefore incorporate student demographic characteristics, classroom characteristics (e.g. class size, multigrade classes), teacher characteristics (e.g. qualifications, gender), availability of school inputs (e.g. textbooks) and characteristics at the school and head-teacher level (e.g. presence of latrines, head teachers’ qualifications and experience).

In addition, we incorporated school-level fixed effects models, which control for any unobserved factors in the database that do not vary, or that vary little, over time (e.g. the school’s socioeconomic background). For each school, we have data spanning several years and several grades, disaggregated by gender, allowing us to introduce a school fixed effect.¹⁴ Because the school fixed effect controls for all parameters that are stable over time at the school level, the estimated relationships are derived from the variance of the parameters within schools (either over time, between different levels, or between girls and boys). For example, the availability of textbooks within a school varies between levels and over time. The model will therefore estimate, for each school, whether the grades and years with better textbook availability also perform better. Each school therefore carries out its

own controls, which ensure that the observed relationships between the variables of interest and the performance variables are not due to systematic differences between schools. In this way, the models incorporate fixed effects for school, year, academic level and the interaction between academic level and year to identify shocks that occur over time, such as school closures due to the COVID-19 pandemic.

Finally, we tested the robustness of the findings by defining models without school fixed effects but with control variables, and models without any control variables (see **Appendix 3**). This approach aims to evaluate how coefficients change when the models incorporate more control variables.

These three strategies – data richness, school fixed effects and robustness testing – help minimize the chances that the estimated coefficients are simple correlations, even if we cannot say with certainty that the estimated effects are causal. However, quantifying the relationship between school inputs and school performance is extremely important for public policymaking, as it allows us to assess which actions are most likely to improve the education system.

The findings of the different models are presented in the following tables.

a.	Promotion rate: main indicator of student progression	Table 5
b.	CEPE pass rate: main indicator of student learning outcomes	Table 6
c.	Repetition rate	Table 7
d.	Dropout rate	Table 8

¹⁴ In more technical terms, we have panel data, which have been used in the analysis.





4. Findings

Findings of the econometric modelling



1. Student gender

In Côte d'Ivoire, **girls do better than boys in terms of promotion rates and CEPE pass rates**. National statistics show that the promotion rate for girls is 2.5 percentage points higher than for boys. Their CEPE pass rate is also 0.8 percentage points higher (see **Table 2**). Boys are also more likely to drop out of primary school than girls, demonstrated by the higher ratio of boys to girls in the lower grades (1.1 in CP1 in 2022 among new starters) compared with the final grade (1.02 in CM2 in 2022 among new starters).

The relationships between variables of interest and student performance may vary according to student gender. To capture this, we isolated the effects for boys and girls for selected school inputs for which gender is important.¹⁶ Our model suggests that **the distance from home to school is a challenge for girls but not for boys**. This finding is consistent with other studies showing that the journey to school may be more dangerous for girls.¹⁷ Interestingly, this effect is found only in the urban subsample, where it may be more dangerous for girls to travel.

Girls tend to perform better in the CEPE when they are taught by female teachers, while this association is not statistically significant among boys.

Table 2: Promotion, repetition, dropout and CEPE pass rates for girls and boys, 2020/21

	Boys	Girls	Total
Promotion rate (%)	78.45	80.98	79.68
Repetition rate (%)	16.30	15.52	15.92
Dropout rate¹⁵ (%)	14.08	11.98	13.06
CEPE pass rate (%)	51.11	51.96	51.53

¹⁵ The sum of the promotion, dropout and repetition rates may exceed 100 per cent because the data do not contain information on inter-school transfers, meaning it is likely that the dropout rate calculated is an overestimate.

¹⁶ We interacted the variables of interest with student gender, i.e., the gender variable was multiplied by the variables of interest for which we wanted to obtain the differential effect for girls and boys.

¹⁷ For example, see the positive effect of bicycle distribution on girls' schooling in Zambia: <https://poverty-action.org/wheels-change-impact-bicycle-access-girls-education-and-empowerment-outcomes-rural-zambia>.

In addition, the percentage of male teachers in the school is positively correlated with the promotion rate for boys but not for girls.¹⁸ Caution must be exercised in analysing these findings, which may be due to confounding effects; however, they do suggest that if the number of students with a female teacher were to increase from the current 38.8 per cent to 50 per cent, the CEPE pass rate for girls could increase by 0.48 percentage points and their promotion rate would remain stable.

In contrast, the promotion rate for boys could drop by 0.35 percentage points. The measured effects are relatively small, but they indicate potential gender dynamics in student-teacher relationships. Further research is needed to better understand these dynamics.

The presence of a CMEF is correlated with girls' retention in school, but is not correlated with boys' performance. Girls attending schools with a CMEF are 1.2 percentage points more likely to move up to the next grade. In contrast, no significant effects were detected in the models focusing on CEPE scores. These observations are logical, as CMEFs aim to promote girls' enrolment in school. Currently, these clubs are present in only 12.7 per cent of school groups, and 1.7 million girls attend primary schools that do not yet have a CMEF. The findings suggest that the dropout rate is 0.5 percentage points lower in schools with a CMEF. As such, establishing clubs in the remaining 87.3 per cent of school groups could potentially keep approximately 9,000 girls in school each year.

Finally, it should be noted that **the presence of a female head teacher is associated with a better promotion rate, especially in the public sector.** This translates into slightly lower dropout rates in female-led schools (-0.5 per cent). These effects are relatively small and are not found in models for CEPE scores, but they are consistent with recent research reporting better management skills among female head teachers in countries

where women face discrimination in hiring or career advancement, as they must be better than men to reach the same level (Martinez et al., 2021). They are also in line with other studies showing that women are underrepresented among head teachers, despite seemingly higher student outcomes in female-led schools (Bergmann et al., 2022).



2. Other student characteristics

Children's ages are included in the statistical models to control for potential age-related biases at the classroom level. **We observe that older children have a lower probability of being promoted to the next grade** than younger students in the same grade, and are more likely to drop out.

Another student characteristic incorporated into the model is the percentage of students within a class who do not have a birth certificate. The findings of the models suggest that **the higher the proportion of children without a birth certificate in a class, the higher the average promotion rate, and the lower the dropout rate.** The lack of detailed information on children without a birth certificate makes it difficult to understand this positive association between the promotion rate and a lack of birth certificate. It may be that families who send their children to school without a birth certificate are particularly motivated to educate them. This motivation therefore outweighs the potential problems caused by their lack of birth certificate. The absence of a birth certificate may therefore be a barrier to accessing schooling, but not necessarily a barrier to children's progress once they are in school.

¹⁸ We calculated the effect of the proportion of female teachers on girls by adding the main coefficient, the coefficient for girls' interaction, and the percentage of female teachers.

On the other hand, **the percentage of students without a birth certificate is negatively correlated with the CEPE pass rate**. This is not surprising, as children without a birth certificate cannot access secondary school and therefore may have less incentive to pass the CEPE.



3. Teacher characteristics

The models include teacher characteristics, measured in particular by the percentage of regular, assistant and trainee teachers in the school. Teachers' status is linked to their teaching diploma. The findings should be interpreted in terms of the difference with contract teachers, i.e., the reference category. **Strikingly, the percentage of regular teachers is associated with lower promotion rates, while the coefficient is positive for trainee teachers**. This could be due to their different motivations: for example, trainee teachers have to prove themselves and their work is evaluated by their trainers. It is also possible that trainee teachers' inexperience means they are less strict about the requirements for progressing to the next grade. The results show that in public schools, **the presence of regular teachers is correlated with a better CEPE pass rate than contract teachers**. This finding is consistent with the **Time To Teach** report's analysis of teacher absenteeism (Alban Conto, 2021) and provides a good entry point for sector-level discussions on teacher issues and job choice.

Teachers' academic level (measured by the percentage of teachers with a bachelor's degree or higher) is associated with better promotion rates, lower dropout rates and better CEPE scores. It should be noted that the observed relationships are stronger in rural schools than in urban schools, but that this correlation is not significant in private schools.



4. Teaching-group size, multigrade classes and double-shift systems

Larger teaching groups¹⁹ are associated with lower promotion rates, but the effect is not linear. A decrease in the size of the teaching group from 60 to 50 students is associated with a 3.9 percentage point increase in the promotion rate, a 3 percentage point decrease in the dropout rate and a 2.5 percentage point increase in the CEPE pass rate. These effects are even more significant for progression when they occur in smaller classes.

Thus, going from 35 to 25 students is associated with a 5.1 percentage point increase in the promotion rate and a 3.8 percentage point decrease in the dropout rate.

However, in this case, the increase in the CEPE pass rate is just 2 percentage points. While the effect of reducing the size of teaching groups is more pronounced in small classes, it is greater at the aggregate level in large groups, where it will benefit more students.

¹⁹ The data show the number of students per teaching group in the school. A teaching group includes students of the same grade who are in the same class. Teaching group size may differ from class size when students attend a multigrade class, as there are two teaching groups in the same class. Therefore, we halved the teaching-group size when a double-shift system was in place, based on the assumption that head teachers report only one teaching group, which is divided into two teaching shifts. This assumption affects the estimated coefficient for the double-shift system.

In Côte d'Ivoire, teachers are not evenly distributed among schools, and pupil-teacher ratios (PTRs) vary greatly from one school to another. The degree of randomness in teacher allocation was 46.8 per cent in 2022, which places Côte d'Ivoire in the upper average of African countries. This is also regression compared with 2013, when the UNESCO International Institute for Educational Planning (IIEP) (Dakar Office) noted a 43 per cent degree of randomness (IIEP Dakar Office, 2016). **Thus, 25 per cent of students attend schools with PTRs greater than 55 students per teacher, while 25 per cent attend schools with 37 or fewer students per teacher.** A more equal distribution of teachers could help improve learning by reducing class sizes.²⁰ We simulated a teacher reallocation policy in which no public school would have a PTR greater than 50, while keeping the number of teachers constant. This would involve reassigning approximately 5,000 teachers from schools with a PTR below 32 to those with a PTR above 50. This would decrease the PTR at the student level from 46 to 44.8 for 2022 and, **based on the findings of the model, could result in a 0.9 percentage point increase in the promotion rate.** For the CEPE, reducing the variability in CM2 class sizes, so that none of the classes exceed 50 students or fall below 20 students, could increase the CEPE pass rate by 1.3 percentage points.²¹

The models also reveal a correlation **between how teaching groups are organized and academic performance.** Students who attend a multigrade class have a 2.8 percentage point lower promotion rate and a 4.7 percentage point lower CEPE pass

rate. However, it is important to note that multigrade classes generally have at least two teaching groups and therefore a larger class size than single teaching groups (47.9 students on average for single groups and 26.2 students for multigrade groups). The 2.8 percentage point drop in the estimated promotion rate in multigrade classes therefore seems relatively small compared with the 10.3 percentage point drop in the estimated promotion rate when the size of the teaching group increases from 26.2 to 47.9 students. With regard to CEPE success, the decrease observed in multigrade classes is greater than the decrease observed when the size of teaching group changes from single to multigrade (-4.7 percentage points versus 2.1 percentage points for 23 additional pupils in a CM2 class). In summary, organizing classes into multigrade classes appears to have a greater influence than class size on CEPE success, while class size appears to have a greater effect on promotion rates.

It is mainly double-shift systems that seem to cause problems: promotion rates are 18.5 percentage points lower in double-shift classes. However, the findings for double-shift systems should be interpreted with caution. Unlike multigrade classes, the models for CEPE scores do not show that double shifts have a negative effect. In addition, disaggregating the data on repetition and dropout shows that the main effect of double-shift systems is an increase in dropout rates. This may be the case, but it may also reflect parents' propensity to change schools when double-shift systems are introduced – which could artificially increase the dropout rate due to the lack of data on inter-school transfers.

²⁰ Although the PTR in public schools is 41.5 nationally, the PTR calculated at the student level is 46 because there are more students in schools with high PTRs.

²¹ The simulations performed do not take into account classroom availability, which could be a factor limiting the optimum distribution of teachers.



5. School materials

The mathematics and French textbooks and school kits distributed to each student are positively correlated with the promotion rate and the CEPE pass rate.²² The coefficients should be interpreted as the effect of an additional book (up to two books, one for each subject) and the effect of a complete school kit. Since there is currently an average of 0.7 books per student in the public sector, if every student in public schools nationwide had two books, the promotion rate would increase by 0.5 percentage points and nearly 5,000 additional students would pass the CEPE.



6. School characteristics

The presence of a school library is associated with higher promotion rates, but not with improved learning levels. Libraries are most relevant in schools located in rural areas and also help reduce repetition rates in these schools.

While the percentage of students receiving meals is positively correlated with the promotion rate, the presence of a school canteen is negatively correlated with this rate. This could be because programme intensity is relatively low; students receive only 18 days of hot meals during the entire school year (World Food Programme country office in Côte d'Ivoire, January 2019). At the national level, the negative effects of canteens could be reversed if 55 per cent more students began receiving meals.²³ **The CEPE pass rate is positively correlated with the presence of a school canteen.**

Latrine availability is correlated with school retention (higher promotion rates and lower dropout rates), but is negatively associated with CEPE pass rates. One additional latrine per 100 students is associated with a 0.4 percentage point higher promotion rate. Currently, almost half of public schools do not have latrines (46 per cent). Equipping all public schools in Côte d'Ivoire with at least one latrine would require approximately 7,300 latrines to be constructed. This would increase the number of latrines per 100 students from 1 to 1.2 in the public sector, with a greater increase in rural areas (from 1 to 1.3). According to the findings of our models, this could lead to a 0.06 percentage point improvement in the promotion rate, with most of the positive effect concentrated in rural areas (0.12 percentage points), where dropouts could decrease (-0.13 percentage points). The correlation between the presence of latrines and school performance seems to be fairly weak, but latrines in schools are nonetheless very important in terms of providing students with good hygiene and privacy.

The presence of a school management committee (COGES in French) is negatively associated with children's academic performance, both in terms of learning and retention. The school management committee is a participatory body where teachers, parents, communities and other partners and stakeholders involved in the life of the school are represented. It allows local authorities to monitor the life of the school and is responsible for the school's budget. It is unclear why there is a negative correlation between the presence of a school management committee and school performance; more field research is needed to better understand the dynamics of parent-school relationships. Stage 3 of the Data Must Speak research plans to answer some of these questions.

²² The ratio is calculated by dividing the number of textbooks for a given grade by the number of students in that grade. Ratios above 1 in a school are capped at 1. The ratio therefore indicates the number of textbooks that students can actually use.

²³ 'Students receiving meals' are students who eat in the canteen.

²⁴ The presence of latrines could be negatively correlated with CEPE scores if they enable lower-achieving students to stay in school until CM2.

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5. Education policy simulations and insights



Education policy simulations and insights

To aid understanding of these findings, we simulated different education policies for the public system, based on parameter changes from the 2021/22 data levels. We estimated the effect of these education policies on promotion rates, CEPE success, gender inequalities and urban-rural disparities. Where possible, we have also indicated efforts to be made regarding inputs. Finally, we evaluated the reliability of the findings (see **Appendix 4**).

The findings of this exercise are available in **Table 3**. The findings suggest that education policies aimed at increasing teacher numbers could have a significant effect in terms of reducing class sizes. This would, however, come at substantial cost to the system. In addition, the system could be made more efficient by distributing teachers more equitably among schools. However, transferring teachers from rural to urban areas should be avoided as this would exacerbate inequalities between these areas. Distributing teachers more evenly also assumes that sufficient classrooms are available – a factor that the analysis did not consider. Teachers' personal situations must also be taken into account so that any redistribution does not result in them losing motivation.

Students appear to benefit from a decrease in the use of double-shift systems, although precise estimates of this outcome are difficult to make. In all scenarios, ensuring that all students receive the same number of teaching hours seems to help promote equity. The findings also reveal potential insights for education policy to explore regarding the composition of teaching staff. The effect of teaching status, and therefore of training, is unclear and has not been included in the education policy simulations.

However, the relatively good effect of trainee and contract teachers on promotion rates raises questions about how well regular teachers or school assistants apply their experience and academic knowledge to benefit students. Recruiting teachers at the bachelor's level seems to have a positive effect and should continue, as models show it is effective in helping students.

Recruiting more female teachers may improve girls' performance, but boys' performance may suffer. Understanding why teacher gender plays a role in student performance seems to be an important factor. It certainly reveals unresolved gender dynamics within schools that may influence student performance. Promoting more female teachers to the position of head teacher could improve system performance at zero cost. However, this would require a review of current promotion processes and verification that current female teacher profiles are compatible with increasing the number promoted to head teacher. Better understanding is also required of the barriers preventing female teachers from accessing head teacher positions in Côte d'Ivoire.²⁵

²⁵ This report contains a more detailed discussion of potential barriers preventing women from accessing leadership positions: <https://www.unicef-irc.org/publications/1399-increasing-womens-representation-in-school-leadership-a-promising-path-towards-improving-learning.html>.

MENA's long-term vision and its efforts to improve learning by making more school kits available appear to be working, and should be extended to schools that have not yet benefited. The presence of textbooks also plays a significant role, especially for learning. Having one textbook for each student could significantly improve results.

Making CMEFs available in all schools could be an interesting avenue for education policy to explore. Although the gains at the national level would be quite small, it would help prevent about 9,000 girls from dropping out of school each year, at a relatively low cost.

Lastly, education policies aimed at improving school infrastructure produce mixed results.

Increasing the number of canteens and the number of students receiving meals should be accompanied by a policy that ensures a sufficient number of canteen days, as well as further research to understand why the presence of a canteen may have negative effects in some cases. Further research is also needed to better understand the effects associated with additional latrines, as models suggest a fairly weak correlation with student retention and a negative correlation with learning. Building additional libraries does not seem to be a priority given their cost and little effect on academic performance. Finally, investing in new school infrastructure to improve the number of available seats could be beneficial, as this solution seems to have a fairly significant effect on school retention.



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Table 3: Education policy simulations

Education policy	Promotion rate		CEPE pass rate		Cost/effort	Reliability of findings (maximum score: 12)
	Effects (in percentage points)	Inequalities	Effects (in percentage points)	Inequalities		
Reduce class sizes in public schools by five students.	2.5	The increase would be greater in rural areas than in urban areas (2.6 percentage points versus 2.2 percentage points).	0.5	The increase would be greater in urban areas than in rural areas (0.5 percentage points versus 0.4 percentage points).	Recruiting approximately 10,600 teachers and building more classrooms.	10.5
Recruit so that 50 per cent of head teachers are female.	0.3	Higher rate in urban areas.	Not significant.	Not significant.	Promoting more female teachers to the position of head teacher.	10.5
Recruit so that 50 per cent of teachers are female.	-0.3	Boys' results would fall, while girls' results would improve, widening the gender gap.	0.3	Girls' scores would increase faster than boys' scores (+0.5 percentage points for girls). This would increase the gap between girls and boys.	Implementing a targeted recruitment goal for female teachers, while ensuring that the required skill level is maintained.	10

Education policy	Promotion rate		CEPE pass rate		Cost/effort	Reliability of findings (maximum score: 12)
	Effects (in percentage points)	Inequalities	Effects (in percentage points)	Inequalities		
Ensure that PTRs are under 50 in public schools.	0.9	This would increase urban-rural inequalities, as the effect would be larger in urban areas (1.6 percentage points versus 0.4 percentage points).	1.3	Reduces inequality, as higher in rural areas.	Reallocating approximately 5,000 teachers from the schools with the lowest PTRs (<32 for promotion and 20 for CEPE) to schools with the highest PTRs (>50).	10
Make CMEFs available in all schools.	0.4	The entire effect is concentrated on girls and is mainly in rural areas (for girls, +0.8 percentage points in rural areas versus +0.3 percentage points in urban areas).	Not significant.	Not significant.	Making CMEFs available in the 10,500 schools that do not currently have one.	10
Ensure 100 per cent of teachers have a bachelor's degree or higher.	0.3	Higher rate in urban areas.	0.9	Concentrated in rural areas.	Increasing the percentage of students instructed by a teacher with at least a bachelor's degree from 80 per cent to 100 per cent.	9
Provide one French book, one mathematics book and one school kit per student.	0.4	Stronger effect in urban areas (0.7 percentage points versus 0.3 percentage points).	0.9	Not significant.	Approximately 3.6 million French or mathematics textbooks and 80,000 school kits are needed and would have to be purchased or reallocated among schools.	8.5
Build one library per school.	0.4	Higher in rural areas.	Not significant.	Not significant.	Building libraries in 10,600 schools.	8.5

Education policy	Promotion rate		CEPE pass rate		Cost/effort	Reliability of findings (maximum score: 12)
	Effects (in percentage points)	Inequalities	Effects (in percentage points)	Inequalities		
Provide one seat per student.	2.1	Higher rate in urban areas.	Not significant.	Not significant.	There are currently only 0.8 seats per student.	7.5
Equip all schools with at least one latrine.	0.06	Concentrated effect in rural areas.	-0.14	Not significant.	Building approximately 7,300 latrines.	7
Build one canteen per school and reach 50 per cent of students receiving meals.	-0.2	More negative in rural areas.	1.8	Higher rate in urban areas.	Building 7,500 canteens and increasing the number of students receiving meals from 28 per cent to 50 per cent.	6
Eliminate double-shift systems in public schools.	1.2	Same effect in rural and urban areas.	Not significant.	Not significant.	Building approximately 1,600 classrooms or redistributing students among schools.	5



6. Conclusion

Conclusion

The first stage of the DMS research in Côte d'Ivoire analysed performance factors in the Ivorian education system using administrative data collected by the Department of Studies, Planning and Statistics. Econometric modelling has revealed many education policy insights that could improve school performance. Quantifying the relationships between school inputs and performance variables, for example, helps guide MENA budget allocations. In particular, the report revealed the gender-related interactions between students and teachers and the positive effect of having female head teachers. The findings on gender issues are also noteworthy, such as the positive role of CMEFs in keeping girls in school and the negative effect of distance to school observed for girls. The report also precisely quantifies the links between educational performance and teacher numbers and qualifications. Among other things, this has made it possible to simulate the potential effects of reducing class size by recruiting additional or more-qualified teachers. Finally, it should be noted that the report highlighted the role of educational inputs, such as textbooks and school kits, which should be distributed to the few schools that do not yet have them.

However, there are limitations to this first stage of the research. Although we can quantify the relationships between inputs and academic performance, we cannot explain the reasons behind them in detail. Although rich, the data available do not take into account some important factors explaining school performance, such as teaching practices. Moreover, in some cases, as noted in our analysis of the findings' reliability, we cannot state with certainty that the observed relationships are not due to confounding factors.

The next stages of the DMS research in Côte d'Ivoire will aim to fill some of the gaps in this analysis. By collecting quantitative and qualitative data in control and positive deviant schools (i.e., those that perform significantly better than our models predict), we should be able to understand the behaviours and practices behind student outcomes that our models are unable to capture. Analysing these primary data will help us understand the reasons behind some of the relationships observed between school inputs and school performance and should allow us to refine education policy recommendations.





7. Appendices



Appendix 1: Descriptive statistics

Table 4: Descriptive statistics – 2021

Variables	National	Rural	Urban	Public schools	Private schools	Community schools	Boys	Girls
Promotion rate (%)	79.9	75.4	84.5	80	80.6	64.1	78.6	81.2
Repetition rate (%)	15.9	18.4	13.3	18.5	5	3.9	16.3	15.5
Dropout rate (%)	12.9	15.9	9.8	11.6	17.1	34.2	13.9	11.8
CEPE pass rate (%)	51.9	41.7	62	46.4	78.6	64.4	51.8	51.9
Girls (%)	48.6	47.2	50	48.4	49.7	45.4	0	100
Average distance to school (km)	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2
Average age	8.4	8.5	8.3	8.5	8	8.3	8.4	8.4
Students without a birth certificate (%)	21.9	32	11.4	24.1	11.1	32.2	22.7	21.1
Female teachers (%)	35.8	25.5	46.6	36	36.1	17.8	35.2	36.4
Regular teachers (%)	48.9	47.3	50.5	58.7	8.8	0.6	48.6	49.1
School assistants (%)	27.9	31.3	24.4	30.8	17.5	0.5	28	27.9
Trainee teachers (%)	1.1	0.3	1.9	0.2	5	0.1	1	1.1
Teachers with a bachelor's degree or higher (%)	74.8	73.2	76.4	83.1	41.1	29.2	74.6	75
Class size	44.3	40	48.7	44	46.9	25.3	44.1	44.4
Multigrade classes (%)	11.4	19.2	3.2	10.7	9.8	63.5	11.8	10.9
Double-shift systems (%)	5.2	1.5	9.2	6.3	0.8	0.4	5.1	5.4
School kits distributed	0.7	0.8	0.6	0.9	0	0.1	0.7	0.7
Textbooks (per student)	0.9	0.7	1.2	0.9	1.3	0.3	0.9	1
Female head teachers (%)	12.3	5.3	19.6	10.9	18.7	9.6	11.9	12.7
Latrines (per 100 students)	1.1	1	1.2	1	1.5	0.2	1.1	1.1
Canteens in operation (%)	36.9	41.5	32	41.9	17.4	0.1	36.8	36.9
Students receiving meals (%)	23.3	27.6	18.7	27.7	5.4	0.1	22.7	23.9
Classrooms in good condition (%)	78.4	69.6	87.7	76.2	93.1	25.1	77.9	78.9
Presence of a CMEF (%)	11.3	9.4	13.4	13.2	3.8	0.5	11.1	11.5
Number of seats (per student)	0.8	0.8	0.8	0.8	0.9	0.7	0.8	0.8
Presence of a library (%)	12.4	10.6	14.4	11.5	17.5	0.6	12.2	12.7
Share of population at the student level (%)	100	63.9	30.9	70.4	19.6	4.8	50	50
Share of population at the school level (%)	100	51.2	48.8	80.5	17.9	1.5	51.4	48.6

Figure 6: School input trends (in public schools)

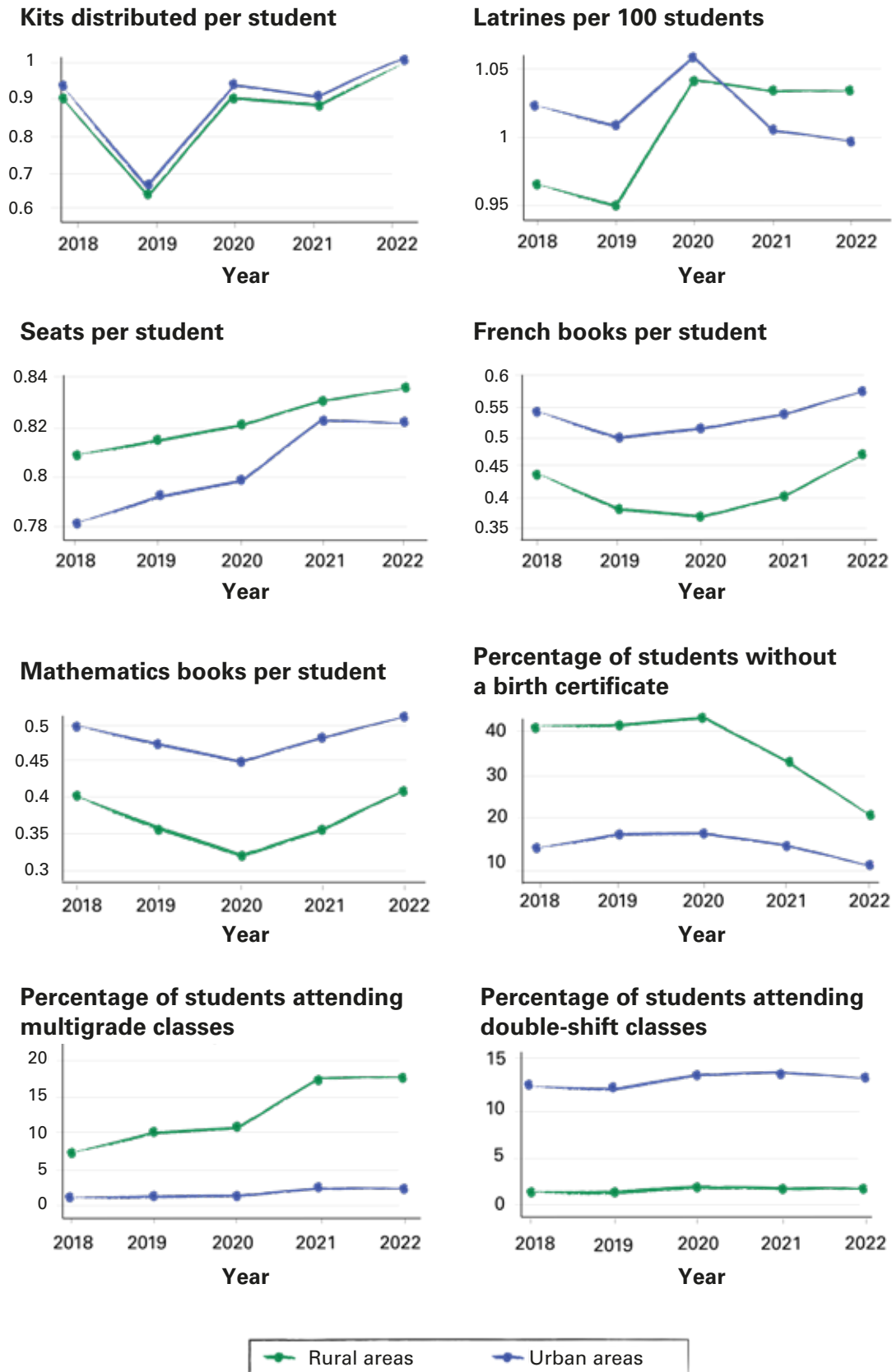
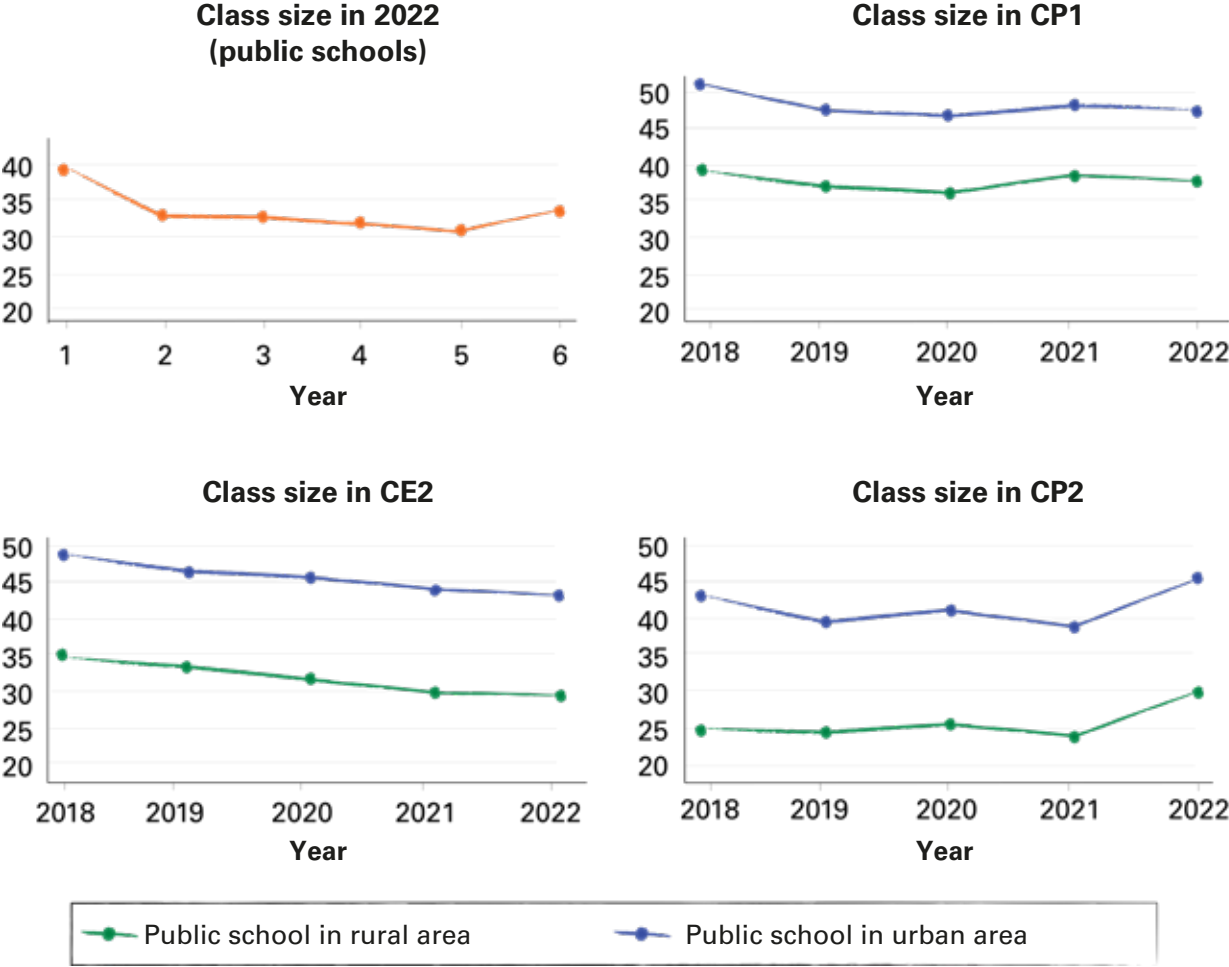


Figure 7: Class size trends (in public schools)

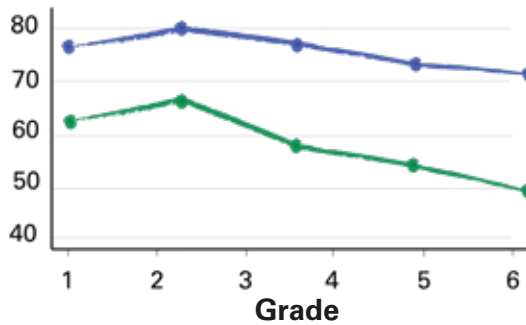


*Multigrade classes correspond to two classrooms

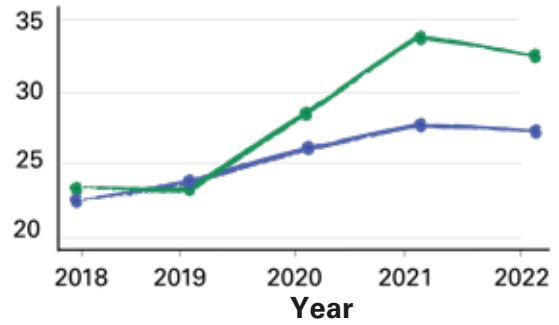


Figure 8: Trends in teacher characteristics (in public schools)

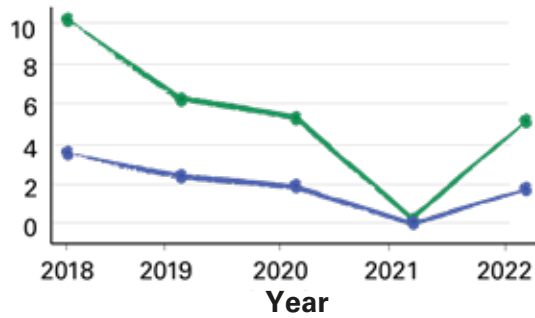
Regular teachers (%)



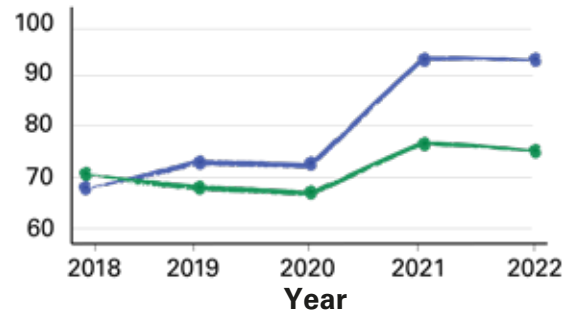
School assistants (%)



Trainee teachers (%)



Percentage of teachers with a bachelor's degree or higher





Appendix 2: Results tables

Table 5: Models based on promotion rates

	(1)	(2)	(3)	(4)	(5)
	National	Public schools	Private schools	Rural public schools	Urban public schools
Girls	1.081**	0.638	1.160	-0.134	3.084***
Average distance to school	0.167	0.337*	-0.280	0.462*	-0.296
Girls × average distance to school	-0.480**	-0.249	-0.701*	-0.0221	-0.385
Average age	-1.311***	-1.277***	-1.284***	-1.057***	-1.751***
Students without a birth certificate	1.276***	1.143***	1.341**	1.133***	0.575
Female teachers in the school (%)	-0.0324***	-0.0423***	0.0151	-0.0373***	-0.0444***
Girls × % of female teachers in the school	0.0392***	0.0439***	0.0209**	0.0373***	0.0124*
Regular teachers	-0.945***	-0.755	0.384	-0.646	-0.410
School assistants	-0.533*	0.399	-0.849*	0.165	2.656*
Trainee teachers	1.258***	2.458***	0.733	2.159***	2.722
Teachers with a bachelor's degree or higher	1.220***	1.683***	0.141	1.214***	1.729***
Size of the teaching group	-0.656***	-0.777***	-0.393***	-0.812***	-0.641***
Size of the teaching group squared	0.00245***	0.00325***	0.00128***	0.00340***	0.00247***
Multigrade classes	-2.816***	-3.253***	-0.373	-3.072***	-4.712***
Double-shift systems	-18.51***	-20.32***	-9.859***	-18.73***	-19.03***
Mathematics and French textbooks per student	0.387***	0.387***	0.417**	0.259***	0.609***
Female head teachers	0.391	0.734**	-0.430	0.635	0.951*
Canteens in operation	-0.599*	-0.704**	0.0792	-1.267***	0.508
Students receiving meals (%)	0.0124***	0.0118***	0.0200*	0.0138***	0.0131*
Latrines per 100 students	0.462***	0.264***	1.387***	0.397***	0.0293
Classrooms in good condition (%)	0.000470	0.00137	-0.00372	0.00228	-0.00108
Libraries	0.311*	0.470**	-0.162	0.639**	0.229
CMEF	-0.134	-0.0512	0.489	0.310	-0.641
Girls × CMEF	1.152***	0.989***	0.606	0.643*	0.980**
Number of seats per student	4.008***	3.858***	4.669***	3.536***	4.589***
School kits per student	1.405***	1.419***	-	1.528***	1.308***
School management committee	-0.381**	-0.304*	-	-0.274	-0.439
R ²	0.278	0.267	0.341	0.227	0.291
Observations	463,421	383,339	80,082	299,998	83,341

The model includes fixed effects at the school level, year level and the interaction between year and academic level.

* p<0.05, ** p<0.01, *** p<0.001

Table 6: Models based on CEPE pass rates

	(1)	(2)	(3)	(4)	(5)
	National	Public schools	Private schools	Rural public schools	Urban public schools
Girls	-2.667**	-2.899*	-0.585	-3.084**	-1.374
Average distance to school	-0.182	-0.198	-0.972	-0.881	1.257
Girls × average distance to school	0.282	0.418	-0.135	0.481	0.588
Average age	1.089***	0.0829	2.207***	-0.820***	2.260***
Students without a birth certificate	-1.811**	-2.013**	3.134	-1.308*	-12.90***
Female teachers in the school	-0.00524	0.000951	0.00661	-0.0422**	0.0305
Girls × % of female teachers in the school	0.0482***	0.0496***	0.0236	0.0446***	0.0155
Regular teachers	-1.329	9.259***	-0.603	4.856***	8.684*
School assistants	-8.011***	0.368	0.755	-0.622	2.258
Trainee teachers	-1.980*	23.93***	-3.681***	10.98***	35.07***
Teachers with a bachelor's degree or higher	2.977***	5.439***	0.110	2.229**	0.0258
Size of the teaching group	-0.155***	-0.201***	-0.157***	-0.280***	-0.195**
Size of the teaching group squared	0.000906**	0.00113**	0.000570	0.00216***	0.000820
Multigrade classes	-4.707***	-3.537***	-5.362**	-2.666***	2.216
Double-shift systems	-2.076	-1.579	-6.748	-4.779*	-3.444
Mathematics and French textbooks per student	0.936***	0.751**	-0.0698	0.356	0.0967
Female head teachers	-0.602	0.443	-1.323	0.0576	1.261
Canteens in operation	3.414***	3.758***	-0.916	2.327**	5.394***
Students receiving meals (%)	-0.0185*	-0.0161	0.0297	-0.0161	-0.00588
Latrines per 100 students	-0.789***	-0.630***	-0.985***	-0.329	-0.764*
Classrooms in good condition (%)	-0.0250***	-0.0156**	0.00141	-0.0166*	-0.00810
Libraries	0.246	0.328	-0.474	0.538	1.182
CMEF	-0.333	0.453	-0.379	0.190	-1.003
Girls × CMEF	-0.0187	-0.118	0.915	-1.165	0.439
Number of seats per student	-2.233**	-2.997***	6.937***	-2.141*	-6.221***
School kits per student	1.365***	3.019***	-	3.833***	1.735**
School management committee	-2.437***	-1.465**	-	-1.442**	-1.101
R ²	0.594	0.607	0.580	0.623	0.620
Observations	63,970	53,259	10,711	41,157	12,102

The model includes school-level and year-level fixed effects.

* p<0.05, ** p<0.01, *** p<0.001

Table 7: Models based on repetitions rates

	(1)	(2)	(3)	(4)	(5)
	National	Public schools	Private schools	Rural public schools	Urban public schools
Girls	-0.850***	-0.751***	-0.513*	-0.446	-1.694***
Average distance to school	0.0302	0.0998	0.00759	0.129	-0.0670
Girls x average distance to school	0.167*	0.110	0.0884	0.0428	0.101
Average age	0.101***	0.208***	-0.0764	0.270***	0.0782
Students without a birth certificate	-0.312***	0.0654	-0.140	0.173*	0.578*
Female teachers in the school	0.00584**	0.00613**	-0.00117	0.0124***	-0.00256
Girls x % of female teachers in the school	-0.0148***	-0.0179***	-0.00309	-0.0184***	-0.00236
Regular teachers	0.737***	0.694***	-0.116	0.929***	0.370***
School assistants	1.831***	1.620***	0.0938	1.628***	1.133
Trainee teachers	-0.252*	-3.059***	0.646***	-1.907***	-5.722***
Teachers with a bachelor's degree or higher	0.429***	-0.461***	0.321*	0.468**	-0.842**
Size of the teaching group	0.0800***	0.149***	-0.0237***	0.196***	0.0797***
Size of the teaching group squared	-0.000428***	-0.000927***	0.0000668**	-0.00138***	-0.000380***
Multigrade classes	0.313***	0.159	0.412*	0.183*	-1.628***
Double-shift systems	1.107***	1.825***	-1.058	2.887***	0.825***
Mathematics and French textbooks per student	-0.322***	-0.108**	-0.00107	-0.140***	-0.00761
Female head teachers	0.133	0.0733	0.135	-0.0268	0.211
Canteens in operation	-0.814***	-1.005***	0.275*	-0.547**	-1.554***
Students receiving meals (%)	0.0102***	0.0112***	-0.000318	0.00894***	0.0133***
Latrines per 100 students	0.224***	0.192***	0.249***	0.149***	0.245***
Classrooms in good condition (%)	0.000695	-0.000235	-0.00675**	0.00125	-0.00365
Libraries	-0.117	-0.128	-0.0215	-0.391***	0.159
CMEF	0.0721	-0.217	-0.0620	-0.363*	0.0781
Girls x CMEF	-0.421***	-0.323*	-0.179	-0.0957	-0.425*
Number of seats per student	1.838***	2.049***	0.0251	2.013***	2.164***
School kits per student	0.324***	0.163*	-	0.285***	-0.144
School management committee	0.321***	0.115	-	0.183	-0.109
R ²	0.401	0.401	0.288	0.380	0.471
Observations	583,009	478,575	104,434	375,212	103,363

The model includes fixed effects at the school level, year level and the interaction between year and academic level.

* p<0.05, ** p<0.01, *** p<0.001

Table 8: Models based on dropout rates

	(1)	(2)	(3)	(4)	(5)
	National	Public schools	Private schools	Rural public schools	Urban public schools
Girls	-0.403	0.0147	-0.998	0.468	-1.301
Average distance to school	-0.149	-0.318*	0.220	-0.501**	0.429
Girls x average distance to school	0.315*	0.105	0.710*	-0.0513	0.264
Average age	0.818***	0.778***	1.092***	0.695***	0.927***
Students without a birth certificate	-1.258***	-1.191***	-1.831***	-1.120***	-1.144**
Female teachers in the school	0.0245***	0.0331***	-0.0144	0.0299***	0.0342***
Girls x % of female teachers in the school	-0.0250***	-0.0265***	-0.0188**	-0.0212***	-0.0133**
Regular teachers	0.157	-0.238	-0.171	-0.413	0.0609
School assistants	-0.190	-1.283***	0.733*	-1.228**	-2.095*
Trainee teachers	-1.026***	-1.396**	-0.881*	-1.615***	-1.161
Teachers with a bachelor's degree or higher	-0.878***	-1.092***	-0.304	-1.238***	-0.383
Size of the teaching group	0.476***	0.522***	0.354***	0.524***	0.448***
Size of the teaching group squared	-0.00165***	-0.00192***	-0.00113***	-0.00178***	-0.00162***
Multigrade classes	2.368***	2.746***	0.241	2.599***	4.478***
Double-shift systems	14.20***	15.23***	8.707***	13.71***	14.30***
Mathematics and French textbooks per student	-0.188***	-0.302***	-0.395*	-0.197**	-0.487***
Female head teachers	-0.332	-0.587**	0.346	-0.317	-1.026**
Canteens in operation	0.800***	0.960***	-0.0379	1.237***	0.0343
Students receiving meals (%)	-0.0138***	-0.0135***	-0.0218*	-0.0146***	-0.0129**
Latrines per 100 students	-0.588***	-0.361***	-1.469***	-0.435***	-0.217
Classrooms in good condition (%)	-0.000541	-0.00140	0.00620	-0.00145	-0.00229
Libraries	-0.0486	-0.169	0.230	-0.198	-0.105
CMEF	0.181	0.208	-0.320	0.105	0.407
Girls x CMEF	-0.696***	-0.626**	-0.543	-0.509*	-0.561
Number of seats per student	-4.598***	-4.518***	-4.727***	-4.167***	-5.236***
School kits per student	-1.630***	-1.598***	3.085**	-1.796***	-1.219***
School management committee	-0.403	0.0147	-0.998	0.468	-1.301
R ²	0.288	0.266	0.350	0.241	0.288
Observations	455,364	376,017	79,347	294,229	455,364

The model includes fixed effects at the school level, year level and the interaction between year and academic level.
* p<0.05, ** p<0.01, *** p<0.001



Appendix 3: Construction of performance variables

This study uses four performance variables. This section presents how they were constructed.

The promotion rate is the percentage of students (boys or girls) in a given class who move up to the next grade. This is a key indicator for the education system and our primary retention and progression indicator for this analysis. Students who do not move up to the next grade have either repeated a grade or have dropped out of school.

The promotion rate is calculated by tracking a cohort of students at the school or school-group level, separately for girls and boys, over the school years: students who are at educational level t in year N should be at educational level $t+1$ in year $N+1$. The promotion rate can thus be estimated by comparing the enrolment of two consecutive school years for two consecutive pedagogical levels for the same school. Students repeating a class in year $N+1$ are subtracted from the total number of students enrolled because they are not part of the cohort of students who have just moved up.

This method of estimating the promotion rate gives satisfactory results, but may be biased if there are errors in the number of students enrolled or the number of students repeating a year. Moreover, it is impossible to know the number of new students enrolled in the school or whether students who leave the school drop out or transfer. Therefore, the promotion rate can be higher than 100 per cent if students arrive from other institutions. We assume that moving schools is uncommon and that changes in the promotion and dropout rates capture differences in performance across schools. The promotion rate cannot be calculated for CM2 because we do not know if students move on to the secondary level.

We were able to calculate the promotion rate for 15,352 school groups or schools and 501,725 observations. It was less than 0 per cent in 0.6 per cent of cases and greater than 100 per cent in 26 per cent of cases. For analysis purposes, outlier promotion rates, i.e., greater

than 150 per cent or less than 0 per cent (i.e., 6 per cent of observations), were removed from the analysis and those greater than 100 per cent were capped at 100 per cent.

It should be noted that a promotion rate of 81.2 per cent is calculated for the 2018/19 year, while the Department of Studies, Planning and Statistics (2020) report indicates a promotion rate of 86.1 per cent for that year. The two figures differ because we calculate the promotion rate at the school level, while the Department of Studies, Planning and Statistics calculates it at the aggregate level.

In our case, this allows us to model school performance, but not to reliably calculate the national promotion rate; because we do not have information on transfers between schools, we therefore eliminate extreme values from the analysis.

Repetitions are reliably reported for all classes. A high repetition rate may indicate students' academic failure. However, decisions about repetition are made at the school level, and whether or not a student repeats a grade does not necessarily mean there is the same level of learning in different schools.

Finally, the dropout rate jeopardizes schooling for all. The data do not directly capture the number of dropouts, so to calculate this figure, we capped the repetition and promotion rate at 100 per cent. The dropout rate should therefore be interpreted as the proportion of students who will not be in the same school the following year. We are aware that some of these students will not really have dropped out, but rather changed school. However, analysing this indicator in conjunction with the repetition rate allows us to distinguish the factors that influence these two aspects of non-promotion.

For dropouts and repetition, all values above 100 per cent were removed from the analysis (0.16 per cent and 0.4 per cent of observations, respectively).



Appendix 4: Rating the reliability of results for the education policy simulations

Four criteria were used to evaluate the models' results: 1) stability of coefficients across the different models; 2) robustness of results when the model is specified differently (see **Figure 9** and **Figure 10**); 3) data quality; and 4) risk that the results are due to uncontrolled confounding factors in the model (endogeneity). Two researchers independently scored each dimension on a scale of 0 to 3, and the average of the two scores was used. The sum of the four dimensions gives a total score out of 12. We consider that a score of nine or above suggests good reliability of the results (dark blue), a score of nine to six inclusive

suggests average reliability (light blue) and a score of less than six suggests poor reliability (red).

To assess the stability of coefficients, we estimated the models using an ordinary least squares (OLS) estimator without control variables (red in the figures), an OLS estimator with all control variables (blue), and an OLS estimator with fixed effects and control variables (green). The results tables show an OLS estimator with fixed effects and control variables. We have provided the other specifications to show the effects of introducing more controls into our models.

Figure 9: Stability of coefficients in models for promotion rates in public schools

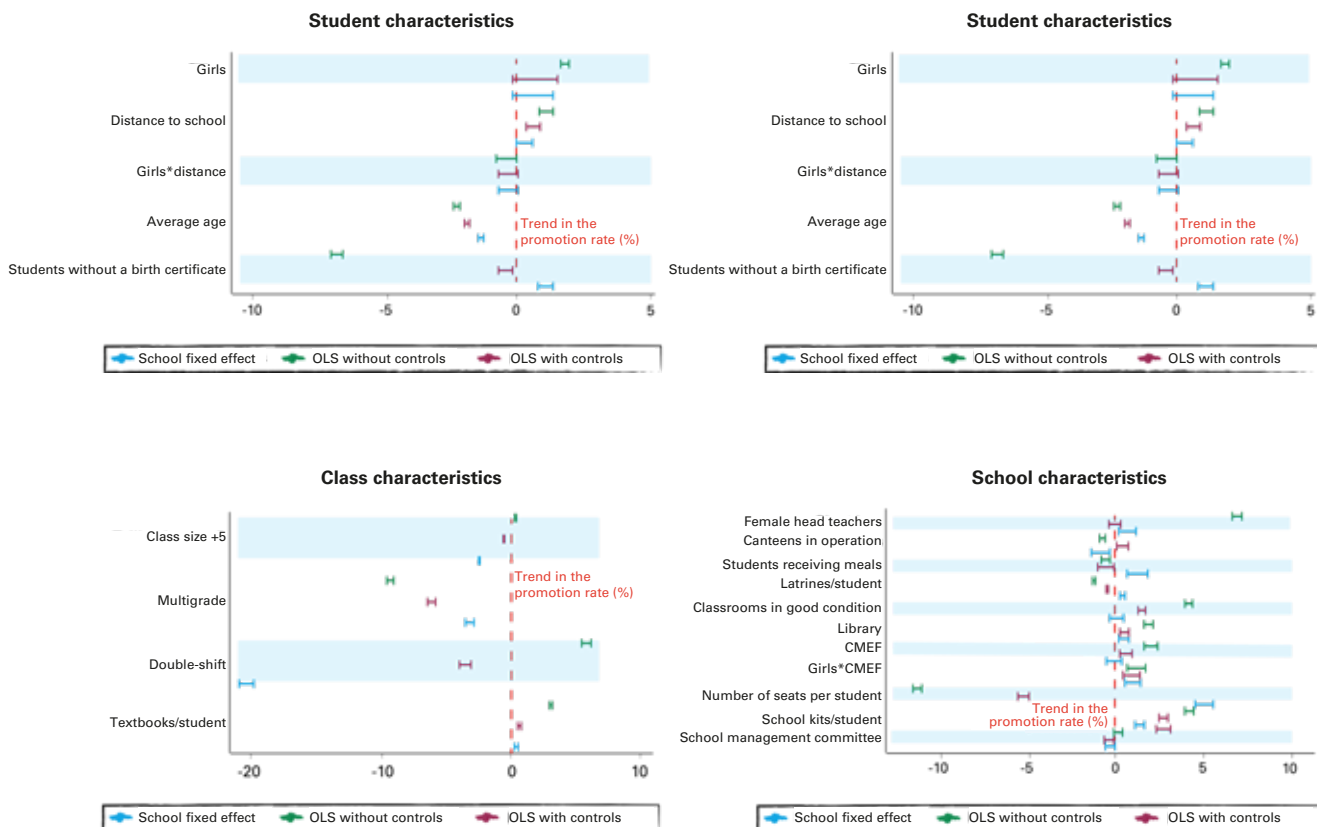
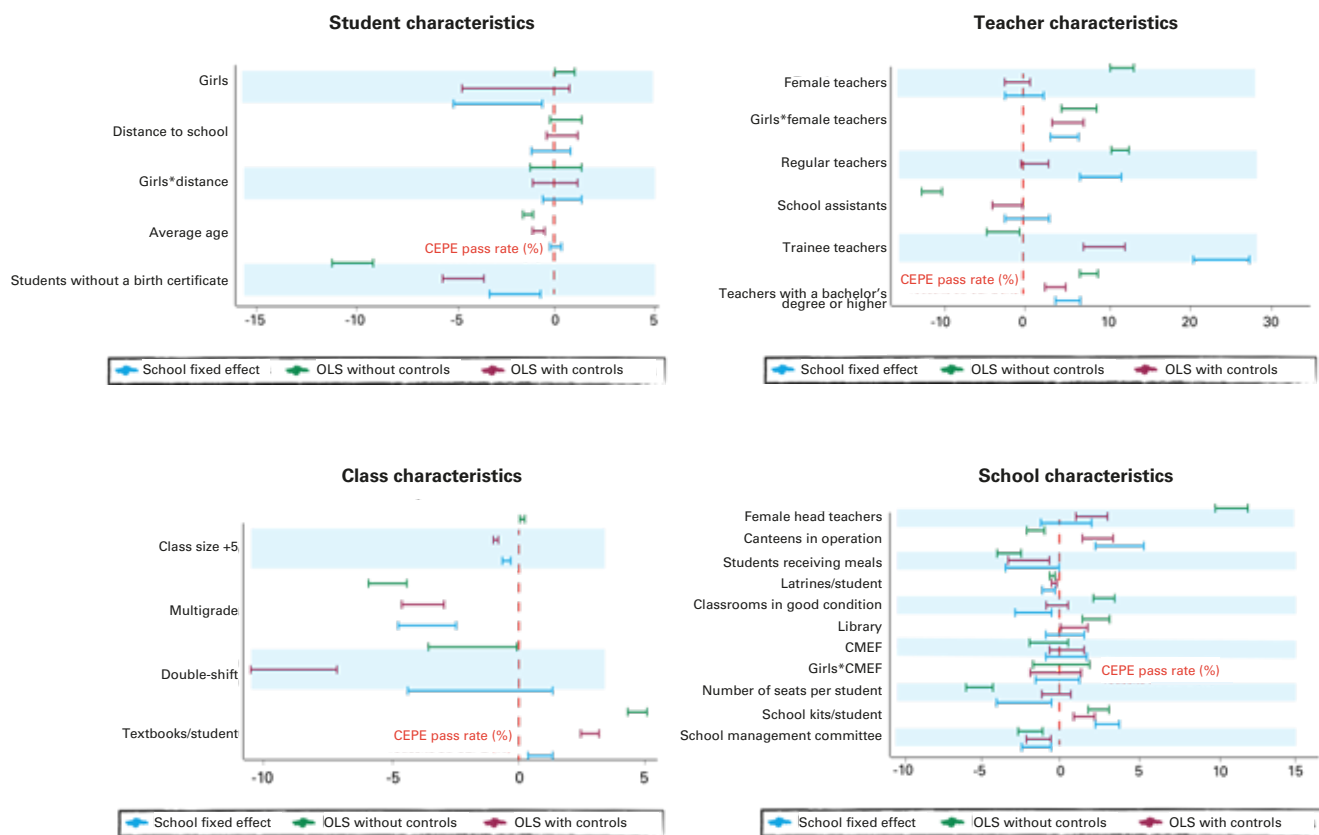


Figure 10: Stability of coefficients in models for the CEPE pass rate in public schools



Appendix 5: Data-collection process, information compiled in the database and database construction

Since 2012, MENA has managed to release administrative data within six months of the start of the school year. The data-collection process follows several stages:

Stage 1	Review and print questionnaires
Stage 2	Ensure cascade training for production-line officials and distribute questionnaires
Stage 3	Collect and enter data
Stage 4	Clean and consolidate data collected
Stage 5	Produce and disseminate deliverables

The data-collection process begins by reviewing and printing the questionnaires in grade order. This first stage allows us to update the data-entry form by adding or deleting certain variables, depending on the context. This is followed by a practical test in the regional education directorates to ensure that the tools developed are effective.

Once the questionnaires have been reviewed and printed, we carry out the production-line training activity, which has five main stages:

Stage 1	Officials at the central Department of Studies, Planning and Statistics are trained.
Stage 2	Department of Studies, Planning and Statistics officials train statistics coordinators in the regional and departmental directorates of education.
Stage 3	Regional statistics coordinators train statistics officers from the inspectorates of preschool and primary education, as well as public and private school head teachers.
Stage 4	Inspectorates of preschool and primary education statistics officers train education sector advisers.
Stage 5	Education sector advisers train preschool and primary school head teachers.

For preschools and primary schools, the head teacher completes the paper questionnaire, as the school is the unit of analysis. At the general secondary level, the principal is responsible for this exercise. Regional education directorates and departmental education directorates collect and enter data, under the supervision of officials from the Department of Studies, Planning and Statistics. All data are entered online on the STATMENET 2.0 platform. During this stage of the process, the Department of Studies, Planning and Statistics ensures that the data collected in schools, inspectorates of preschool and primary education, departmental education directorates and regional education directorates are complete, consistent and reliable.

The data are then cleaned, which involves several data-verification sessions with regional statistical coordinators from the regional education directorates and departmental education directorates.

These data are then consolidated and disseminated in the form of several deliverables:

- official presentation of the data to the whole education community
- development of statistical notebooks
- production of statistical yearbooks
- statistical analysis report
- production of regional deliverables

The various deliverables are available online on the Department of Studies, Planning and Statistics website.



Appendix 6: Process of merging data sets and developing variables

A. Assigning a unique code to all schools through matching

Although the Department of Studies, Planning and Statistics created a new unique school code in 2017, it was not stable for all schools until 2021/22. To be able to track the same school over time, the research team overcame this challenge by using probability merging based on school names.

Probability merging, also known as ‘fuzzy merging’, compares the letters in a name and matches the names with the most similarities. Since the Côte d’Ivoire data set

is very well documented, we were able to incorporate other characteristics, such as the school’s locality, commune, district or region, the year the school was founded and any name changes. This wealth of additional information allowed us to make reliable matches and avoid merging two schools that share similar names but are clearly different. Overall, nearly 89.3 per cent of the schools that existed in 2017/18 could, over time, be matched, with an average confidence level of over 95 per cent. This means that, overall, 71.4% of schools in the database could be merged for the five years.

B. Considering the school group as a school entity

When they become too large, schools in Côte d'Ivoire are divided into several units, which tend to keep the root of their name and add a number to it, to indicate their connection. For example, if a school named EPP Abidjan is divided into units, the new schools may be named EPP Abidjan 1 and EPP Abidjan 2. The units also become a school group (if they were not already), which makes it possible to follow schools that have been divided and to determine their administrative status.

When schools are divided, it is not possible to ascertain which unit the children went to, or whether the teachers migrated from one

unit to another. To make it easier to track student cohorts over time, school data are aggregated at the school-group level. On average, 40 per cent of schools are part of a school group, and such groups include an average of 2.7 primary schools (see **Table 9**).

Once the team aggregates the school information at the school-group level, some variables are treated as averages and others as sum totals. Data on students are calculated as a sum (enrolment, number of students receiving meals, number of students without a birth certificate, etc.) and data concerning school infrastructure are calculated as an average (presence of a library, CMEF, etc.).

Table 9: School-group statistics

	2017/18	2018/19	2019/20	2020/21	2021/22
Total number of primary schools	17,010	17,214	18,266	18,755	19,134
Number of primary school belonging to a school group	7,020 (41%)	7,212 (42%)	7,645 (42%)	7,706 (41%)	7,687 (40%)
Average number of schools by school group (primary and preschool) belonging to a school group	3.24	3.25	3.27	3.25	3.34
Average number of primary schools per school group (primary only)	N/A	N/A	N/A	2.61	2.67





8. References

References

- Bergmann, Jessica, Maria C. Alban Conto and Mathieu Brossard, *Increasing Women's Representation in School Leadership: A promising path towards improving learning*, UNICEF Innocenti – Global Office of Research and Foresight, 2022.
- Department of Studies, Planning and Statistics, *Rapport d'analyse statistique, système éducatif ivoirien 2020*. Ministry of National Education, Technical Education and Vocational Training of Côte d'Ivoire, 2020.
- International Institute for Educational Planning Pôle de Dakar, *L'allocation et l'utilisation des enseignants en Afrique*. United Nations Educational, Scientific and Cultural Organization, 2016.
- Martínez Martínez, Miryam, Manuel M. Molina-López and Ruth Mateos de Cabo, 'Explaining the Gender Gap in School Principalship: A tale of two sides', *Educational Management Administration & Leadership*, vol. 49, no. 6, November 2021, pp. 863–882.
- National Institute of Statistics, *La situation des femmes et des enfants en Côte d'Ivoire. Multiple Indicator Cluster Survey 2016 – MICS 5*. Ministry of Planning and Development of Côte d'Ivoire, 2016.
- Programme for the Analysis of Education Systems, *PASEC 2014 – Education System Performance in Francophone Sub-Saharan Africa: Competencies and learning factors in primary education*. Conference of Ministers of Education of French-speaking States and Governments, Dakar, 2015. Available at <https://pasec.confemen.org/en/ressource/pasec2014-education-system-performance-in-francophone-sub-saharan-africa-competencies-and-learning-factors-in-primary-education/>.
- Programme for the Analysis of Education Systems, *PASEC 2019 – Quality of Education Systems in French-Speaking Sub-Saharan Africa: Teaching/ learning performance and environment in primary education*. Conference of Ministers of Education of French-speaking States and Governments, Dakar, 2020. Available at www.confemen.org/rapport-international-pasec2019.
- Rossiter, Jack, et al., 'Do High-Stakes Exams Promote Consistent Educational Standards?', Working Paper Series No. 581, Center for Global Development, May 2021. Available at www.cgdev.org/sites/default/files/do-high-stakes-exams-promote-consistent-educational-standards.pdf.
- Tresore, M., 'Cantines scolaires en Côte d'Ivoire : L'approvisionnement, un réel défi pour la pérennisation', *Fraternité Matin*, 29 August 2022. Available at www.fratmat.info/article/223320/societe/cantines-scolaires-en-cote-divoire-approvisionnement-un-reel-defi-pour-la-perennisation.
- Wagner, D.A., N.M. Castillo and S. Grant, eds., *Learning Marginalization and Improving the Quality of Education in Low-Income Countries*. Open Book Publishers, Cambridge, UK, 2022.
- World Food Programme Country Office in Côte d'Ivoire, *Decentralized Evaluation: Mid-term evaluation of 'Support for the Integrated School Feeding Program' in Côte d'Ivoire*. January 2019. Available at www.wfp.org/publications/cote-divoire-school-feeding-mid-term-evaluation.



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