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What Role for the Private Sector in Liberia's Public Education Policy?

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What role for the private sector in Liberia's public education policy?

Mounir Siaplay and Eric Werker[1]

September 26, 2013

Executive Summary

The purpose of this paper is to explore whether Liberia's rich history with private and mission schools presents an opportunity today to improve the educational outcomes of students across both public and private schools. Using household survey data, Ministry of Education census reports, West African Examination Council exam scores, and open-ended interviews, we establish a number of stylized facts. Richer, more urban students attend private and religious schools, but these schools are nonetheless accessed by most income quintiles. Public education reaches more students, particularly poor students in rural areas, but is expanding its footprint in the cities as well. Standardized test results have been stronger in private and religious schools, but the gap appears to be closing. Despite strength in Liberia's private and mission schools, government policy appears to be distorting the market for both teachers and students through rapidly rising teacher salaries and school lunch programs. We discuss the potential for a voucher system to encourage school choice and healthy competition between public and private schools, and suggest a pilot program to measure its effects in Liberia.

[1] Mounir Siaplay is Country Economist for the International Growth Centre (IGC) program in Liberia. Eric Werker is Associate Professor at Harvard Business School and Lead Academic for the IGC program in Liberia. We are grateful to the IGC for funding this study. No funds beyond those used to sustain the Liberia program were used to finance this research.

1. Introduction

Liberia's history of conflict, limited state capacity, and poverty has not bequeathed a strong education sector. Anecdotes of low literacy, under-resourced classrooms, and university graduates with poor writing and quantitative skills abound. Yet there is a silver lining. From Liberia's earliest days, for reasons tied directly to that history, non-government run schools have flourished. Through today, Liberia has multiple school systems and numerous individually-run schools, each undertaking the tasks of educating students with different methods and styles. It may be the case that this variety in educational approaches, and the multiplicity of systems could be Liberia's best asset for educating its youth in the most efficient, appropriate ways going forward.

The purpose of this paper is to explore whether Liberia's private and mission schools present an opportunity to drive improvements across the educational system, including the government-run schools which educate the majority of its students. We assembled all available information that we could in order to find out which Liberians attend private or mission schools, whether these schools do a better job of educating their students, whether they are cost effective, and how current public policy facilitates their success. Our goal is not to provide a definitive answer, but rather to facilitate a discussion and stimulate interest in more rigorous research that could better inform Liberian policy makers on the best way forward.

As early as the 1960s, Liberia's educational system was characterized by structural weakness and fragility that included inefficient administration, underpaid and untrained teachers, and lack of infrastructure maintenance (Lanier, 1961:256). Such a description would remain accurate today: these problems worsened during the prolonged civil war that severely damaged Liberia's infrastructure, killed and displaced its citizens including teachers and students. The war also left a portion of its youth homeless and uneducated for years (Johannessen, 2006). By the end of the war in 2003, 30 percent of public schools and 24 percent of community schools were destroyed, and 16 percent more schools lost desks, chairs, and other basic educational inputs to looting (International Institute for Educational Planning, 2011). Many trained teachers fled during the war, increasing the students-to-trained-teachers ratio.

One common narrative of the war is that school participation fell dramatically, leading to an entire generation of children and young adults not having the opportunity to attend school but instead participate in the war as child fighters (International Institute for Educational Planning, 2011). However, this narrative does contrast with the World Development Indicators data on adult literacy, which show a steady climb from 32 percent of the population in 1984 to 61 percent in 2010. It also conflicts with the Barro-Lee data on average years of total schooling for the adult population, which similarly show a consistent increase from 1 year in 1970 to 3.9 years in 2010.[2] It is possible that refugees from the Liberian war were able to get superior education, or that basic education continued to expand or improve in spite of the conflict. Regardless of the effect of the war on educational outcomes, today's situation remains one of the worst in the world. About 60 percent or more than half a million of Liberia's workforce did not complete primary school, only 13 percent of the population has some technical or vocational education training, and the literacy rate is below the regional average. Low human capital is a binding constraint to inclusive growth (Graham, Garrido, and Karjanlaht, 2012).

Since the war ended in 2003, the Government of Liberia (GoL) and its international partners have invested in building schools and community colleges, training teachers, and distributing educational materials. However, this has required some amount of paddling upstream: between the 2005/2006 and 2008/2009 school years, public school enrollment increased by 48 percent, of which 33 percentage points was female.[3] This has been caused in part by the Education Act of 2001, which made primary education compulsory, and by the 2006 elimination of school fees.[4]

Although they fly mostly under the radar of policymakers and donors, mission and private schools constitute a significant part of the education system in Liberia. Since Liberia's emergence as a modern state in the 1800s, mission schools have played a major role in educating Liberians (as well as disseminating their religious views). These schools receive some support from church organizations or religious non-government organizations but are funded primarily through tuition and fees. The mission schools are organized into mini school systems, and are

[2] World Development Indicators online. Accessed: June 5, 2013.
[3] Department of Research and Planning, *Status of Education System in Liberia (2005/2006-2008/2009)*. Liberian Ministry of Education, 2010.
[4] Scott, Aldophus, 'Never to late to learn, 2008. [Access on May 16, 2013 from http://www.unicef.org/infobycountry/liberia_42354.html]

broadly representative of religious beliefs in Liberia, including: Methodist, Catholic, Baptist, Lutheran, Islamic, Seventh Day Adventist, Assembly of God, and Inland Mission school systems. On the other hand, private schools established in Liberia operate as business enterprises with profit motive as the main objective (Johannessen, 2006). Private schools have been able to compete with public schools by hiring trained teachers and offering smaller class sizes. Many of Liberia's parents choose to send their children to mission or private schools in search of a better education even though the fees are high compared to public schools. Today, mission and private schools educate the majority of secondary school students, and a large minority of primary school students.

To harness the strengths of private education providers to improve education for all students, some governments in developing and developed countries have embraced the idea of voucher systems. The voucher system allows the private sector to provide education that is publicly financed, and at the same time imposes competitive pressures on government education, which can otherwise go unchecked as a monopoly operating in a context without market signals to provide feedback (Friedman, 1955; Chubb and Moe, 1990; Walberg and Bast, 2003). For example, Colombia's PACES was established in 1991 to provide low-income students with vouchers to attend private schools conditional on the student's academic achievements. Angrist, Bettinger, and Kremer (2005) show that the PACES program increased the secondary school completion rate by 15 to 20 percent and test scores for college admission tests by two-tenths of a standard deviation in the distribution of potential test scores.

From what we can tell, rather than encourage competition between public and private/mission schools, government policy in Liberia is distorting the once rich market for the private provision of education. Increases in teacher salaries, while laudable, may be making it harder for private/mission schools to attract and retain qualified teachers. Similarly, the admirable school feeding programs are targeted only towards government schools, so at the margin attract students who might otherwise be entering the private school system. While of course their net impact may be largely positive, these two interventions seem to have weakened the ability of private/mission schools to attract and retain teachers and students.

The rest of the paper is organized as follows. We summarize international evidence on public policy toward private education in section 2. Section 3 summarizes basic statistics around the different types of schools in Liberia. Section 4 analyzes the relationship between household wealth and children's school enrolment in Liberia. Section 5 presents students' performance statistics on the WAEC examination by type of school and in each county. Section 6 compares the cost of educating a student in public versus private schools. The current public policy in Liberia towards private and mission schools is discussed in section 7. Section 8 concludes.

2. International Evidence on Public Policy toward Private Education

The quality of public education has been a major concern both in developed and developing countries over the years. In the United States, widespread concern about the quality of education, particularly among schools attended by minority and low-income students, has generated demands for educational reforms (Belfield and Levin, 2002). In Sub-Saharan Africa and Asia, poor—and sometimes deteriorating—school quality has led increasing numbers of parents to send their children to private schools, which in South Asia has been called a "mass exodus" (Tooley and Dixon, 2005, p.3). Rather than fight this trend, some governments in developing and developed countries have embraced the idea of voucher systems so as to harness the power of competition to improve school outcomes. Harvard professor Lant Pritchett, in a forthcoming book on education in the developing world, describes the public, centrally controlled education bureaucracies as "organizational dinosaurs" and argues for new systems that encourage flexibility and competition (Pritchett, forthcoming). In this section, we focus on the rise of market-driven and voucher-driven private schooling.

The rise of market-driven private schools in developing countries is attributed to a poor alternative in public education which is plagued by high students-to-trained-teacher ratios, high levels of teacher absence (one survey in India found that on a given day one-quarter of government primary school teachers were simply absent from school), poor quality teaching, entrenched bureaucracy, and unionized teachers (Chaudhury et al., 2006). In response, private schools are springing up and more parents are sending their children to private school in spite of its cost. For example, Rangan and Lee (2012) examine the recent trend in franchise-like private schools in Kenya. They focus on Bridge International Academies which was established in 2007

by three education entrepreneurs[5] to provide high-quality, low-cost education (tuition fees of $4.00 per month which include Saturday morning tutoring, compared to "free" government education which levies more than $3.00 in fees each month) to the urban poor in Kenya. To date, Bridge International operates a total of 26 schools in the slums of Nairobi, making it the largest private school operator in Kenya. Given its current success, Bridge International is considering possible expansion to Uganda, Ghana, Nigeria, Malawi, and Ethiopia.

Some education scholars have argued for reforms that would give parents and students private alternatives, thus enhancing parental involvement, improving student outcomes and school effectiveness, and in the process improve public schools through competition (Chubb and Moe, 1990; Driscoll and Kerchner, 1999; Smrerkar and Goldring, 1999; McEwan and Carnoy, 2000; Levin, 2002; Hoxby, 2003; Hsieh and Urquiloa, 2003). Consequently, a small number of governments in developing and developed countries have embraced the idea of voucher systems, in which students can either attend public school or apply a state-funded voucher to cover or defray the cost of private school attendance. This system is not without its detractors. Critics of such "school choice" argue that it produces "social fragmentation" of society and a two-tiered education system (Gewirtz et al., 1995; Fuller et al., 1996), allowing the middle class to use the education market to further enhance their social status (Ball, 2003).

A handful of extensive studies have tried to measure the effect of vouchers on student achievement. Mizala and Romaguera (2000) show Chile's voucher-type system closed the performance gap between publicly financed schools and fee-paying private schools. Greene, Peterson, and Du (1999) found that Milwaukee's voucher program produced superior academic outcomes for students using vouchers to attend private schools. Gallego (2002), and Auguste and Valenzuela (2003) found that Chile's voucher program significantly increased competition between public and private schools and improved student test scores. Angrist, Bettinger, and Kremer (2005) show that Colombia's PACES program, which provides vouchers to students from low-income families to attend private schools (conditional on the student's academic achievement), increased the secondary school completion rate by 15 to 20 percent.

[5] Jay Kimmelman, a Harvard alum, is the founder of Edusoft Company which provides educational assessment software. Shannon May has a Ph.D. in anthropology from the University of California Berkeley. Phil Frie, an MIT alum, founded and ran a new business unit at IDEO, an international design consultancy, to commercialize and promote new technologies.

Not all the results are glowing. Cullen, Jacob, and Levitt (2006) examined the impact of school choice on participation in Chicago public schools. They employed randomized lotteries to determine high school admission in Chicago public schools: students who won the lotteries attended high schools that have higher attainment level and student performance than students who lost the lotteries. Results indicate that students who won the lotteries did not perform better on standardized exams than students who did not win. Bifulco and Ladd (2007) examined the effects of parental school choice and racial segregation on the gap between white and black student test scores. The results indicated that unrestricted parental choice policies led to segregated schools with larger negative effects on the achievement of black students than on white students. While racial segregation from a voucher system is not an issue for Liberia, ethnic and religious segregation is a potential concern, particularly since many non-government schools are religious in identity. Rouse and Barrow (2009) argue that the best research on school choice and student achievement gains from vouchers is relatively small and not statistically significant.

Overall, it seems that underperforming education systems in developing countries are ripe for innovation. Voucher-driven competition between public and private schools is one potential policy which could help Liberia work towards optimizing its overall educational system.

3. Enrollment by School Type in Liberia

The Ministry of Education census report provides detail on the state of education in Liberia including disaggregated statistics by county, type and level of school, student enrollment, and other statistics. We used the 2008-09 and 2010-11 reports to summarize enrollment statistics by type of school, students-to-trained-teacher ratios by type of school, and number of each type of school by county.

Figures 1 and 2 provide summary statistics on student enrollment in Liberia for 2008-09 and 2010-11. In 2008-09, pre-primary and primary student enrollment in public schools was nearly 700,000, accounting for some three fifths of total enrollment at this level. Private schools enrolled more than 200,000 students, and mission schools approximately 130,000 students. Over the next two years, public school enrollment grew at an annual rate of 9%, compared with growth rates of 5% and 12% at private and mission schools respectively.

At the junior and senior high school level, in 2008-09, student enrollment in public schools was approximately 67,000 accounting for 36% of the total enrollment at this level. The distribution across public, private, and mission schools was much more equal. Private schools enrolled more than 48,000 students and mission schools 61,000 students. Over the next two years, enrollment in public high schools grew at an annual rate of 13%, compared to 11% for private school enrollment and 5% for mission school enrollment.

Overall, these results indicate that public schools educate the majority of students in pre-primary and primary schools and this trend is slowly increasing. Private and religious schools educate the majority of secondary school students, but are slowly losing market share, and a large minority of primary school students.

Figure 1. Statistics of student enrollment in Liberia 2008- 2009: public, private, mission, and community schools

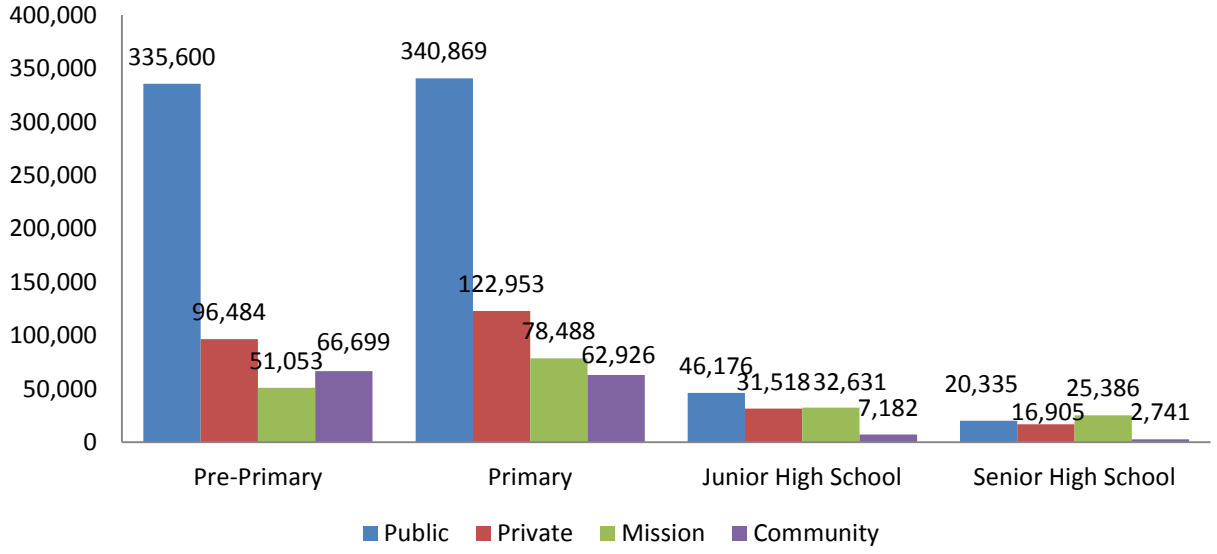


Figure 2. Statistics of student enrollment in Liberia 2010-2011: public, private, mission, and community schools

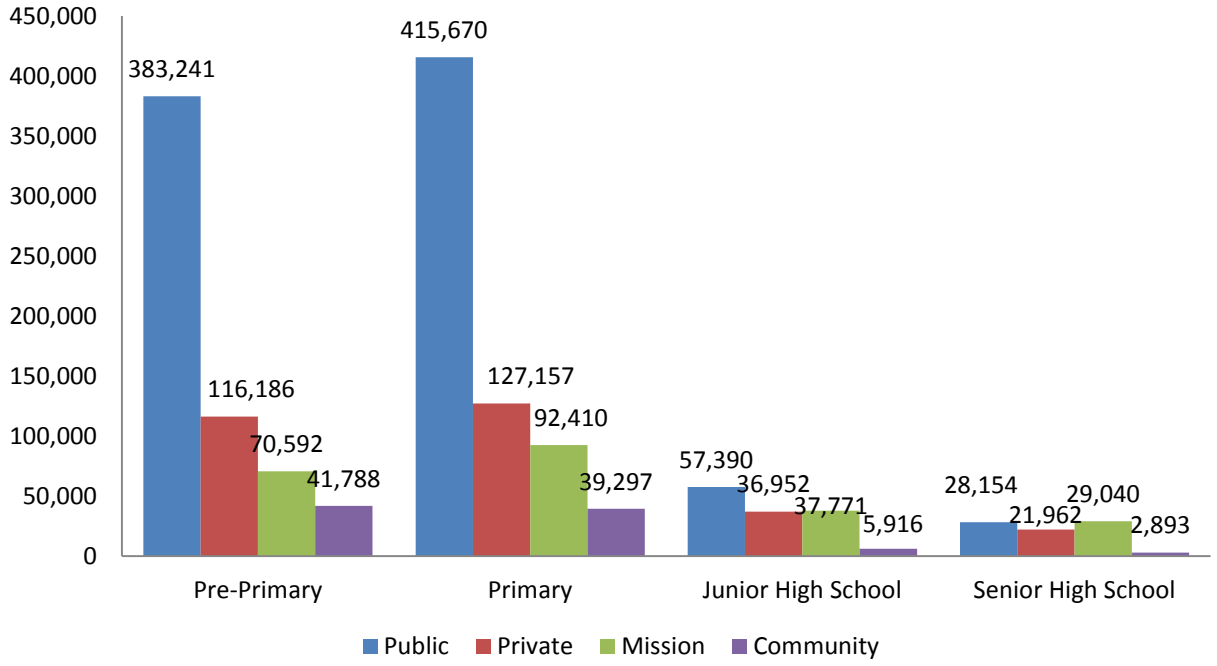


Figure 3 compares student to trained teacher ratios in 2008-09 and 2010-11 across levels of schooling by public, private, mission, and community schools. The results show that pre-primary and primary public have higher students-to-trained-teacher ratios than junior and senior high schools, but the ratio reduced significantly over the two-year interval. Given the enrollment increase observed across Figures 1 and 2, this indicates an enormous increase in trained teachers at the pre-primary and primary levels. At the junior and senior high school levels, students–to-trained-teacher ratios are significantly lower than in pre-primary and primary schools, but the ratio has increased slightly over the two-year interval. By type of school, private and mission schools have lower ratios for pre-primary and primary schools compared to public and community schools, but there is no discernible pattern at the high school level.

Figure 3. Students to trained teacher by school type: 2008-2009 and 2010-2011

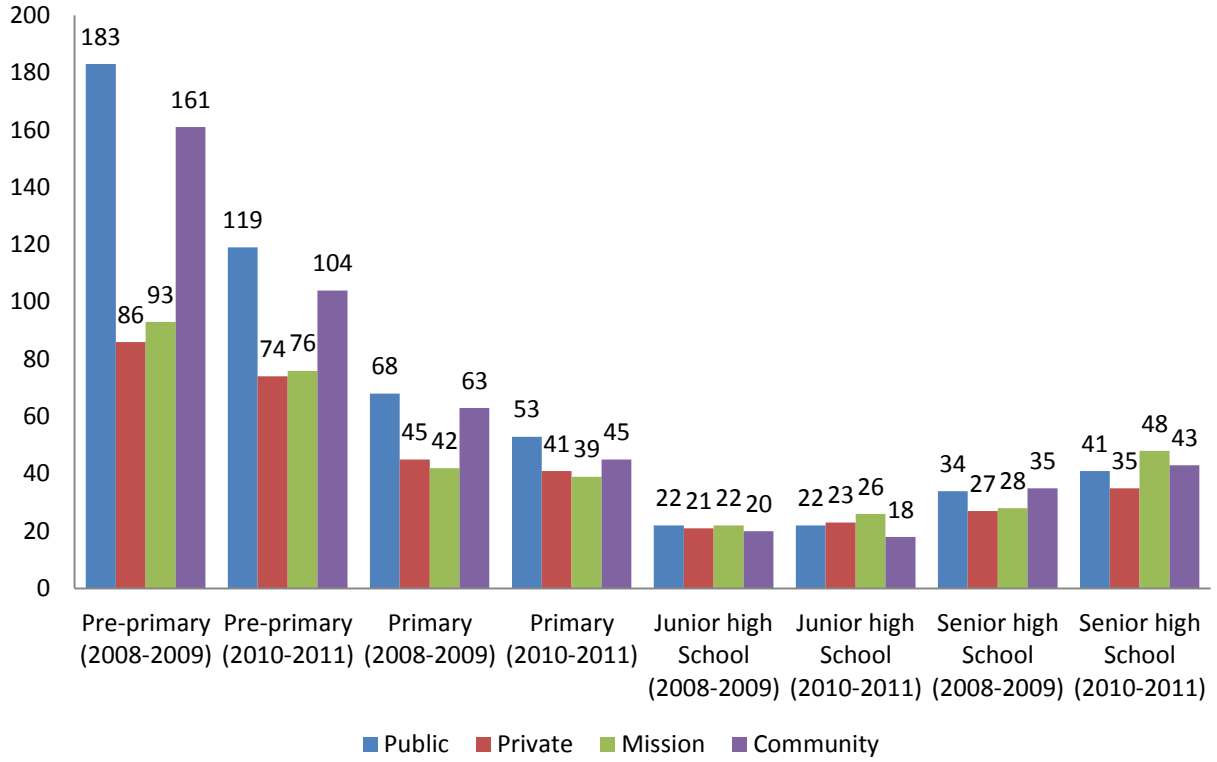
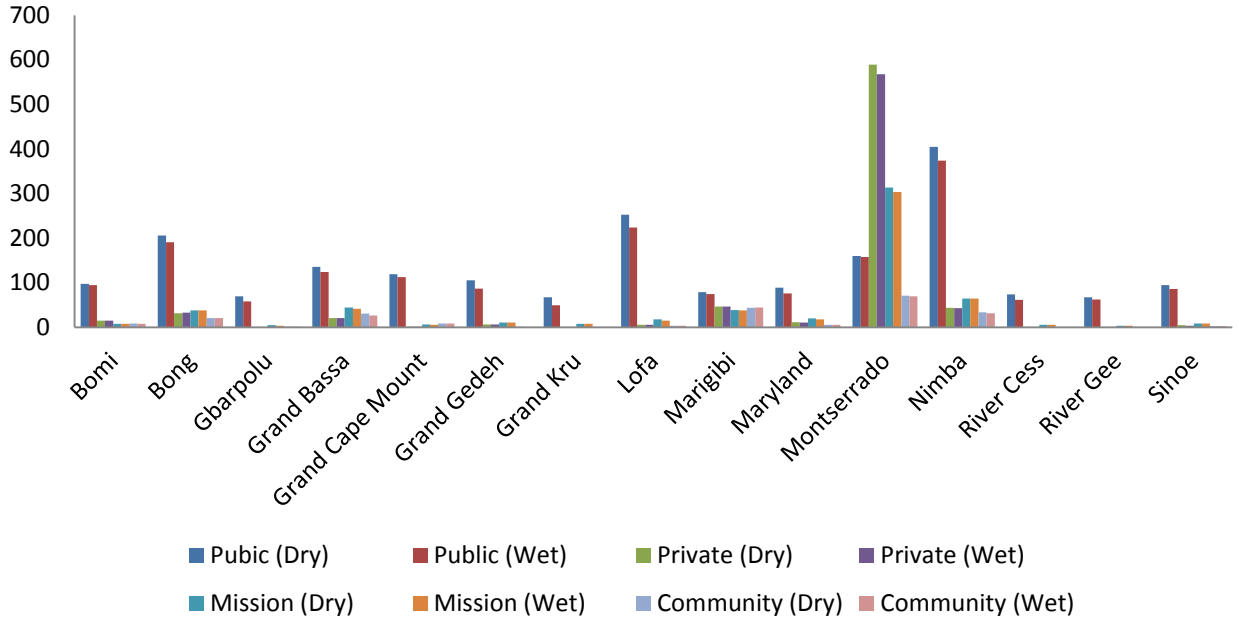


Figure 4 compares the number of schools accessible to students by type of school (public, private, mission, and community), county, and season (wet and dry). Students have significantly more access to public schools than private schools across all counties except Montserrado and Margibi. That said, all counties except Gbarpolu, Cape Mount, Grand Kru, River Cess, and River Gee have at least 10 private and mission schools, indicating a critical mass of non-government run schools across most of Liberia. Private and mission schools combined represent at least 20 percent of accessible schools in Montserrado, Nimba, Bong, and Grand Bassa counties. Rainy season access appears to be a small but persistent problem across most counties and school categories.

Figure 4. Number of schools accessible to students by type of school, county, and season in 2010-2011



4. Household Wealth and Children's School Enrollment in Liberia

We used Liberia Institute of Statistics and Geo-Information Services (LISGIS): Core Welfare Indicator Questionnaire (CWIQ) for 2007 and 2010 to examine the relationship between household wealth and children's school enrollment in Liberia. These data are the only household surveys available in Liberia. They cover a briefer version of usual household survey topics including household attributes such as assets and amenities, and individual attributes of household members such as age, gender, occupation, school enrollment, and educational attainment.

4a. *Using principal component analysis to construct asset index*

To analyze the relationship between household wealth and children's school enrollment in Liberia, we created an asset index as a proxy for wealth since income and consumption expenditure data was only available in the 2007 household survey. We constructed a linear index from household asset and dwelling characteristics, using principal component analysis to derive the weights (for more information regarding the technique, see Lindeman, Merenda, and Gold 1980; StataCorp 1999.)

Let $a*_{1j}$ to $a*_{Nj}$ [6] be the ownership of *N* assets by each household *j*. Principal component analysis normalizes the mean and standard deviation for each variable in the index such that, $a*_{1j} = (a*_{1j} - a*_1)/(s*_1)$, where $a*_1$ is the mean of $a*_{1j}$ across all households and $s*_1$ is its standard deviation. Thus, these variables are selected and expressed as:

$$a_{1j} = v_{11} * A_{1j} + v_{12} * A_{2j} + \cdots + v_{1N} * A_{Nj}$$

$$\cdots$$

$$a_{Nj} = v_{N1} * A_{Nj} + v_{N2} * A_{Nj} + \cdots + v_{NN} * A_{Nj}, \quad (1)$$

where the *A*s represents the components and the *V*s are the coefficients on each component for each variable and they do not vary across household. Next, we computed the scoring factors by inverting equation (1) for each of the N principal components to yield the following:

$$A_{1j} = f_{11} * a_{1j} + f_{12} * a_{2j} + \cdots + f_{1N} * a_{Nj}$$

$$\cdots$$

$$A_{Nj} = f_{N1} * a_{Nj} + f_{N2} * a_{Nj} + \cdots + f_{NN} * a_{Nj}, \quad (2)$$

Therefore, the first principal component expressed as an index for each household is:

$$A_{1j} = f_{11} * (a*_{1j} - a*_1)/(s*_1), + \cdots + f_{1N} * (a*_{Nj} - a*_N)/(s*_N) \quad (3)$$

Table 1 presents the scoring factors from the principal component analysis of the 28 variables which include household assets and dwelling characteristics. The assets and dwelling characteristics are coded as 0 or 1, with a 1 indicating that the household owns a particular asset or possesses a particular dwelling characteristic. For example, owning a clock/watch increases the household's asset index by 0.456, owning a car/truck increases the household's asset index by 1.096 units, and having no toilet reduces the household's asset index by 0.424 units.

[6] The notations in section 3 follow Filmer and Pritchett (2001).

Table 1. Scoring Factors and Summary Statistics: First Principle Component Variables

	Factor Scoring	Mean	SD	Factor Scoring/SD
Household Assets and Dwelling Characteristics				
Own Clock/Watch	0.220	0.369	0.483	0.456
Own Radio	0.216	0.523	0.483	0.448
Own Television	0.234	0.061	0.240	0.977
Own Mobile/Cell Phone	0.276	0.313	0.464	0.595
Own Generator	0.229	0.063	0.243	0.940
Own Mattress/Bed	0.210	0.708	0.455	0.463
Own Electric Iron	0.109	0.009	0.095	1.138
Own Charcoal Iron	0.246	0.300	0.458	0.536
Own Refrigerator	0.124	0.013	0.145	0.858
Own Computer	0.093	0.006	0.078	1.196
Own Fan	0.196	0.033	0.179	1.092
Own Sewing Machine	0.067	0.016	0.124	0.538
Own Bicycle	0.075	0.027	0.162	0.464
Own Motorcycle	0.073	0.016	0.127	0.574
Own Car/Truck	0.126	0.013	0.115	1.096
Flush Toilet	0.234	0.110	0.312	0.747
Pit Toilet/Latrine	0.068	0.353	0.478	0.142
None/Other Toilet	-0.211	0.537	0.499	-0.424
kerosene	0.108	0.448	0.497	0.216
Palm Oil	-0.242	0.303	0.460	-0.527
Low Quality Roof	-0.307	0.599	0.490	-0.626
High Quality Roof	0.307	0.400	0.490	0.626
Low Quality Floor	-0.257	0.364	0.481	-0.533
High Quality Floor	0.226	0.568	0.495	0.457
Public Tap/StandPipe	0.054	0.341	0.474	0.113
TubeWell/Borehole	0.046	0.204	0.403	0.113
Protected Well	0.009	0.151	0.358	0.025
Surface Water	-0.164	0.165	0.371	-0.441

Note: SD represents standard deviation.

We categorized individuals by asset index and created five levels of quintiles: poorest 20%, poorer 20%, middle 20%, richer 20%, and richest 20%.[7] Table 2 reports the average asset index of the poorest 20% as 18.7 units, poorer 20% as 21.2 units, middle 20% as 23.9 units, richer 20% as 26.2 units, and richest 20% as 35.8 units. The richest 20% have approximately double the asset index of the poorest 20%.

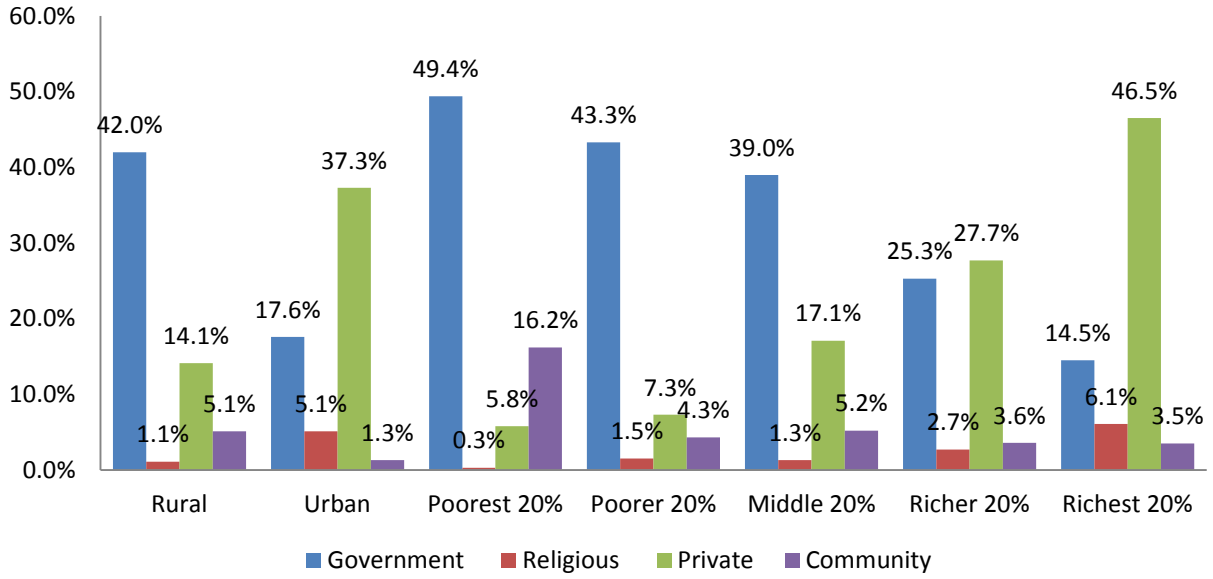
[7] These categorizations do not follow any standard level or definition of poverty.

Table 2. Household Wealth Quintiles Average in Liberia

	Poorest 20%	Poorer 20%	Middle 20%	Richer 20%	Richest 20%
Household Assets and Dwelling Characteristics					
Own Clock/Watch	0.051	0.186	0.351	0.434	0.839
Own Radio	0.108	0.347	0.559	0.647	0.917
Own Television	0.000	0.000	0.000	0.002	0.308
Own Mobile/Cell Phone	0.003	0.039	0.192	0.422	0.899
Own Generator	0.000	0.000	0.000	0.003	0.320
Own Mattress/Bed	0.267	0.594	0.776	0.909	0.992
Own Electric Iron	0.000	0.000	0.000	0.000	0.047
Own Charcoal Iron	0.011	0.093	0.203	0.390	0.840
Own Refrigerator	0.000	0.000	0.000	0.001	0.074
Own Computer	0.000	0.000	0.000	0.000	0.032
Own Fan	0.000	0.000	0.000	0.000	0.166
Own Sewing Machine	0.000	0.000	0.000	0.000	0.167
Own Bicycle	0.000	0.002	0.006	0.017	0.058
Own Motorcycle	0.000	0.000	0.006	0.010	0.071
Own Car/Truck	0.000	0.000	0.001	0.001	0.067
Flush Toilet	0.000	0.000	0.004	0.051	0.455
Pit Toilet/Latrine	0.095	0.267	0.472	0.512	0.407
None/Other Toilet	0.904	0.731	0.522	0.435	0.136
kerosene	0.081	0.324	0.593	0.726	0.533
Palm Oil	0.834	0.548	0.189	0.029	0.001
Low Quality Roof	0.998	0.986	0.857	0.229	0.033
High Quality Roof	0.001	0.013	0.142	0.770	0.966
Low Quality Floor	0.965	0.572	0.297	0.067	0.011
High Quality Floor	0.026	0.389	0.619	0.812	0.888
Public Tap/StandPipe	0.136	0.319	0.456	0.378	0.373
TubeWell/Borehole	0.112	0.190	0.197	0.242	0.273
Protected Well	0.107	0.156	0.150	0.201	0.157
Surface Water	0.531	0.187	0.091	0.040	0.007
Average	0.187	0.212	0.239	0.262	0.358

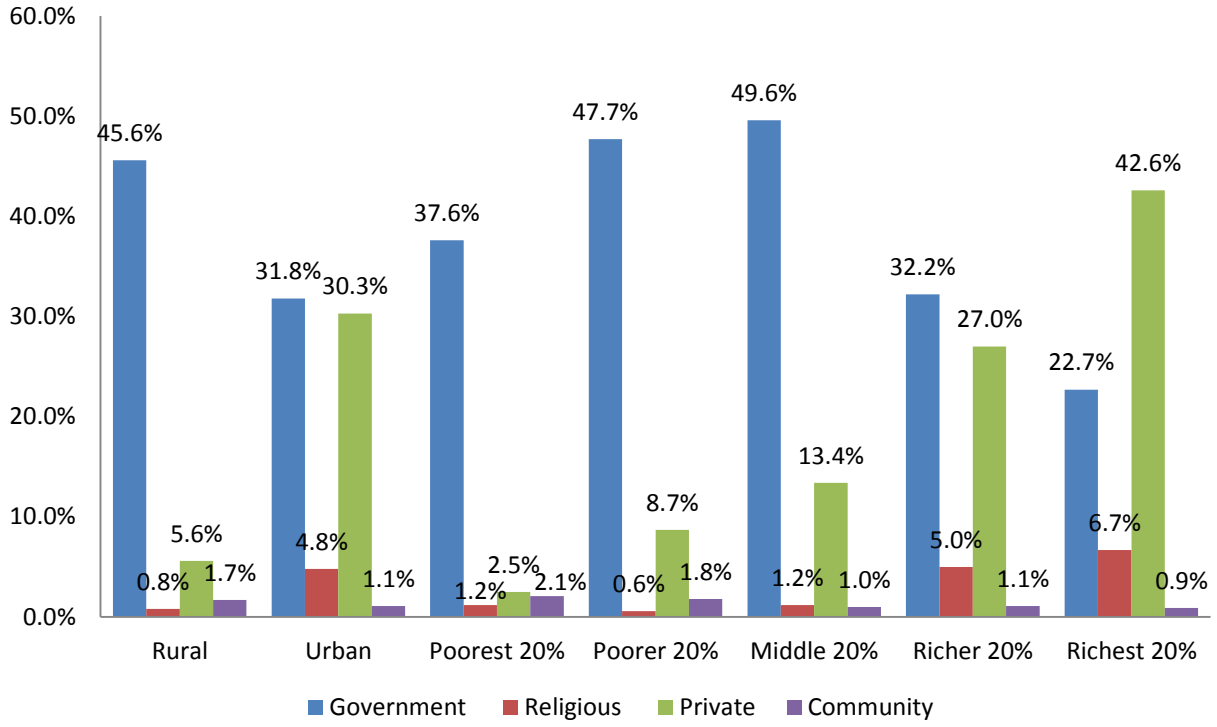
Figures 5 to 8 summarize the type of schools attended by children aged 6-14 and 15-19 in 2007 and 2010 by rural vs. urban and the wealth quintiles. Figure 5 indicates that in 2007 for children aged 6-14, government school attendance was higher in rural areas than in urban areas, while mission and particularly private school attendance was higher in urban areas. The percent attending either mission or private schools rose by wealth quintile, while the percent attending government schools fell by wealth quintile. That said, 15% of rural children and 6% of the poorest quintile were still attending mission or private schools.

Figure 5. Type of school attended by children aged 6-14: rural, urban, and wealth quintiles in Liberia (2007)



In figure 6, fast-forwarding to 2010, public school attendance increased in rural areas by 4 percentage points and in urban areas by 14 percentage points, while private school attendance fell by 8 percentage points and 7 percentage points respectively. These numbers, if true, represent a dramatic reshuffling of the educational landscape. (However, we also note that total attendance in rural areas seems to have fallen, while gaining in urban areas, so it is possible that some of the change is due to sampling differences.) In 2010, more children aged 6-14 attend public schools across the four richest quintiles compared to 2007, with the largest increases in the middle and richest quintiles.

Figure 6. Type of school attended by children aged 6-14: rural, urban, and wealth quintiles in Liberia (2010)



Figures 7 and 8 provide similar statistics as figures 5 and 6 but for youth aged 15-19. The results mirror those of figures 5 and 6: urban and richer youth are more likely to attend mission and private schools, and there is a dramatic uptick in government school attendance between 2007 and 2010. The difference from the earlier results is that there is also a marked increase in mission and private school attendance across the richest two wealth quintiles, perhaps indicating an increase in non-governmental secondary schooling (consistent with the government's focus on primary education). However, public schools have still managed to increase their market share among students even in urban areas and among the richer households in Liberia.

Figure 7. Type of school attended by children aged 15-19: rural, urban, and wealth quintiles in Liberia (2007)

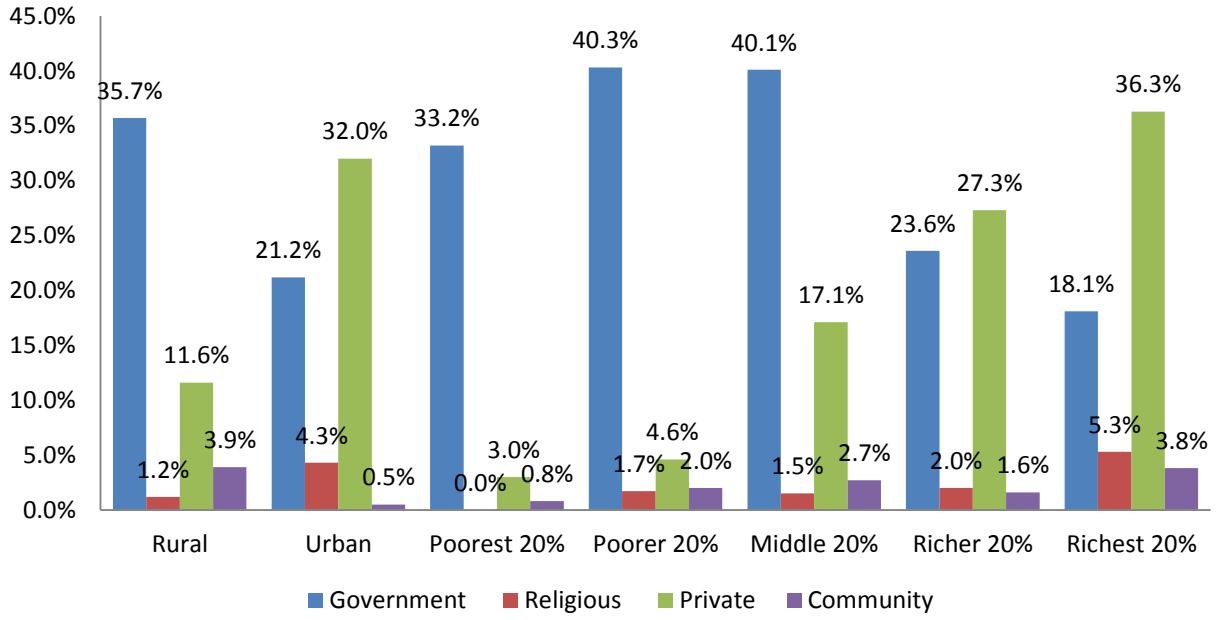
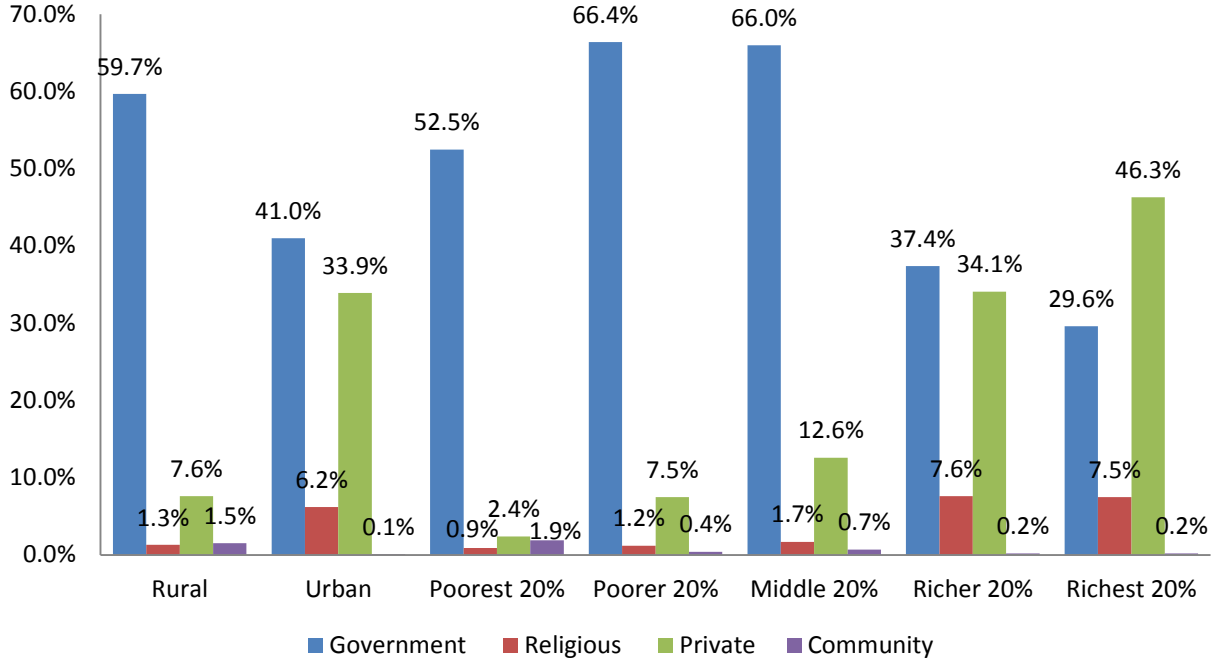


Figure 8. Type of school attended by children Aged 15-19: rural, urban, and wealth quintiles in Liberia (2010)



These summary statistics may not tell the whole story of who is attending government versus non-governmental schools; due to Liberia's conflict, extensive internal migration occurred, driving youth and perhaps males to Monrovia which could be causing some of the attendance statistics to be biased by these compositional effects. To control for these potential demographic changes, we conduct a multiple-regression model in the next section.

4b. ***Empirical model and results***

To examine the association between household wealth and the probability of attending different types of schools in Liberia, while controlling for demographics, we estimated the following probit regression:

$$Y_i^* = \sum_{q=2,5} \beta_q * Q_{iq} + \theta * X_i + \sum_{k=2,28} \delta_k * \gamma_{ik} + \varepsilon_i \qquad (4)$$

where Y_i^* is equal to 1 if the child is in school and 0 otherwise. X_i represents child and household variables including the age and gender of the child and whether or not father and mother live in the household. Q_{iq} denotes wealth quintiles ranging from the poorest 20% to the richest 20% household in Liberia. ε_i is the error term. The estimations of equation (4) are reported in tables 3 through 6.

In table 3, the 2007 results indicate that the probability of children aged 6-14 being enrolled in government school decreases as household wealth increases. (Econometrically, the omitted wealth category is the poorest quintile, so all coefficients are relative to attendance for this group.) For example, all other things equal, a rural child from the richest quintile is 74% less likely to attend government school as a child from the poorest quintile, but more than twice as likely to attend religious or private school. Rural boys are more likely to attend government schools than rural girls, who are not more likely (with any statistical significance) to attend non-government schools. For religious school attendance, rural children are more likely to attend mission schools the wealthier they are, but among urban children the very poorest are just as likely to attend mission schools as the richest 40 percent. Private school attendance increases for all levels of wealth, but only statistically significantly in rural areas. There is no discernible pattern for community school attendance by wealth except the poorest quintile is less likely to attend.

Table 3. The impact of wealth on the probability of being in School aged 6-14 living in rural and urban areas in 2007: probit regression results

	Government		Religious		Private		Community	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Poorer 20%	-1.000	-0.750*	0.3000	-0.451***	0.208	-0.330	0.642***	3.164***
	(0.118)	(0.449)	(0.391)	(0.148)	(0.150)	(0.645)	(0.219)	(0.265)
Middle 20%	-0.082	-1.076***	0.505	-0.393**	0.570***	0.269	0.801***	3.076***
	(0.133)	(0.377)	(0.358)	(0.181)	(0.166)	(0.612)	(0.195)	(0.284)
Richer 20%	-0.593***	-1.134***	0.761**	-0.139	1.126***	0.331	0.813***	3.016***
	(0.160)	(0.343)	(0.362)	(0.424)	(0.168)	(0.631)	(0.233)	(0.264)
Richest 20%	-0.740***	-1.578***	1.124***	0.198	1.278***	0.929	0.979***	3.279***
	(0.205)	(0.352)	(0.373)	(0.424)	(0.186)	(0.629)	(0.290)	(0.159)
Age	0.347***	0.309***	0.056	0.131	0.099	0.075	-0.062	0.065
	(0.080)	(0.118)	(0.192)	(0.167)	(0.110)	(0.092)	(0.112)	(0.262)
Age-Squared	-0.015***	-0.011**	-0.003	-0.007	-0.003	-0.003	0.002	-0.003
	(0.004)	(0.005)	(0.009)	(0.008)	(0.005)	(0.004)	(0.005)	(0.012)
Male	0.091*	-0.019	-0.003	-0.018	-0.076	-0.026	-0.041	0.105
	(0.053)	(0.070)	(0.138)	(0.081)	(0.069)	(0.067)	(0.071)	(0.170)
Father live in the household	0.011	0.213*	0.182	-0.020	0.032	0.060	0.352**	-0.321
	(0.099)	(0.127)	(0.322)	(0.128)	(0.122)	(0.096)	(0.138)	(0.201)
Mother live in the household	0.109	-0.015	0.183	-0.002	-0.069	0.166	-0.214*	0.307*
	(0.106)	(0.112)	(0.303)	(0.149)	(0.107)	(0.103)	(0.118)	(0.184)
Constant	-1.889***	-1.605**	-3.281	-2.171***	-2.166***	-1.447*	-1.981***	-5.749***
	(0.373)	(0.670)	(0.837)***	(0.776)	(0.549)	(0.774)	(0.543)	(1.200)
Observations	2766	1682	2766	1682	2766	1682	2766	1682

Notes: Robust standard errors in parentheses adjust for clustered at the enumeration areas. Parameter estimates are statistically different from zero at *** 1%, ** 5%, and * 10% significance levels, respectively. Reference group is Quintile 1 (poorest).

In table 4, the results suggest that by 2010 aged 6-14 enrollment predictions had changed along a couple dimensions. In rural areas, government school attendance was highest among the poorer and middle quintiles, while in urban areas it was only lowest among the top two wealth quintiles. Mission school attendance lost any significant correlation with wealth in rural areas, and remained high for the top two quintiles in urban areas. Community school attendance lost any correlation with wealth.

Table 4. The impact of wealth on the probability of being in School aged 6-14 living in rural and urban areas in 2010: probit regression results

	Government		Religious		Private		Community	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Poorer 20%	0.335***	-0.031	-0.454	-0.377	0.620**	0.289	-0.117	0.551
	(0.073)	(0.174)	(0.296)	(0.269)	(0.266)	(0.208)	(0.281)	(0.460)
Middle 20%	0.441***	0.054	-0.290	-0.040	0.971***	0.288	-0.144	0.139
	(0.129)	(0.179)	(0.243)	(0.218)	(0.166)	(0.235)	(0.355)	(0.421)
Richer 20%	0.183	-0.370*	-0.260	0.519*	1.280***	0.635***	-0.422	0.311
	(0.147)	(0.217)	(0.358)	(0.292)	(0.305)	(0.243)	(0.486)	(0.398)
Richest 20%	-0.083	-0.613***	0.127	0.604***	1.746***	1.027***	0.301	0.036
	(0.236)	(0.195)	(0.097)	(0.228)	(0.314)	(0.228)	(0.369)	(0.389)
Age	0.214*	0.251***	-0.038	-0.048	0.072	0.005	-1.131	-1.368
	(0.128)	(0.081)	(0.356)	(0.154)	(0.172)	(0.112)	(0.112)	(0.170)
Age-Squared	-0.008	-0.010**	0.003	0.004	-0.001	0.000	0.007	0.006
	(0.006)	(0.004)	(0.017)	(0.007)	(0.009)	(0.005)	(0.005)	(0.008)
Male	-0.050	-0.097**	0.134	0.089	-0.027	-0.002	-0.005	0.086
	(0.051)	(0.049)	(1.335)	(0.117)	(0.056)	(0.043)	(0.119)	(0.109)
Father live in the household	0.084	-0.037	0.247	-0.167	-0.014	0.012	0.206	0.062
	(0.068)	(0.104)	(0.174)	(0.167)	(0.141)	(0.115)	(0.194)	(0.198)
Mother live in the household	-0.241***	-0.064	-0.260	0.227	0.208	-0.079	-0.055	-0.319
	(0.087)	(0.101)	(0.196)	(0.193)	(0.139)	(0.109)	(0.306)	(0.264)
Constant	-1.352**	-1.503***	-2.232*	-2.115***	-3.082***	-1.165	-1.671***	-1.607
	(0.600)	(0.323)	(1.307)	(0.792)	(0.608)	(0.564)	(0.642)	(0.988)
Observations	2764	3575	2764	3575	2764	3575	2764	3575

Notes: Robust standard errors in parentheses adjust for clustered at the enumeration areas. Parameter estimates are statistically different from zero at *** 1%, ** 5%, and * 10% significance levels, respectively. Reference group is Quintile 1 (poorest).

Tables 5 and 6 focus on youth aged 15-19. Table 5 indicates that in 2007, the relationship between household wealth and school attendance among youth was less clear-cut than among children. The poorest quintile is less likely to be attending mission schools, and among rural youth, private school attendance is increasing in wealth. Male youths are more likely to attend government schools than females. Other relationships do not have statistical significance.

Table 5. The impact of wealth on the probability of being in School aged 15-19 living in rural and urban areas in 2007: probit regression results

	Government		Religious		Private	
	Rural	Urban	Rural	Urban	Rural	Urban
Poorer 20%	0.258	-0.529	3.847***	3.241***	0.295	-5.434
	(0.159)	(0.612)	(0.272)	(0.533)	(0.248)	(0.763)
Middle 20%	0.319*	-0.487	3.693***	3.156***	0.782***	0.181
	(0.183)	(0.596)	(0.361)	(0.386)	(0.240)	(0.662)
Richer 20%	-0.154	-0.755	4.121***	3.053***	1.320***	0.485
	(0.211)	(0.589)	(0.370)	(0.313)	(0.263)	(0.639)
Richest 20%	-0.308	-1.019*	4.416***	3.539***	1.590***	0.736
	(0.243)	(0.579)	(0.290)	(0.226)	(0.242)	(0.640)
Age	2.300	0.055	-3.168	7.410***	0.983	-0.225
	(1.501)	(2.056)	(3.540)	(2.729)	(1.975)	(1.870)
Age-Squared	-0.071	-0.005	0.098	-0.226***	-0.032	0.006
	(0.045)	(0.062)	(0.108)	(0.082)	(0.060)	(0.056)
Male	0.287***	0.335**	-0.572**	0.176	-0.128	0.048
	(0.085)	(0.132)	(0.291)	(0.143)	(0.131)	(0.113)
Father live in the household	0.175	0.242	0.001	0.071	-0.043	-0.342**
	(0.126)	(0.183)	(0.226)	(0.314)	(0.178)	(0.148)
Mother live in the household	0.025	-0.121	0.033	-0.496	0.234	0.361**
	(0.128)	(0.170)	(0.224)	(0.373)	(0.204)	(0.155)
Constant	-19.194	0.253	19.307	-65.193***	-9.455	1.039
	(12.311)	(16.793)	(28.564)	(22.481)	(16.132)	(15.351)
Observations	829	585	829	585	829	585

Notes: Robust standard errors in parentheses adjust for clustered at the enumeration areas. Parameter estimates are statistically different from zero at *** 1%, ** 5%, and * 10% significance levels, respectively. Reference group is Quintile 1 (poorest).

The results in table 6 for 2010 are similar, except there is a new, statistically significant pattern between wealth and private school attendance in urban areas as well. The male effect in government schools also diminished.

Table 6. The impact of wealth on the probability of being in School aged 15-19 living in rural and urban areas in 2010: probit regression results

	Government		Religious		Private	
	Rural	Urban	Rural	Urban	Rural	Urban
Poorer 20%	0.238	0.249	4.136***	3.470***	0.121	0.642
	(0.164)	(0.260)	(0.326)	(0.462)	(0.364)	(0.405)
Middle 20%	0.323	0.405	3.860***	3.583***	0.455	0.554
	(0.200)	(0.266)	(0.341)	(0.451)	(0.298)	(0.422)
Richer 20%	-0.190	-0.208	4.227***	4.272***	1.383***	1.039**
	(0.211)	(0.297)	(0.410)	(0.532)	(0.318)	(0.403)
Richest 20%	-0.894**	-0.401	4.868***	4.353***	1.760***	1.328***
	(0.411)	(0.306)	(0.241)	(0.414)	(0.367)	(0.405)
Age	2.481	-0.132	-4.079	6.877**	-1.909	0.920
	(2.111)	(1.411)	(2.895)	(3.139)	(2.050)	(1.545)
Age-Squared	-0.077	0.001	0.130	-2.061**	0.056	-0.027
	(0.063)	(0.042)	(0.085)	(0.094)	(0.061)	(0.046)
Male	0.181	0.051	-0.340**	0.064	-0.074	0.042
	(0.119)	(0.085)	(0.157)	(0.195)	(0.166)	(0.081)
Father live in the household	0.262	-0.205	0.003	0.812*	0.109	0.014
	(0.250)	(0.151)	(0.001)	(0.433)	(0.236)	(0.119)
Mother live in the household	-0.132	0.185	0.000	-0.197***	0.105	0.297**
	(0.231)	(0.141)	(0.000)	(0.337)	(0.356)	(0.117)
Constant	-19.736	1.478	25.658	-62.932**	14.075	-9.483
	(17.528)	(11.585)	(24.504)	(26.003)	16.993	(12.845)
Observations	672	1271	672	1271	672	1271

Notes: Robust standard errors in parentheses adjust for clustered at the enumeration areas. Parameter estimates are statistically different from zero at *** 1%, ** 5%, and * 10% significance levels, respectively. Reference group is Quintile 1 (poorest).

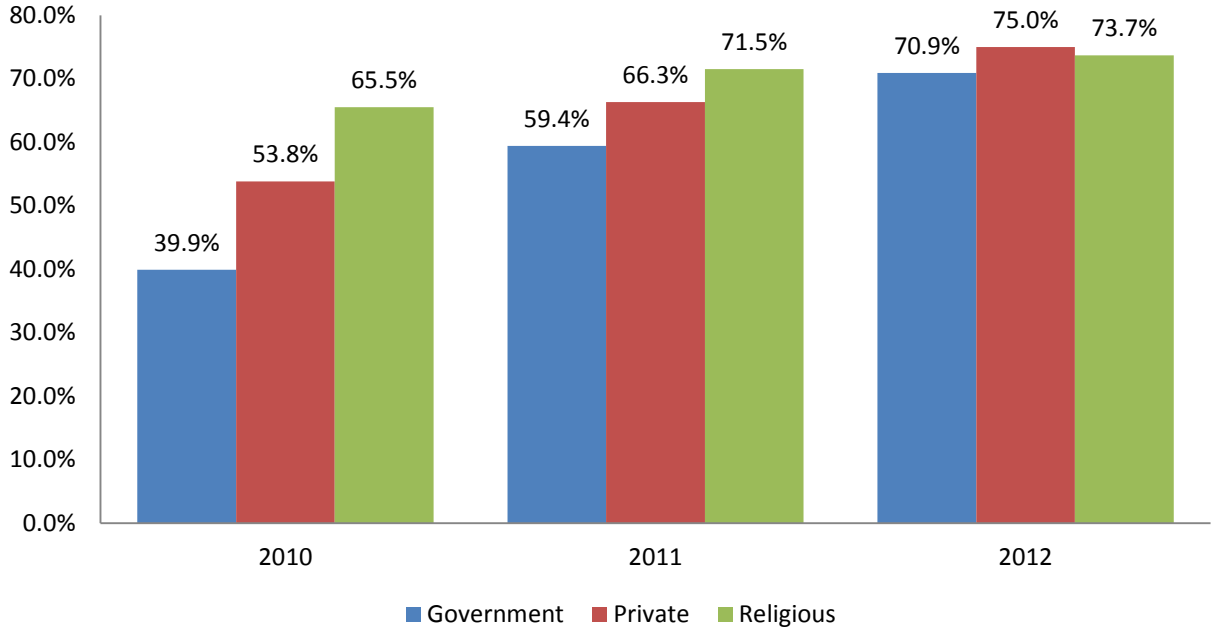
5. Student's Performance Statistics on the WAEC Exam

We examined the trend of students' performance on the West African Examination Council (WAEC) exam[8] for grade 12 from 2010 to 2012 among government, private, and religious schools.

Figure 9 shows that in 2010, students attending government schools had a passing rate of 40% on the WAEC 12th grade exam compared to 54% for private schools and 66% for religious schools. In other words, it seemed clear that either students attending mission schools were higher performers, or mission schools were providing a better education, or both. In 2011, students attending government, private, and religious schools had a passing rate of 59%, 66%, and 72%, respectively. Students across each category had improved, with government and private school averages converging to the scores at mission schools. By 2012, WAEC results show passing rates of students in government, private, and religious school of 71%, 75%, and 74%, respectively. Again, each category of school saw an improved average, with almost complete convergence to the mission school averages. If the story is this simple (and the results are accurate), this must be one of the most impressive success stories of both public and private education improvements around—particularly since education expenditures and policies have focused on primary education over this period. The story of course may be more complicated: students may get pre-screened on the exam and only be permitted to sit for the exam once they have qualified; teachers may be teaching to the test; or some other explanation. We were not able to determine the cause of this improvement, but it is worth highlighting that this impressive improvement of government schools over a very short period of time is in stark contrast to the dominant narrative of failing schools and education policy.

[8] The West African Examination Council was established in 1952 to conduct examinations and award certification in the Anglophone countries in West Africa (Liberia, Sierra Leone, The Gambia, Ghana, and Nigeria) which is comparable internationally. For more details, see http://www.waecnigeria.org.

Figure 9. WAEC 12th grade exam in Liberia: average passing rates by government, private, and religious schools in 2010, 2011,and 2012



We disaggregated the WAEC results by county and year in figures 10 through 12. However, not all the 15 counties are reflected in the figures due to the fact that some counties (River Gee, Grand Cape Mount, Grand Gedeh, Grand Kru, River Cess, and Gbarpolu) do not have the three types of schools operating simultaneously. Figure 10 shows that in 2010 private and religious schools have higher passing rates in all counties. In figure 11, the results indicate that by 2011 students attending government schools in Grand Bassa were passing the WAEC exam at a higher rate than either private or mission schools: 86%, compared to 56% in private and 78% in religious schools; Bong students at public high schools did similarly well. In Lofa and Nimba Counties, public school students performed better on the WAEC exam than private school students, but mission school students outperformed students attending both government and private schools. In figure 12, it is visible that by 2012, the passing rates in government schools of many counties had reached or surpassed those of private and mission schools, and that students' average passing rate in the WAEC exam was improved almost everywhere.

Table 10. WAEC 12th grade exam: average passing percentage by government, private, and religious schools in each county 2010

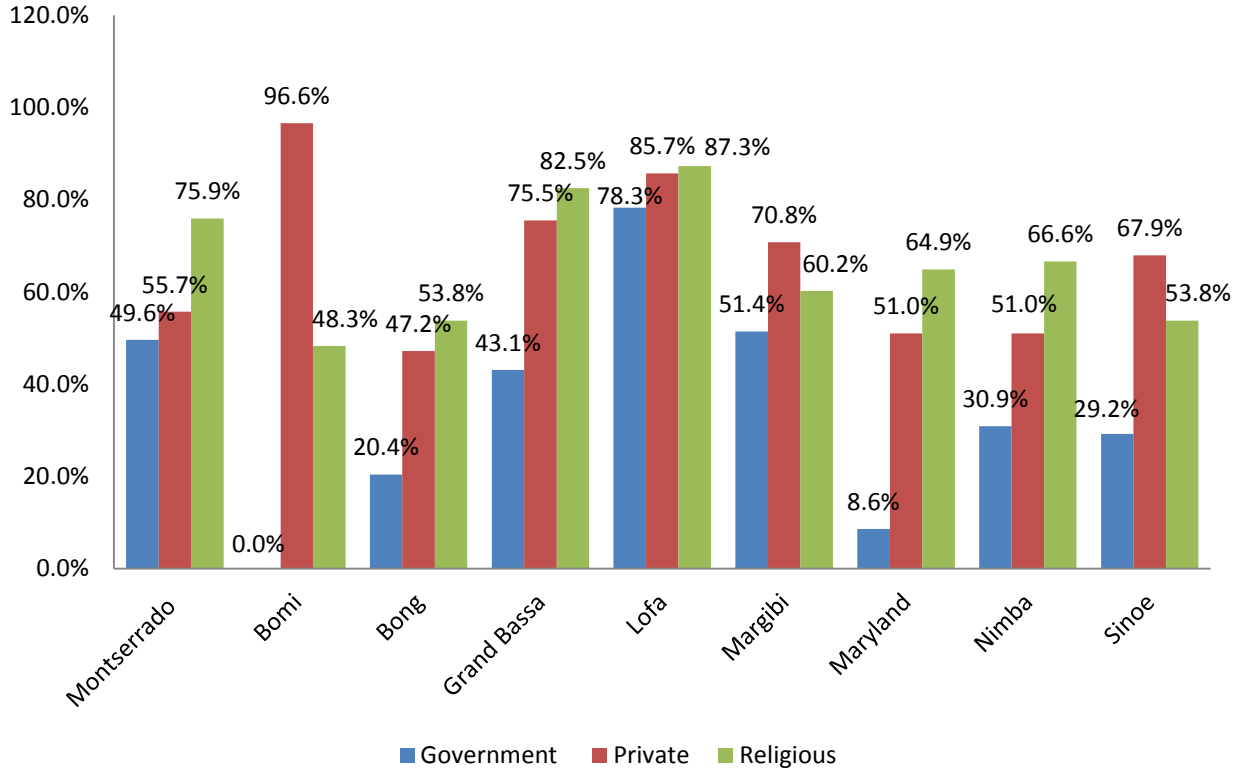


Table 11. WAEC 12th grade exam: average passing percentage by government, private, and religious schools in each county 2011

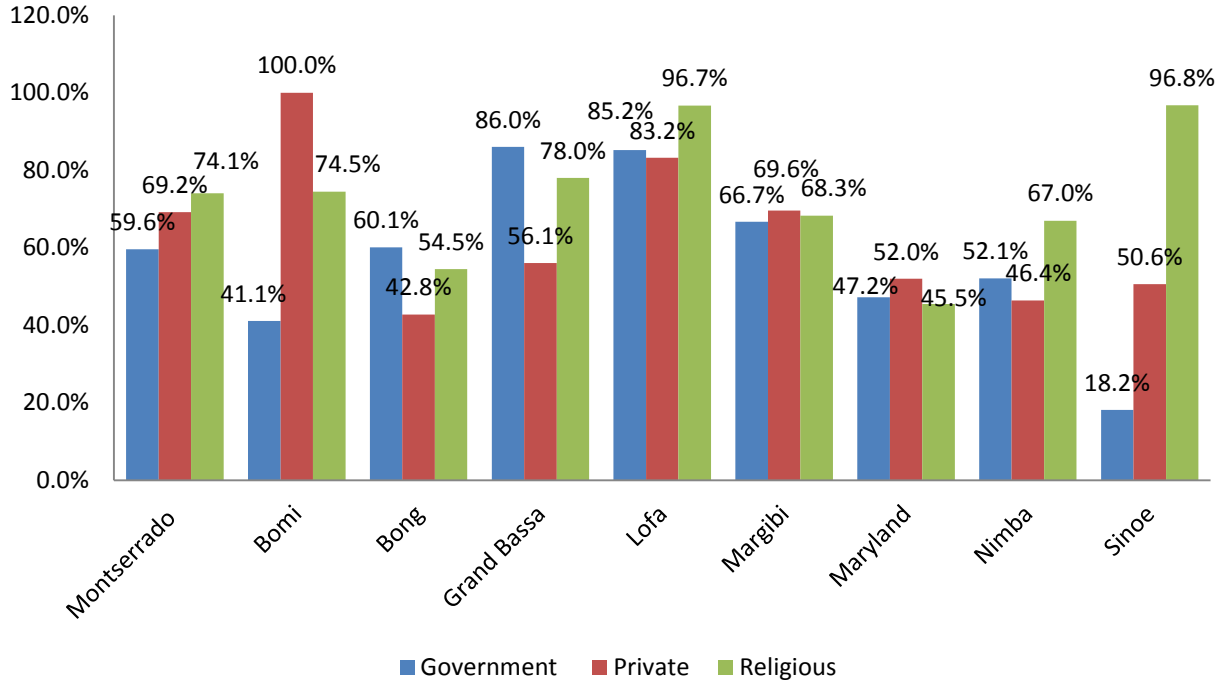
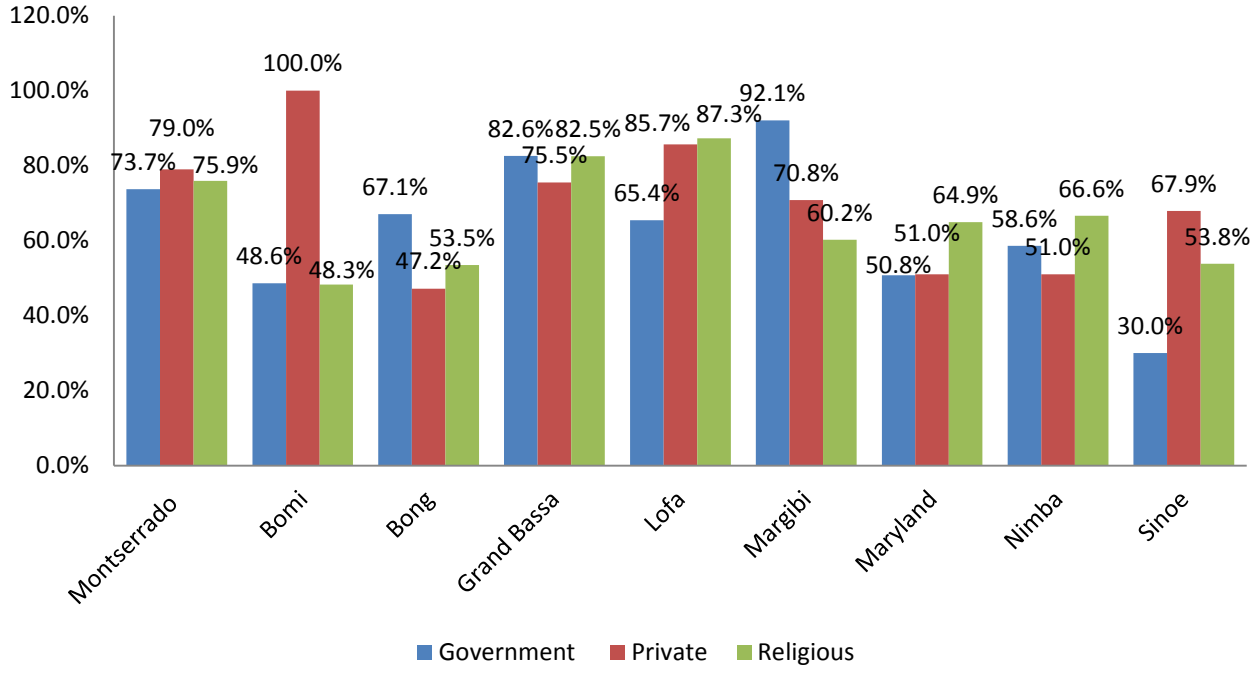


Table 12. WAEC 12th grade exam: average passing percentage by government, private, and religious schools in each county 2012



Overall, the passing rates have been stronger in private and religious schools, but that seems to be closing with government schools rapidly catching up. These results may highlight correlation not causation since the families' higher average socioeconomic status (as observed in the previous section), rather than formal education, may be one driver of better results in private and religious schools. Yet explaining the closing of the gap is harder to do. Certainly, we observe a slight leveling of the playing field in the previous sections, with more rich urban youth attending government schools and more middle class rural youth attending private schools over this period. In addition, Liberia has seen socioeconomic improvement, from improved purchasing power for things like textbooks and electricity, as well as improved infrastructure and lighting, which could improve the ability of students to learn regardless of where they are studying. As our earlier results from the school census point out, there is a crowding in senior high schools (more students to trained teachers across all types of schools) that is inconsistent with a huge increase in the quality of education being provided. So this rapid improvement remains enigmatic and could be explored further.

6. Cost per Student Educated in Government versus Private Schools

To calculate the cost per student educated in government schools, we used the national budget and the Ministry of Education census report 2010-11. The cost per student is calculated as the total budget allocated to primary and secondary education divided by the total number of students enrolled in government schools. The results show that it takes on average about L$1136 or US$16 to educate one student in government primary school and L$8050 or US$112 to educate one student in government secondary school per year.[9]

To get a sense of costs of providing private education, we spoke with non-profit providers in mission school systems. Our interviews with professionals from these schools suggest that the average cost per student educated in primary and secondary schools range from L$1000-L$5000 (US$14-US$69) and L$6000-L$10,000 (US$83-US$139) respectively. (These schools reported getting marginal funding from donors or the Liberian government to fund the school system but not individual schools, which are basically run from tuition and fees.) Also, it is important to note that the cost of educating a student varies by location. It is more expensive to educate a

[9] We used US$1: L$72 as the exchange rate.

student in Monrovia than a student in Lofa or River Gee. We did not research private school tuition rates, which would also need to provide a financial return to their owners on top of the cost of education.

Thus, anecdotally the cost of educating a student in government schools currently falls in the lower range of educating a student in a primary mission school and in the higher range of educating a student in a secondary mission school. More research would be needed to determine which type of school is currently the most cost-effective, but on the surface it appears that they are not that far off—and this is in a market without vouchers, where the market size for private and mission schools remains limited.

7. Current Public Policy in Liberia toward Private/Mission Schools

The current government policy mostly ignores private and mission schools. The Ministry of Education provides minor government subsidies each year, which help private and mission schools cover overhead costs as well as (according to the Ministry) maintain a tuition ceiling in order for parents to be able to afford the tuition. These subsidies amounted US$186,721 in 2009-2010, US$317,000 in 2010-2011, and US$312,000 in 2011-2012—or 0.8%, 1%, and 0.8% of the total educational budget for each year. Almost all government resources and foreign aid resources are directed to public education. Anecdotal evidences from interviews with private/mission school systems indicated that although government subsidies are helpful, the effect of new government policies towards teachers and students may be working in the opposite direction. Higher government salaries for teachers make it harder for private/mission schools to compete for quality teachers. Also, hot lunches provided at government schools (through the assistance of international development partners) give government schools an edge in the competition for students. While these actions by the government may very likely lead to better educational outcomes, they do have the unintended consequence of introducing distortions to the existing market for education. There may be opportunity for a clear-eyed policy that would aim to raise overall education in Liberia by harnessing the advantages of established private and mission schools to create positive pressures on all schools, rather than the current policies which, if anything, unintentionally sideline non-governmental providers.

8. Conclusion

Liberia's history of conflict, limited state capacity, and poverty has not bequeathed a strong education sector. This paper explores whether Liberia's rich history with private and mission schools presents an opportunity today to improve the educational outcomes of students across both public and private schools. Using household survey data, Ministry of Education census reports, West African Examination Council exam scores, and qualitative interviews, we establish a number of stylized facts. Richer, more urban students attend private and religious schools, but these schools are nonetheless accessed by most income quintiles. Public education is doing a good job of reaching students, particularly poor students in rural areas. WAEC test results have been stronger in private and religious schools, but the gap appears to be closing rapidly. Although government subsidies help private and mission schools to cover overhead costs, rising teacher salaries and hot school lunch programs at government schools make it difficult for private and mission schools to compete for teachers and students. These policies may be leading to distortions in the market for education.

Given the current state of Liberia's educational system, the potential upside from healthy competition between public and private schools through a voucher system may be significant. Although the data indicate that many families already choose where to send their children to school, a voucher system would make this choice more accessible to poorer Liberians, while improving the public education system for all. In Liberia, the benefits to cultivating private efforts to improve education may be even larger due to the fact that private education is well established, and completely decentralized. Moreover, the fact that Liberia is rebuilding its state and still acquiring capacity suggests that the benefits of outsourcing some of its effort to the private sector may be outsized. In addition, the government is still facing so-called ghost worker problems and corruption in public education. We recommend that the GoL or another party capable of funding a multi-year experiment consider undertaking a pilot voucher project in a county in which we observe a number of private/mission schools so as to precisely measure the impact on school effectiveness and individual student performance and estimate the cost effectiveness of vouchers.

References

Angrist, J., Bettinger, E., and Kremer, M. 2006. "Long-Term Educational Consequences of Secondary School Vouchers: Evidence From Administrative Records In Colombia," *American Economic Review*, v96 (3,Jun), 847-862.

Auguste, S., and Valenzuela, J.P. 2003. Do students benefit from school competition? Evidence from Chile, Mimeo, University of Michigan.

Ball, S. 2003. Class Strategies and the Education Market: the Middle Classes and Social Advantage. RoutledgeFalmer, London.

Belfield, C.R., and Levin, H.M. 2002. "The Effects of Competition between Schools on Educational Outcomes: A Review for the United States," *Review of Educational Research*, Vol. 72, No. 2: 279-341.

Bifulco, R. and Ladd, H. F. 2007. "School choice, racial segregation, and test-score gaps: Evidence from North Carolina's charter school program," *J. Pol. Anal. Manage*. 26: 31–56.

Chaudhury, N., Hammer, J., Kremer, M., Muralidharan, K., and Rogers, H.F. 2006. "Missing in Action: Teacher and Health Worker Absence in Developing Countries," *Journal of Economic Perspectives*, Vol. 20, No. 1:91-116.

Chubb, J., and Moe, T. 1990. Politics, Markets, and America's Schools. Brookings Institute, Washington, DC.

Cullen, J.B., Jacob, B.A., and Levitt, S. 2006. "The Effect of School Choice on Participants: Evidence from Randomized Lotteries," *Econometrica*, Vol. 74, No.5 (September): 1191-1230.

Driscoll, M.E., and Kerchner, C.T. 1999. "The Implications of Social Capital for Schools, Communities, and Cities: Educational Administration as if a Sense of Place Mattered", J. Murphy and K. S. Louis (Eds), *Handbook of Research on Educational Administration*, Second Edition (San Francisco, Jossey-Bass: 3404.

Filmer, D. and Pritchett, H.L. 2001. "Estimating Wealth Effect without Expenditure Data-or Tears: An Application to Educational Enrollments in States of India," *Demography*, Volume38-Number 1, February: 115-132.

Friedman, M. 1955. The Role of Government in Education, in Economics and the Public Interest, ed. by R. A. Solo. Piscataway, NJ: Rutgers University Press.

Fuller, B., Elmore, R., and Orfield, G. 1996. Policy-making in the Dark: Illuminating the

School Choice Debate, in: B.B. Fuller, R. Elmore, and G. Orfield (Eds) *Who Chooses*? *Who Loses*? Teachers College Press, NY: 1-21.

Gallego, F. 2006. Inter-school competition, incentives and outcomes: Evidence from Chile, mimeo Department of Economics, MIT, USA.

Greene, J.P., Peterson, P.E., and Du, J.1999. "Effectiveness of School Choice: The Milwaukee Experiment," *Education and Urban Society*, Vol. 31, No. 2: 190-213.

Graham, E. G., Garrido, L., and Karjanlahti, A.K. 2012. "Liberia: Inclusive Growth Diagnostics," February 4. Available at SSRN: http://ssrn.com/abstract=2305698 or http://dx.doi.org/10.2139/ssrn.2305698.

Hanushek, Eric. 1995. "Interpreting Recent Research on Schooling in Developing Countries," *World Bank Res. Observer* 10:2, pp. 227–46.

Hoxby, C. 2003. School Choice and School Productivity (or Could School Choice be a Tide that Lifts All Boats? In C. Hoxby (ed) *The Economics of School Choice*, Chicago University Press.

Hsieh, C.T. and Urquiloa, M. 2003. When Schools Compete, How do They Compete? An Assessment of Chile's Nationwide School Voucher Program. NBER Working Paper No. 10008, September.

Hoxby, C. 2002c. "School Choice and School Productivity (or Could School Choice Be a Tide That Lifts All Boats?)," Working Paper 8873, National Bureau of Economic Research, Cambridge, MA.

Johannessen, L.O. 2006. "Struggling for Quality in Education in War-Ridden Liberia," *A Review of the Educational Activities of the Salvation Army in Liberia*.

Lara, B., Mizala, A., and Repetto, A. 2011. "The Effectiveness of Private Voucher Education: Evidence from Structural School Switches," *Educational Evaluation and Policy Analysis*, Vol. 33, No.2:119-137.

Levin, H. 2002. "A Comprehensive Framework for Evaluating Educational Vouchers," *Educational Evaluation and Policy Analysis*, 24(3): 159-174.

Liberia Institute of Statistics and Geo-Information Services. 2007: *Core Welfare Indicator Questionnaire*.

Liberia Institute of Statistics and Geo-Information Services. 2010: *Core Welfare Indicator Questionnaire*.

Lindeman, R.H., P.F. Merenda, and R.Z. Gold. 1980. *Introduction to Bivariate and Multivariate Analysis*. New York: Scott, Foresman.

Lanier, R. O. 1961. "The problem of mass education in Liberia," In: *The Journal of Negro Education*, 30(3) 25–260.

McEwan, P.J. and Carnoy, M. 2000. "The Effectiveness and Efficiency of Private Schools in Chile's Voucher System," *Educational Evaluation and Policy Analysis*. Fall 2000, Vol. 22, No.3: 213-239.

Ministry of Educational census reports 2008 to 2009 and 2010 to 2011.

Mizala, A., and Romaguera, P. 2000. "School Performance and Choice: The Chi lean Experience," *The Journal of Human Resources*, Vol. 35, No. 2 (Spring):392-417.

Pritchett, Lant. Forthcoming. *The Rebirth of Education: From Universal Schooling to Universal Learning*. Washington, DC: Center for Global Development.

Rangan, V. K. and Lee, K. 2012. Bridge International Academies: A School in a Box. Harvard Business School, N9-511-064:1-26.

Rouse, C.E. and Barrow, L. 2009. "School vouchers and student achievement: Recent Evidence, remaining questions," *Annual Review of Economics* vol. 1.

Smrekar, C. and Goldring, E. 1999. School Choice in Urban America: Magnet Schools and the Pursuit of Equity. Teachers' College Press, New York.

StataCorp. 1999. *Stata Statistical Software: Release 6.0*. College Station, TX: Stata Corporation.

Tooley, J., and Dixon, P. 2005. Private Education is Good for the Poor: A Study of Private Schools Serving the Poor in Low-Income Countries (Washington, DC: Cato Institution, p.3).

Walberg, H.J., and Bast, J.L. 2003. Education and Capitalism: How Overcoming Our Fear of Markets and Economics can Improve America's Schools. Hoover Institution Press Publication, No. 521.

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