Teacher Pay in Africa: Evidence from 15 Countries

David K. Evans, Fei Yuan, and Deon Filmer†

Abstract

Pay levels for public sector workers—and especially teachers—are a constant source of controversy. In many countries in Sub-Saharan Africa, protests and strikes suggest that pay is low, while simple comparisons to average national income per capita suggest that it is high. This study presents data on teacher earnings from 15 African countries. The results suggest that in several (seven) countries, teachers' monthly earnings are lower than other formal sector workers with comparable levels of education and experience. However, in all of those countries, teachers report working significantly fewer hours than other workers, so that their hourly earnings are higher. Teachers who report fewer hours are no more likely to report holding a second job, although teachers overall are nearly two times more likely to hold a second job than other workers. With higher national incomes, the absolute value of teacher earnings rises, but they fall as a percentage of income per capita. The study explores variation across types of teacher contracts, the association between teacher earnings and student performance, and the association between teacher earnings premia and other aspects of economies.

†The order of author names was randomly assigned using the American Economic Association's author randomization tool.

Keywords: Education; teachers; public sector; teacher earning

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1. Introduction

Determining the right level and structure for public sector salaries is a challenge in all countries. Nowhere is this more salient than among teachers. The last few years have seen unprecedented numbers of teacher strikes across the United States (Blanc, 2019), and salary has been at the center of demands in almost every case. But this is a global phenomenon, with teachers striking in Mexico, Argentina, India, Uganda, and Mozambique.[1] Evidence on the efficacy of raising teacher salaries for boosting student learning outcomes is mixed, with cross-country work showing that countries with higher teacher salaries tend to have higher student learning outcomes but individual country experiences showing little impact of blanket raises in teacher pay (Hanushek, Piopiunik, and Wiederhold, 2019; de Ree et al., 2018). These current events along with recent findings in the literature raise a variety of questions about teacher compensation: How much are teachers paid? How does that compare with pay for other workers? How does teacher pay correlate with other characteristics of teachers' work, such as their working hours and their propensity to have additional employment? How does it correlate with other aspects of the economy? In this paper, we seek to establish a series of descriptive patterns around the levels of teacher earnings and demonstrate where there are regularities (or not) across 15 Sub Saharan African countries.[2]

The challenge in Africa is particularly salient. In order to achieve universal primary and secondary education, Sub-Saharan African countries are predicted to need 17 million additional teachers (UNESCO 2016). The quality of the incoming teachers will significantly affect the educational outcomes of children in African countries, as teacher quality is a critical determinant of students' test scores, non-test score behaviors, and long-term outcomes (Araujo, Carneiro, Cruz-Aguayo, & Schady, 2016; Chetty, Friedman, & Rockoff, 2014; Hanushek & Rivkin, 2010; Jackson, 2012). Furthermore, these teachers will join education systems characterized by poor performance (Bold et al. 2017).

The challenge is compounded by the fact that there is limited documentation of this policy-relevant topic in Sub-Saharan Africa, in part because there are no systematic teacher salary data across African countries. UNESCO occasionally documents teacher salaries in terms of country GDP per capita (e.g., UNESCO 2009),[3] but it does not provide information on relative earnings differentials. Understanding the structure of earnings in countries with similar economic structures may be one input into policymaker discussions about setting salaries.

In this study, we assemble data from representative population or labor force surveys across 15 Sub-Saharan African nations. We characterize the demographics of the teaching

[1] See reporting on Mexico (Mexico News Daily, 2019), Argentina (Reuters, 2019), India (Kumar and Kumar, 2019), Uganda (Ahimbisibwe, 2019), and Mozambique (da Conceição, 2017).

[2] A question that is separate from the level of teacher salaries but equally important is the structure of teacher salaries. A range of recent work explores different teacher and other public sector pay structures in low- and middle-income countries (Barrera-Osorio and Raju, 2017; Cilliers et al., 2018; Gilligan et al. 2019; Leaver et al., forthcoming; Mbiti et al., 2019; Muralidharan and Sundararaman, 2011). Other aspects of teacher pay may also matter, such as the timeliness of payment (Kontagora et al. 2018).

[3] Specifically, these statistics are provided by Pôle de Dakar, the Africa-based office of UNESCO's International Institute for Educational Planning.

workforce, compare earnings from the primary job for teachers to other wage workers of similar age, education, rural/urban sector, and gender. We then explore structural factors that may explain teacher wage differentials.

Our analysis shows that, across countries, teacher earnings rise in absolute terms with GDP per capita but that they fall as a percentage of GDP per capita – i.e., they rise more slowly than GDP per capita. Within countries, we find that in seven out of the 15 countries, teachers' monthly earnings are statistically significantly lower than that of other comparable wage workers. In five countries (Burkina Faso, Côte d'Ivoire, Namibia, Senegal and Zambia) teachers' monthly earnings are statistically significantly higher than comparable workers. But simple earnings comparisons are complicated by adjustments for working hours. In four of the eight countries where teachers' monthly earnings are lower and where teachers report their hours, their hourly wage is higher (albeit not statistically significantly so) than that of other workers. Positive premia tend to be higher for teachers on permanent contracts – who get paid more but work similar hours – than for teachers on fixed-term contracts. Teacher earnings are not more determined by age and education than those of other workers. The fraction of teachers in the workforce has also risen across countries over the last two decades. Contrary to expectations, the teacher wage differential (monthly or hourly) across countries is not associated with GDP per capita, the size of the formal sector, the share of female workers in other wage jobs, the rate of unionization, or female labor force participation. We find a positive association between teacher earnings differentials and student learning outcomes, both using cross-country and within-country data, although we cannot rule out non-causal explanations for this.

This analysis contributes to three literatures. The first examines the role of earnings in attracting quality candidates to the public sector. Ferraz and Finan (2009) document that higher wages for politicians improve political performance in Brazil. In addition, Dal Bó, Finan, and Rossi (2013) find that when salaries increased, more able applicants applied for public-sector jobs. With respect to teachers, combining cross-country data on teacher salary and student performance on international assessments in OECD countries, Dolton et al. (2011) suggest that "the relative wage of teachers is a very good proxy for their average quality." Recently, Hanushek et al. (2019) show that in OECD countries, teacher salary premiums are associated with teacher cognitive skills and student performance. Our results are consistent with these studies and contribute to the literature by adding evidence from African countries.

The second examines the role of teacher pay changes on student learning. When Indonesia substantially increased teacher pay, teachers' job satisfaction rose but student academic achievement did not (de Ree et al., 2018).[4] Several studies examine the effect of providing hardship allowance to teachers working in remote areas in developing countries on student performance, and most of them find little to no effect (Cabrera and Webbink, 2020; Bau and Das, 2020; Pugatch and Schroeder, 2018; da Silva Filho and de Xavier Pinto, 2014); recent work from Peru is an exception (Bobba et al. 2021). By contrast, we find a positive association between teacher earnings premia across countries and student performance. These findings might not be contradictory to each other if we consider the potential mechanisms for how student learning might be affected. Most of the literature on changes in teacher pay measures the short-term effects of such policies, where the primary mechanism

[4] Other studies, such as Iwu et al. (2017) in Nigeria, also show positive associations between teacher pay and job satisfaction.

to improve student learning in the time frame studied is through the effort of teachers in the current system. However, over time, the mechanism associated with wage differentials and student learning is more likely to be through the selection of higher quality candidates into the profession.[5] Bau and Das (2020), which unlike the other studies follows teacher recruitment for a reasonably long period of time—four years—in Pakistan, nevertheless find no adverse selection effects in teacher quality from a reduction in salaries. Even if, in other contexts, there is a shift in quality in the wake of a pay hike, it may take years to hire new teachers and improve the overall quality of the teaching force. Because of this, de Ree et al. (2018) make the argument that since the total stock of teachers turns over slowly, paying current teachers much more in the hopes of slowly achieving a more effective overall body of teachers may not be a cost-effective education investment.

The third explores cross-country differences in teacher salaries and their association with other outcomes. Finan, Olken and Pande (2017) document that low-income countries provide higher wage premiums to public sector employees. Mizala and Ñopo (2016) conduct an analysis of teacher relative pay using data from 13 Latin American countries and find that teachers earn less than "other professionals and technicians" with similar observable characteristics. Our analysis on low- and middle-income countries in Sub-Saharan Africa also finds that earnings premiums are higher in countries with lower incomes, but we also observe substantial variation in teacher earnings premiums given the income level.[6]

The rest of this paper is structured as follows: Section 2 describes the data and our analytical and empirical strategy. Section 3 describes our results. Section 4 concludes.

2. Data, analytical strategy, and empirical strategy

2.1. Data

We draw on several sources of data. Our principal analysis of teachers and their earnings is based on household and labor force surveys conducted in 15 low- and middle-income countries in Sub-Saharan Africa (Table 1).[7] We chose these countries and surveys based on three criteria:

(1) The surveys included detailed information on occupation, working hours, earnings, educational attainment and other basic demographic characteristics of surveyed household members or individuals.

(2) The surveys were conducted no earlier than 2010. If there were multiple surveys available for the same country, we chose the most recent one. This allows us to provide a contemporary characterization of teacher pay across several African

[5] Teacher pay could also affect teacher turnover, as suggested by a survey of teachers in Nigeria (Okafor et al. 2016).

[6] One recent report examines teacher pay across 13 countries in Sub-Saharan Africa and finds that primary school teachers are underpaid by the hour, compared to other professionals, and secondary school teachers are comparably paid. However, the analysis is pooled for the 13 countries, with no indication of country-by-country variation (see Bashir et al. 2018, Figure 4.7).

[7] We use the World Bank 2019-2020 income and regional classifications (World Bank, 2019b).

countries, especially when describing current levels and comparing those to other professions.

(3) The survey data were accessible.

The resulting set of countries includes Côte d'Ivoire, Namibia, Sierra Leone, Tanzania and Zambia with data from national labor force surveys; Burkina Faso, Malawi, Niger, Nigeria and Uganda with data from Living Standards Measurement Surveys (LSMS) with an employment module; and the Democratic Republic of Congo, The Gambia, Ghana, Liberia and Senegal with data from national household surveys with a labor force module. Table 1 provides background information on these surveys: the countries, the source of the survey data and the year in which the survey was conducted.

The focus of our analysis is primary and secondary school teachers. This choice was driven by the fact that teachers in the basic education cycle make up the bulk of the teaching workforce. Additionally, their salaries are often set centrally and typically paid directly out of government expenditure on education, which makes cross-country comparison possible and meaningful. From each of these surveys, we identified primary and secondary teachers using occupation codes listed in interviewer manuals. Most of the surveys used the International Standard Classification of Occupations (ISCO) or a variant form of it. The occupation codes allowed us to differentiate primary and secondary teachers from other educators such as pre-primary teachers, special education teachers, and university lectures and professors. Exceptions are Malawi where the data classifies teachers at all levels in the same group. (Detailed data processing notes can be found in Appendix Table A1.) We retained Malawi in our analysis, but our conclusions are similar if we exclude it. We excluded educators other than primary and secondary teachers from our analytical samples since their jobs and pay determination may be quite different from primary and secondary teachers. Throughout this paper, "teachers" therefore only refers to primary and secondary school teachers.

Table 1 provides details about our samples: the number of teachers, the share of teachers in the formal sector, and the shares of teachers in the overall workforce in each survey. The number of teachers sampled ranges from 119 teachers in Niger to 1,104 teachers in the Democratic Republic of Congo, with 370 teachers on average per country. On average, teachers in these countries represent 2.2% of the overall labor force in each survey.[8] This share is comparable to that in high-income countries like the United States, where primary and secondary teachers make up about 2.2% of the labor force.[9] Across the surveys, African teachers on average constitute 13% of wage employment.[10]

We also include supplementary analysis using data from a student test in grades 2 and 6 and a complementary teacher survey administered in francophone African countries in 2014, the PASEC (PASEC, 2015).[11] We include data from all available countries: Benin, Burkina Faso, Burundi, Cameroon, the Democratic Republic of Congo, Côte d'Ivoire, Niger, Senegal, Chad, and Togo. Finally, we present data on the total numbers of teachers and students

[8] The labor force is defined as people aged between 15 and 64 who worked, looked for a job in the past week, or had a job to return to.
[9] The statistic of 2.2% for the US is derived from the May 2018 National Occupational Employment and Wage Estimates reported by the U.S. Bureau of Labor Statistics. It is the share of all employment that is categorized as having the occupations of "Elementary and Middle School Teachers" or "Secondary School Teachers."
[10] Formal sector employees are people in the labor force who reported they earned a wage or salary in their primary jobs.
[11] PASEC stands for Programme d'analyse des systèmes éducatifs de la Confemen.

from the UNESCO Institute for Statistics (UNESCO, 2020) and data on the labor force across countries from the International Labour Organization (ILO, 2020).

2.2. Analytical strategy

This paper takes an exploratory approach to questions around teacher pay in Sub-Saharan Africa. Rather than establishing a theoretical framework—which has been done for teachers (Crawfurd and Pugatch, 2020) and for public sector workers more broadly (Finan et al., 2017)—we interrogate the data with the aim of establishing a series of stylized facts and exploring where there are empirical regularities across countries (and where there are not). Specifically, we structure our analysis around five main questions that we hope will help to motivate future work on teachers.

Question 1: Who makes up the teaching workforce? This descriptive section explores the demographics of the teaching workforce. We explore various aspects, including gender and age. In some regions of the world, teaching was historically one of the few professions that women could access, although that has changed as other labor market opportunities for women have expanded (Elacqua et al., 2018). The age of the workforce has implications for how quickly one could expect to observe changes over time. We also characterize the proportion of teachers in public versus private schools (since that distribution affects the workings of the teacher labor market) and the distribution of teachers on permanent versus fixed contracts (which also has implications for the incentives of teachers). Finally, we explore the educational attainment of teachers. While additional years of education may or may not affect teaching quality (depending on the quality of that education), it may affect competition across professions.

Question 2: How has the supply of teachers changed over time? Many African countries have dramatically expanded access to education in recent decades (Evans and Mendez Acosta, 2021). This means that the demand for teachers has risen markedly, which has significant implications both for the level of compensation (needing to attract individuals to the teaching profession) and the share of public resources made up by teacher salaries.

Question 3: What do teachers and other workers earn? We summarize teacher earnings and put them into context in terms of different ways teachers and other workers may conceptualize their earnings: monthly versus hourly, as well as relative to how many hours they report working, and their likelihood of having a second job.[12] Teachers are seeking to optimize income and other outcomes throughout their full range of economic activities, not just their teaching job.

Question 4: How are teachers paid relative to other professionals? Teacher pay relative to other professionals has implications for the ability of the teaching profession to attract candidates as well as broader perceptions of the fairness of the pay scale (which could, for example, affect the likelihood of teacher strikes). We do not present a causal model of teacher pay: individuals select into the teaching profession for reasons that are not captured in our data. However, we do control for a range of observable characteristics, as discussed below. Relative teacher pay may also affect teacher satisfaction and turnover within the profession.

[12] Other factors affect whether teachers (and other workers) acquire a second job, including spousal occupation and earnings (Goux et al. 2014). While a full exploration of these factors is beyond what the data we use will permit (as spousal relationships are not always clear), it merits exploration in future work.

While teaching is not a competitive market (since so much of the market is dominated by the public sector), there are competitive elements in that candidates' occupational choice that may in part be determined by relative earnings, along with other factors such as job security.

Question 5: How does teacher pay correlate with student performance and with other aspects of the economy? Disentangling the effect of teacher pay on student performance is difficult, yet the relationship is certainly of interest. Whether teacher pay has positive impacts on student performance, as some associative evidence may suggest (Hanushek et al. 2019), or no impact on student performance, as more causal evidence in at least two settings has demonstrated (Bau and Das, 2020; De Ree et al. 2018), it has implications for the design of teacher pay structures. We provide further associative evidence from multiple data sources. We also examine the relationship between teacher earnings and other aspects of the economy: GDP per capita, female labor force participation, teacher unionization, etc.

We propose that all five of these questions have implications for policy and for future research as scholars identify ways to better identify causal relationships (or the lack thereof) underlying the associations that we report. Furthermore, we propose that a multi-country approach can help researchers and policy makers to avoid the temptation to generalize from just one or two individual country studies.

2.3. Empirical strategy for estimating relative earnings

Most of our results are cross-tabulations of the data presented to give the reader a series of descriptive statistics about the teaching profession across the 15 Sub-Saharan African countries we study. Simply presenting descriptive statistics—stratified by certain characteristics—can shed light on general patterns but may not capture systematic differences associated with occupations. For example, there might be different job requirements for teachers, and observed differentials may pick up the effects of age or experience. Additionally, there may be regional differences; for instance, urban or rural residence might be systematically related to both earnings as well as the probability of being a teacher. Thus, in this analysis, besides providing descriptive statistics of teachers and their compensations, we also conduct a set of multivariate analyses to examine teacher earnings differentials. Specifically, we estimate models that control for basic productivity factors (following Gregory and Borland 1999), as well as other potential confounders—namely gender and urban/rural residence—that might differ systematically between teachers and comparable wage workers.

We use the specification in Equation (1) to run a set of multivariate OLS regressions to estimate earnings differentials that control for observed potentially confounding variables:

$$ln(Earning_i) = \gamma_0 + \gamma_1 Teacher_i + \gamma_2 Post\_secondary_i + \gamma_3 Age_i + \gamma_4 Age_i^2 + \gamma_5 Male_i + \gamma_6 Urban_i + \varepsilon_i \quad (1)$$

where *ln(Earning)* is the log of total reported earnings (monthly or hourly, depending on the specification), *Teacher* is an indicator variable for teachers, *Post-secondary* is an indicator for having post-secondary education, *Age* is the individual's age, *Male* is an indicator for male individuals, and *Urban* is an indicator for urban residents. In order to further ensure that we

are comparing teachers to comparable workers, the regression sample is limited to wage workers with secondary or post-secondary education.[13]

Even though we control for several potentially confounding observed variables, the estimated coefficient may still not represent the isolated impact of being a teacher on earnings, as there may be unobserved factors that affect both earnings and the probability of being teacher. If this is the case, the coefficient on the teacher variable would capture both the actual impact of being a teacher and the impact of these unobserved factors. Therefore, the analysis should be viewed simply as a summary of the observed premium (or deficit) of being a teacher controlling for the variables included in the model.

When calculating total earnings, we combine reported payments in cash as well as payments in kind (if any), such as food and allowances.[14] However, five of the 15 countries in our sample (Côte d'Ivoire, the Democratic Republic of Congo, The Gambia, Namibia and Tanzania) did not explicitly report the existence and value of in-kind payments. It is unclear from the questionnaires whether in these cases in-kind payments are included in the reported values or not.[15] If in-kind payments are included in these cases, our measures of earnings can be interpreted as the total earnings of an employed person from their primary job. We note, however, that teachers who are civil servants receive further benefits that are not likely to be monetized in regular earnings (e.g., retirement benefits; job security) and hence not included in the response to the earnings questions – and these are therefore not included in our analysis.

Indeed, in our data we find that teachers are significantly more likely to report receiving benefits such as paid leave, medical benefits, and a pension than other workers (Table A3). Across our sample, teachers are 31 percentage points more likely to receive paid leave, 9 percentage points more likely to receive medical benefits, and 30 percentage points more likely to have a pension. On average, even teachers on fixed term (as opposed to permanent) contracts are more likely to receive benefits: for example, 49 percent of teachers on fixed term contracts report access to paid leave versus only 38 percent of other wage workers (Table A4).[16] As a result of these other benefits, our earnings differential estimates likely represent an underestimate of the teacher premium.

In our analysis, we separately consider monthly and hourly earnings since hours worked differ systematically between wage workers who are teachers and those who are not. For all but one survey we analyze reported earnings along with the corresponding time unit of the earnings, for example, daily, weekly, monthly, quarterly, or yearly. Using these two indicators,

[13] While this resembles the model of wage determination proposed by Mincer (1974), we employ it here with a descriptive rather than a causal interpretation.

[14] Appendix Table A2 shows the proportion of respondents who reported in-kind payments (median is 16.9%) and – for those who did – how much of their income they reported as such (median is 24%).

[15] This could affect our results if the reported earnings in surveys from those countries did not include in-kind payment, and teachers in those countries were systematically more (or less) likely to receive in-kind payment relative to employees in other professions. Appendix Table A21 reports regression estimates using monthly earnings excluding the in-kind payments for countries that report in-kind payments. The results are consistent with estimates using earnings with in-kind payments in our main analysis.

[16] In separate data on a wider range of benefits but asked only of teachers, we find that teachers – particularly civil servant teachers – across 10 African countries do report receiving a wide range of benefits (Table A5). For example, 54 percent of teachers in Benin (and 90 percent of civil service teachers) report receiving a housing allowance; those numbers are 67 percent (88 percent) in Côte d'Ivoire. The set of benefits vary across countries, but at least 30 percent of civil service teachers report at least three benefits in each of the 10 countries, and in one (Senegal) they report seven benefits.

we first derive implied monthly earnings. For example, if an employee reports her quarterly earnings, then her monthly earnings are calculated as the quarterly earnings divided by three. If daily earnings are reported, we multiply the daily earnings by how many days the person usually works in a week, then multiply that number by four to get monthly earnings. To estimate hourly earnings, we divide the monthly earnings by four times the reported weekly working hours for each worker. When daily working hours are reported, we calculate the weekly working hours by multiplying the number of days worked in a week. The Gambia survey did not report working hours, so we exclude it from any analysis involving hourly earnings. (Detailed data processing notes can be found in Appendix Table A1.)

When reporting earnings and performing the multivariate analysis, we limit the sample to wage employees (i.e., who self-identified as a paid employee) with at least some secondary education to establish a comparable group of professionals to teachers.[17] This is driven by two facts. First, on average only 4.2% of teachers had less than secondary education in the countries in our sample (Table 2). Therefore, we assume that secondary education is the minimum education requirement for being a teacher in most cases and exclude observations with less than that level of education. Second, teachers either in public or private schools are wage workers. The earnings profiles of wage workers could be systematically different from workers in the informal sector. For instance, many workers in the informal sector are seasonal, so their earnings would fluctuate substantially. A large share of workers in the countries in our sample were either self-employed farmers or family helpers who did not report their earnings. Additionally, as a robustness check to allow for outliers we also estimate multivariate models that trim the top and bottom 1 percent of monthly or hourly earnings in each country sample, as well as estimate the models using median (rather than OLS) regression.[18]

To further unpack the earnings differentials for teachers at different education levels, we extended the teacher variable in equation (1) to primary teacher and secondary teacher variables as reflected in equation (2). Again, we fit equation (2) using both OLS and median regressions.

$$ln\,(Earning_i) = \gamma_0 + \gamma_1 T\_Primary_i + \gamma_2 T\_Secondary_i + \gamma_3 Age_i + \gamma_4 Age_i^2 + \gamma_5 Male_i + \gamma_6 Urban_i + \varepsilon_i \quad (2)$$

where *T_Primary* is an indicator for primary school teachers and *T_Secondary* is an indicator for secondary school teachers.

[17] Note that in our analysis of the characteristics of teachers we include teachers with all levels of education, and report results separately by level of education. For comparisons of earnings, we also restrict the sample to wage workers with secondary or more education.

[18] Our main estimates of earning premiums are similar to those for the trimmed sample or those using median regression. Estimates for these models are reported in Appendix Tables A16-A20.

3. Results

3.1. Who are teachers in Africa?

Before turning to the regression results, we first document the demographic characteristics of teachers and other wage workers (Table 2). For this analysis, we define teachers as survey respondents who self-identified as a primary or secondary school teacher and a wage worker—which excludes university faculty, special education teachers and other teachers.[19] A typical teacher in Africa is a 38-year-old male living in an urban area. In absolute terms, teaching is still more likely to be a career for men: on average, three out of five African teachers are male. By way of contrast, three-quarters of teachers are female in the U.S. (NCES, 2018). However, in relative terms, women in the countries in our study are more represented in teaching than in other wage jobs where male workers make up an even larger share (73%); these findings are consistent with the pattern in high-income countries like the U.S (U.S. Bureau of Labor Statistics, 2021). Indeed, although we observe a lower share of male teachers in the teaching force as national income levels rise across our sample (corr = -0.58, p-value < 0.05, N = 15), the gender difference between teaching and other wage jobs persists across income levels. For example, in Namibia, the country with the highest GDP per capita in our sample, 35% of teachers versus 58% of other wage workers are male. In Malawi, one of the low-income countries, while the share of male workers is 60% in teaching, the share is 80% in other wage jobs.

The average age of teachers in our study countries ranges from 35 (in Burkina Faso, The Gambia, Ghana and Zambia) to 45 (in Liberia), with an average of 38. Teachers are about two years older than other wage workers.[20] About 60% of African teachers live in urban areas, which is also where most wage workers are located. Considering that 59% of the population of Sub-Saharan Africa lives in rural areas,[21] the concentration of teachers in urban areas demonstrates a potential mismatch, consistent with findings from previous research (Bashir et al. 2018; UNESCO, 2019).[22]

In terms of school type, about 20% of teachers work in private schools in these countries.[23] This is consistent with the rise of private schools in Sub-Saharan Africa in recent years (World Bank, 2018). But there is significant variation among the countries we study, with private school teachers ranging from 5% (in Namibia) to 38% (in The Gambia) of the teaching force. Depending on the nature of a private school (e.g., elite or low-cost) and the

[19] Note that we include these neither in the group of teachers nor in the "other wage workers" group.
[20] We present more detail on the age distribution of teachers in Appendix Table A6. Some countries, like Burkina Faso, have relatively low variation in teacher age; others, like DR Congo, have higher variation. The cross-country average of the 25th percentile in teacher age is 31 years old, and the average 75th percentile in teacher age is 45 years old.
[21] Data from World Development Indicators (World Bank, 2021).
[22] The surveys only collected the area an individual lived but not necessarily where the person worked, which would be the ideal way to distinguish whether teachers both lived and worked in urban areas or lived in urban areas but traveled to work in rural areas. The latter is not uncommon in many African countries, which means that our data are not ideal for analyzing urban-rural differences in teacher labor markets. Furthermore, many countries have centralized allocation of teachers rather than local hiring.
[23] Teachers were considered working in private schools unless they reported government (at any level) or any public entity as their employer.

contract type, teachers' salary and benefits could vary substantially, which we discuss in section 3.3.

Another important group in the African teaching force is contract teachers. Due to the increasing demand for education, hiring contract teachers is common in Sub-Saharan African countries—as it is in other parts of the world (Chudgar, 2015).[24] Although their job responsibilities are similar to those of civil-service teachers, contract teachers' salaries are typically substantially lower and these teachers lack job security. In the survey data we use for most countries, all employed respondents—including teachers—are asked whether they have a permanent or a fixed-term/temporary contract. The share of teachers on fixed term or temporary contracts ranges from 5% (Tanzania) to 42% (Côte d'Ivoire) (Table 2). On average, the share of teachers on a fixed term or temporary contract is slightly higher for secondary teachers (25%) than for primary teachers (23%). In Uganda, the share of teachers on a fixed term or temporary contract at the secondary level (74%) is substantially higher than that at the primary level (33%).[25]

Table 3 presents the educational attainment of teachers. The majority of teachers have at least secondary school education in all countries in our sample. The only countries where more than 7 percent of teachers have only a primary degree are Côte d'Ivoire (13.5%) and Zambia (15.8%). Overall, 53% of teachers have post-secondary education. Relative to other wage workers, teachers are much more likely to have post-secondary education in every country except the Democratic Republic of Congo. There is a notable difference in educational attainment between primary school teachers and secondary school teachers in most of the countries. On average, 80% of secondary school teachers have post-secondary education compared to 50% among primary school teachers. The difference is less salient in Côte d'Ivoire, Nigeria, and Uganda, where at least 80% of both primary and secondary teachers have post-secondary education.

3.2. How has the supply of teachers changed over time?

Any discussion of teacher earnings makes more sense if we understand the relative supply of workers in the field (which is, in turn, endogenous to teacher earnings). We track the proportion of primary school teachers relative to the overall labor force along with the ratio of primary school teachers to students across the countries in our sample (Figure 1).[26] There are no countries in which the fraction of teachers in the labor force has fallen substantively. The proportion has risen sharply in several countries (e.g., Burkina Faso, Democratic Republic of Congo, Sierra Leone, Tanzania, and Zambia), risen modestly in some (e.g., Côte d'Ivoire and Malawi), and stayed roughly constant in others (e.g., The Gambia). Furthermore, the teacher-student ratio has also risen in many countries (i.e., smaller class sizes), so the rise in teachers cannot entirely be explained by rising enrollment. The average rise across the continent suggests a combination of increasing demand for teachers and that teaching is seen as a desirable profession.

[24] Many countries employ part of their teaching force on short-term, untenured contracts. Research in Kenya and India shows higher test scores for students taught by locally hired teachers on annual contracts (Duflo et al. 2015; Muralidharan and Sundararaman 2013), although in Kenya, those gains disappeared when the contracts were administered by government rather than by non-government organizations (Bold et al. 2018).

[25] Beyond the share of teachers working at each level of education, we compare the characteristics of teachers on a permanent contract versus on fixed term or temporary contracts in Appendix Tables A10-A12.

[26] There are far more missing data among secondary school teachers and so those results are not informative.

3.3. What do teachers and other workers earn in Africa?

We assess teachers' earnings relative to other wage workers in two ways. In this section, we compare monthly earnings, hourly earnings, hours worked weekly and the proportion having a second job (Table 4). In the next section, we report the results of multivariate analyses that simultaneously control for age, gender and urban/rural residency. For this comparison of earnings, we restrict the sample to wage workers with secondary education or more.

The median earnings of teachers identified in our study surveys are about $680 per month (measured at the 2011 purchasing power parity (PPP) exchange rate) (Column 1, Table 4). There is, however, very large cross-country variation in these monthly earnings. Teachers make $100 per month in the Democratic Republic of Congo, $220 in Liberia, $400 in Niger, $660 in Ghana, $800 in Tanzania, $1,600 in Zambia, and $2,300 in Namibia.

One often-used way to put these numbers in context is to express teacher earnings in relation to GDP per capita. Column 3 of Table 4 reports that, on average, teachers in the sample earn 300 percent of GDP per capita, again with large variation across countries. Teachers in Burkina Faso and Zambia earn around 500 percent of GDP per capita and, at the other extreme, teachers in Nigeria earn only 90 percent of GDP per capita. In the OECD, teachers earn about 130 percent of GDP per capita (OECD, 2011). Plotting these numbers by countries' GDP per capita (Figure 2), we find suggestive evidence of a negative correlation between teacher monthly earnings as a ratio of GDP per capita and a country's income level. In other words, teachers' earnings rise as national income per capita rises, but at a slower rate than national incomes per capita.[27]

Teachers have higher monthly earnings than other wage workers with similar educational background in ten countries in our sample (Columns 1-4, Table 4). Teachers in all countries in our sample report working significantly fewer hours per week, about 36 hours among teachers compared to 49 hours among other workers (Columns 7-8, Table 4). After scaling monthly earnings by hours worked, the results show that teachers are paid more on an hourly basis than other workers in every country except the Democratic Republic of Congo and Niger. Furthermore, teachers are more likely to have a second job in almost every country, which suggests that teachers may want (or need) to work more to make higher earnings (Table 4, last two columns).[28] However, we do not observe an association between reported hours worked by teachers and the propensity to take a second job (corr = 0.08, p-value = 0.77, N = 14).

Who are these other wage workers? To better understand the relationship between teacher earnings and that of other secondary and post-secondary graduates, we summarize the broad occupations of these other workers and summarize their earnings, separated into those with secondary and those with post-secondary education. We classify occupations using the

[27] While one might be tempted to conclude from this analysis that teachers in lower-income countries are relatively better off than those in higher-income countries, the poor living and working conditions in many low- and lower middle-income countries in our sample (not captured in our earnings data) may mean that even being paid several times the GDP per capita does not mean teachers enjoy the same quality of life as teachers in upper-middle- or high-income countries.

[28] In their second jobs, teachers are mostly likely to work as small farmers, tutors, or vendors (Appendix Table A7, A8). See Appendix Table A9 for earnings of different teacher groups: teacher in public schools; primary school teachers; and secondary school teachers.

International Labor Organization codes from the household surveys (ILO 2012). While there is variation, across our study countries we see that among wage workers with secondary education, only one occupation – managers – earns more than teachers (Table 5A). Among wage workers with post-secondary education, there are just four occupations that earn more than teachers: managers, professionals, technicians, and skilled agricultural workers (Table 5B).[29]

A related question to the level of earnings is whether earnings are more or less explained by observable characteristics for teachers as compared to other occupations. Since teacher salaries are often set centrally according to qualifications and experience, one might expect that they should be more readily explained by these attributes. To explore this we regress monthly earnings on gender, age (and its square), education, and urban status separately for teachers and for other wage workers and compare the R-squared (R^2), a measure of how much variation is captured by these observed characteristics (results are reported in Appendix Table A15). Perhaps surprisingly given the expected link between teacher salary and characteristics, we find that in our study countries teacher earnings are slightly less explained by observed characteristics (R^2 of 0.21) than those of other workers (R^2 of 0.27). Even in Ghana, the country in our sample with the highest R^2 for teachers, less than half of teacher earnings are explained by observed characteristics. These statistics are not consistent with the idea that teacher pay is much more likely to be determined by age and education than other wage occupations in these countries.

If we divide teachers by contract type, we find that, on average, the median monthly earnings of fixed term contract teachers are just 70 percent of the earnings of permanent teachers (Table 6). The ratio ranges from just 36 percent in Burkina Faso to 93 percent in the Democratic Republic of Congo. The range is similar for the ratio of hourly wages, suggesting that teachers on permanent and fixed term contracts report similar working hours (Table 7).

3.4. How are teachers paid relative to other professionals, adjusting for controls?

Table 8 reports the monthly earnings differentials estimated by multivariate regression analyses which control for education, age (and its square), gender, and rural/urban location. We first estimate the model for all teachers using OLS and median regression (Columns 1 and 2 respectively). We then replace the teacher dummy with primary-teacher and secondary-teacher dummies in the OLS regression (Columns 3 and 4). Next, we keep only teachers in public schools and remove all other teachers from the sample (Column 5). Last, we estimate the same model but limit the sample to public sector employees to compare how public school teachers are paid compared to other public sector employees (Column 6). As discussed above, for this multivariate analysis we restrict the sample to workers with secondary education or more.

In five of the 15 countries in the sample (Burkina Faso, Côte d'Ivoire, Namibia, Senegal and Zambia), teachers have a statistically significant monthly earnings premium that averages

[29] We also do this comparison by sector (Tables A13 and A14), using UN sector classification codes (UN 2007). With secondary education, teachers earn more than workers in any sector except mining. With post-secondary education, teachers are much lower: post-secondary workers in agriculture, mining, manufacturing, construction, financial services, health and social services, and public administration all earn more. Only workers in retail and administrative services earn less.

40%. In three of the countries (Ghana, Malawi, and Niger), teachers earn similar amounts to comparable wage workers. In the remaining seven countries, teachers exhibit a statistically significant deficit in earnings relative to comparable wage workers that averages 23%. This basic set of results is robust to whether we use OLS or median regression, although the point estimates vary for some countries (additional median results are reported in Appendix Tables A19 and A20).[30]

Given that most teachers are in primary schools, and that most are in public schools, it is unsurprising that the results are similar when we focus on those subsets of the samples. The results suggest that, in general, when public sector teachers have an earnings premium relative to comparable workers, they also have a premium relative to other public sector employees—although this premium is smaller. In these five countries, therefore, this indicates a "hierarchy" of premiums (with teachers having the higher premium). In countries where public sector teachers have an earnings deficit relative to comparable workers, they also tend to face a deficit relative to other public sector employees (with these magnitudes often being similar).

The results for secondary school teachers are different: in many more cases these teachers are paid similarly to comparable workers. There are four countries (out of 14 for which we can estimate this) where there is a statistically significant earnings deficit for teachers (which averages 36%); two countries where there is a premium for teachers; and in the remaining eight countries there is no statistically significant difference.

With respect to hourly earnings, the patterns are more systematic. Teachers have a statistically significant hourly-earnings premium in seven of the 14 African countries. Hourly-earnings deficits are rare, but nevertheless evident in Nigeria (Table 9). Averaging across all values (positive and negative, statistically significant and non-significant), the hourly wage premium for teachers in these African countries is 26 percent. Recall that in monthly earnings terms these averages were close to zero (which masked substantial heterogeneity). The overall pattern is once again similar when using median regression.

The results are also similar when restricting the analysis to primary school teachers or to public school teachers. Public sector teachers tend to have either no premium or a positive hourly earnings premium when compared to other public sector employees (13 of the 14 countries for which this could be estimated). Only in Tanzania do they have a deficit relative to comparable civil servant employees. Last, the hourly earnings premiums are typically also found for secondary school teachers (i.e., these are now more in line with teachers overall/primary school teachers).

Across contract types, earnings premia are higher (or less negative) for teachers with permanent contracts than for teachers with fixed-term contracts. For both monthly and hourly wages, there are more statistically significant premia for permanent contract teachers than for fixed-term contract teachers (Table 10).

[30] If we include teachers and comparator workers with primary education in the regressions, then the teacher premium rises, which is unsurprising since non-teachers with only a primary school education make less.

3.5. Correlations

In this section, we explore the associations between teacher pay and student performance as well as various broader aspects of the economy and the labor market. None of these associations should be assumed to be causal. Other variables, not observed in this analysis, may affect both teacher pay and other aspects of the economy. However, understanding how teacher pay differs across different types of economies both provides a clearer picture of where we observe higher teacher salaries and yields avenues for further exploration.

3.5.1. Teacher pay and student performance

We examine the cross-country association between teacher earnings premiums and student achievement using two measures: first, the harmonized test scores from the Human Capital Index database, recently developed and then updated by the World Bank (2020); second, the rate of "learning poverty" defined as the share of children who are unable to read and understand a simple text by age 10 (World Bank, 2019a). For more details on these measures and our empirical specification, see Appendix 1. Figures 3 and 4 provide visual evidence of the association between teacher earnings differentials and student performance. Figure 3 shows the cross-country relationship of the teacher monthly earnings differential (relative to comparable workers) and harmonized student test scores—and reveals a positive association between the two. Moreover, we observe a similar positive association in Figure 4 that plots the teacher hourly earnings differentials against student test scores. These associations are statistically significant at conventional levels (Table 11).[31] If we drop Namibia—the country with the highest test scores—from the sample, the association with monthly earnings differentials remains, but not the association with hourly earnings differentials. As Table 11 shows, controlling for GDP per capita makes little difference to the coefficient and no difference to the statistical significance.

When we use the rate of learning poverty as a proxy for student performance, we also find an association (this time negative, consistent with the harmonized test score results) between the teacher earnings differential and the proportion of children living in learning poverty. However, because of incomplete data coverage, only 6 countries are included in the analysis and the results are not statistically significant (Table 11).

In our final examination of the association between student learning and earnings, we use microdata from 10 Francophone African countries which include test scores for students and self-reported monthly salaries of teachers (see Appendix 1 for details).[32] We estimate the model both without and with a set of controls (Table A22 Columns 1-6 and 7-12 respectively). We find strongly statistically significant, positive associations when pooling the data across countries in both specifications. While there is some variation depending on the exact specification used at the country level, on the whole, the microdata are consistent with the notion that better paid teachers are in schools with higher performing students.[33] This

[31] As is visible in Figures 3 and 4, the association is driven by two groups of countries: those with low premia and low test scores and those with higher premia and higher test scores. Within these groups the association is close to zero and not statistically significant, although samples are small.
[32] Note that this is no longer examining the relative pay of teachers—rather the absolute level.
[33] This is the case in Grades 2 and 6 combined, in Grade 2, and in Grade 6 without controls; the coefficient is still positive but no longer statistically significant in Grade 6 with controls. When carrying out the analysis country-by-country, the positive association holds in Grades 2 and 6 in eight countries (six with controls) and is statistically significantly positive in five countries (four with controls). With controls, there are two countries with statistically significant negative associations (Benin and Burundi).

may or may not be the result of a causal relationship: we cannot, for example, rule out that the best teachers are paid more and are sent to schools with better students—although our controls do capture teacher education and experience.

3.5.2. Teacher pay and other aspects of the economy

How do teacher earnings differ as structural aspects of economies differ? We explore the correlations between teacher earnings differentials and key macroeconomic indicators like growth in GDP and GDP per capita; labor market indicators like formal sector size and female labor participation; and political economy factors such as the level of teacher unionization.[34] None of these indicators shows a statistically significant association with either the monthly or the hourly earnings differentials for teachers. We also examine the correlation between teacher earnings premia and teachers as a fraction of the labor force, and the change in teachers as a fraction of the labor force and find no statistically significant relationship. (All these correlations and their statistical significance are reported in Appendix Table A23.) Thus, we see no evidence that teacher wage differentials are more pronounced in richer economies, more formal economies, economies with more women in the labor force, or even with teacher unionization. The lack of association between teacher unionization and teacher wage differentials is consistent with evidence from the United States (Frandsen 2016; Paglayan, 2019).[35]

4. Conclusion

Teacher pay makes up the vast majority of education budgets in many African countries (Ugandan Ministry of Education and Sport and UNESCO 2014; World Bank 2018). In this paper, we present new evidence on teacher earnings across a set of 15 Sub-Saharan African countries. We document key descriptive statistics about the level of teacher earnings and compare this level to earnings for other workers of comparable education and experience in the same economies. Our results may explain part of the contention between those who argue that teachers are paid too little and those who argue that teachers are paid too much (Das, 2017). In several countries in our sample, teachers earn less than comparable workers in terms of their monthly earnings, but they earn more than others per hour. In several countries, the earnings gap between teachers on fixed term and permanent contracts is large. Teachers are much more likely to take a second job than other workers. We also document that teachers receive a wide range of benefits that other workers tend not to receive, so earnings estimates for teachers should be seen as underestimates.

One of our objectives in this research is to identify general lessons across Sub Saharan African countries, some of which share languages and legal structures. But these results highlight the danger of adopting a single narrative about compensation for teachers or other public sector workers. Extrapolating from a single case—whether it is Côte d'Ivoire or Nigeria—is unlikely to be instructive when teacher pay differentials and the structure of teacher pay vary so much from country to country, even on the same continent. Growth in the teaching labor force over time varies widely across countries. Monthly earnings premia

[34] The macroeconomic indicators and labor market indicators are drawn from the World Development Indicators database (World Bank, 2019c). The level of teacher unionization is derived from the survey data used in this paper. A teacher is considered to be a union member if she answered yes to a survey question like "Do you belong to a union?"

[35] Frandsen (2016) does find that increased unionization reduces teacher hours in the United States.

for teachers range from strongly positive (Zambia) to strongly negative (Liberia). Hourly earnings premia likewise vary dramatically, although we do not observe strong negative premia in that case. The variation in earnings across teachers—even restricting only to teachers on permanent contracts—differs greatly, from low variation in Sierra Leone to high variation in Burkina Faso. The most obvious structural candidates to explain some of this variation, like the rate of teacher unionization or the formality of the labor force, are uncorrelated with teacher earnings premia. Ultimately, there is no clear, single narrative on teacher compensation that explains the wide variation in the structure of teacher labor markets.

While teacher earnings differentials appear unrelated to a range of structural factors in the economy, teacher earnings do tend to rise slower than national incomes do. The association (and that is all we observe) between teacher earnings differentials and student learning outcomes—both across and within countries—merits further exploration beyond the short-term impacts of wage changes on the performance of existing teachers, in order to observe how selection effects may change the net impact on student learning.

Much of this paper focuses on national differences, but there are important subnational differences beyond the teacher contract differences we have discussed. Many countries provide earnings allowances to teachers who work in rural schools. Evidence from the Gambia and Zambia suggests that these programs can be effective at reducing teacher shortages (Chelwa et al. 2019; Pugatch and Schroeder 2014). However, the amount affects the impact: research from Malawi suggests that allowances were too small to draw teachers to rural areas (Mwenda and Mgomezulu 2018).

Teacher pay clearly matters: it occupies most of the education budget, it has implications for who selects into the teaching profession, who stays in that profession, and who might be willing to work in difficult-to-staff schools. However, teacher earnings relative to other professionals varies across countries, across types of contracts, and across who one uses as a comparison. Although we observe an association between teacher earnings and student learning outcomes, enough other, better causally identified research casts doubt on that association to suggest that the link is at the very least not simple. Higher wages are a blunt instrument for inviting better candidates to the teaching profession, but other approaches—e.g., seeking to select better candidates via observable characteristics—have limitations in that most observed teacher characteristics explain relatively little of teacher value added in test scores (Hanushek and Rivkin 2006; Cruz-Aguayo et al. 2017). Deepening our understanding of what drives teacher pay and—in turn—what teacher pay affects will be crucial as countries across Africa expand their teaching workforce in the coming years.

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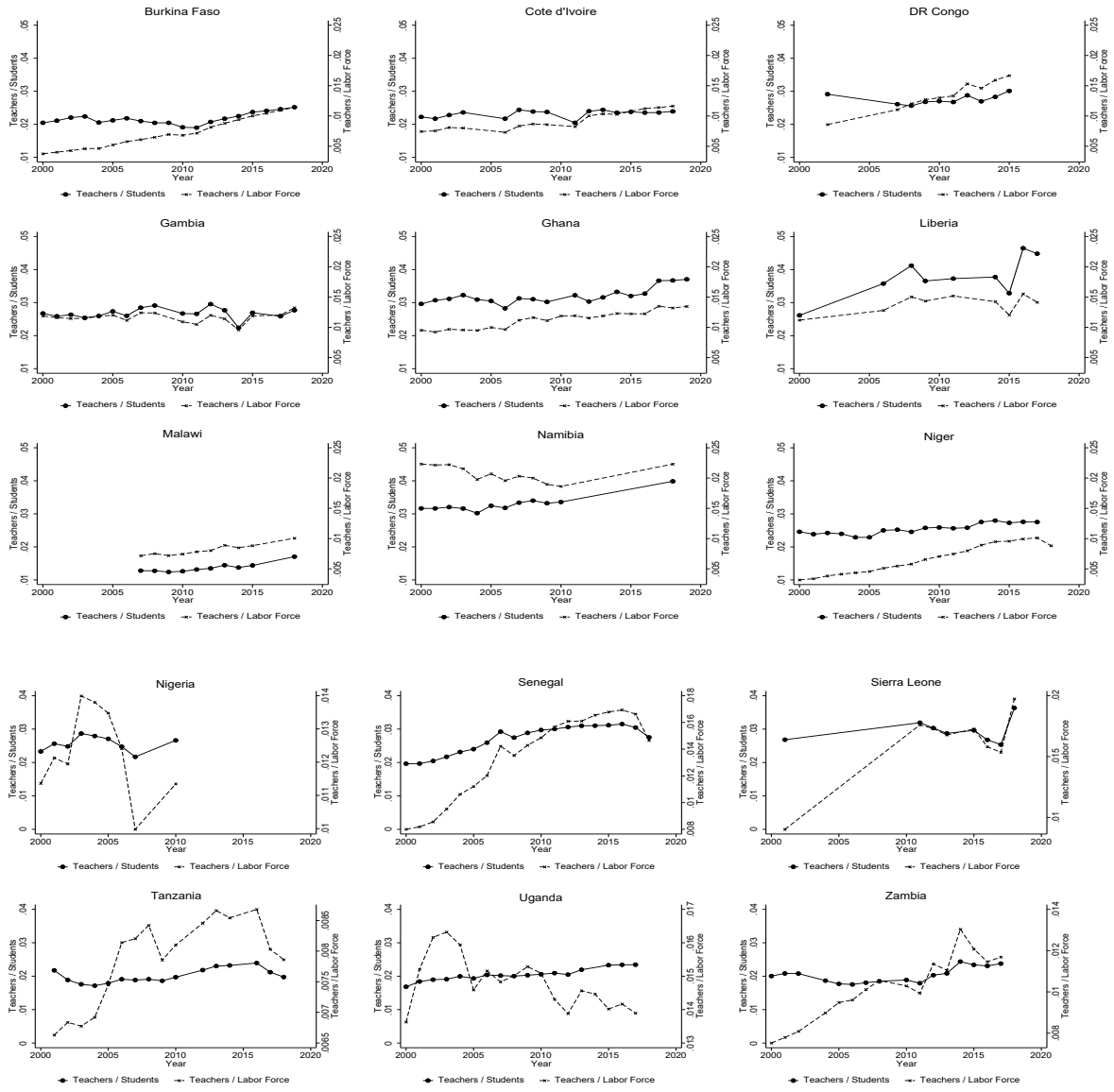
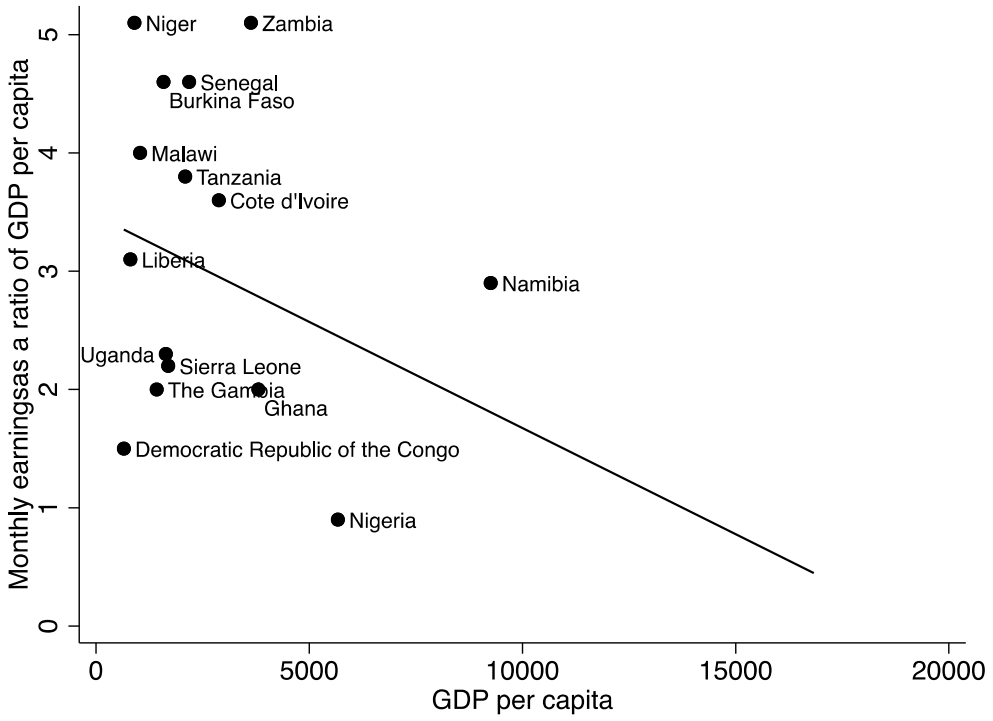
Figures and tables

Figure 1. Trends in Primary School Teachers / Students and in Primary School Teachers / Labor Force



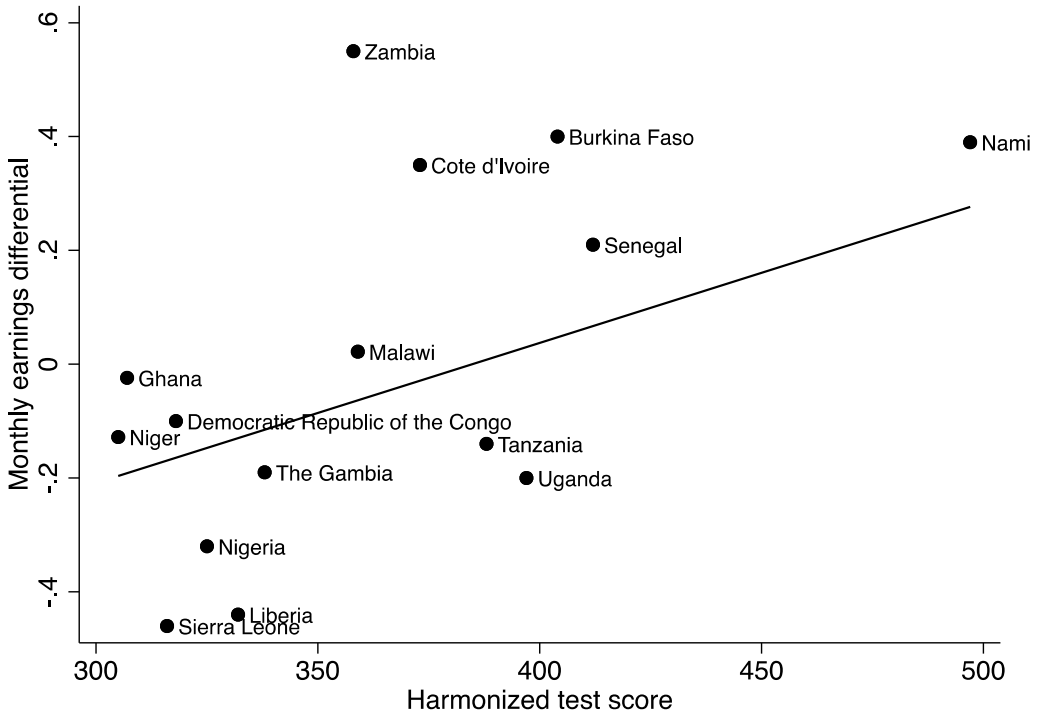
Source: Number of students and number of teachers from UNESCO Institute for Statistics. Labor force is modelled labor force aged 15-64 from International Labor Organization.

Figure 2. Teacher monthly earnings as a ratio of GDP per capita



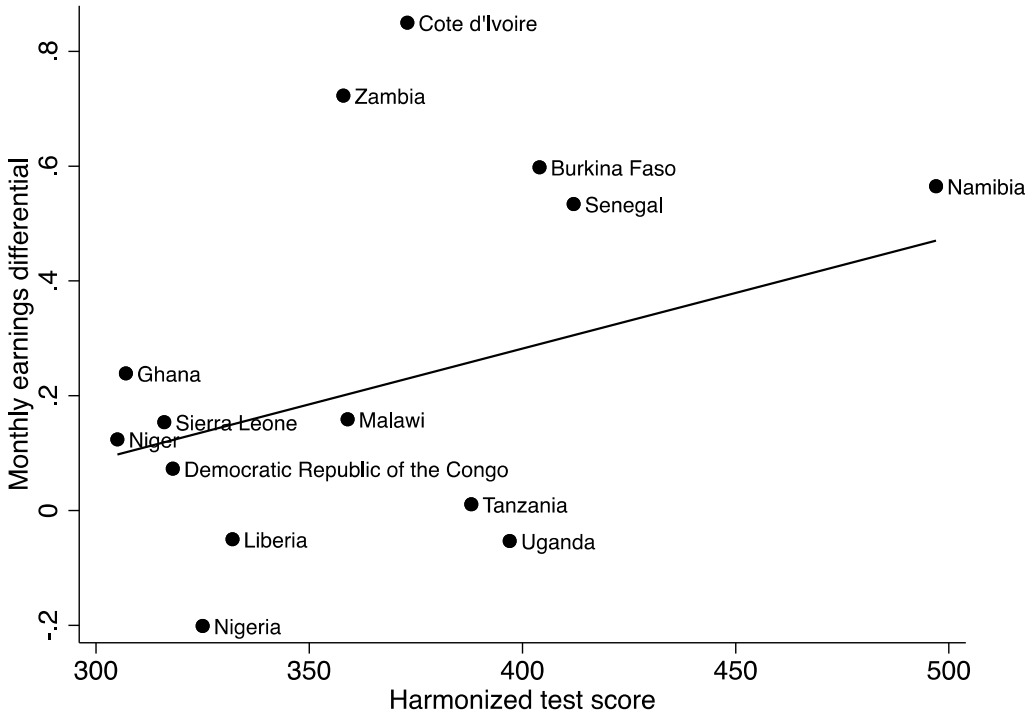
Notes: The solid line is the line of best fit. *Sources*: See Table 1 for survey data sources and year. GDP per capita data are from World Development Indicators (World Bank, 2019c).

Figure 3. Teacher monthly earnings differential and student performance



Notes: The solid line is the line of best fit. *Sources*: See Table 1 for survey data sources and year. Harmonized test scores are from the Human Capital Index dataset (World Bank, 2020).

Figure 4. Teacher hourly earnings differential and student performance



Notes: The solid line is the line of best fit. *Sources*: See Table 1 for survey data sources and year. Harmonized test scores are from the Human Capital Index dataset (World Bank, 2020).

Table 1. Description of analyzed datasets

Country	Source	Year	Teachers		
			Number surveyed	Percent of total surveyed wage workers	Percent of total surveyed work force (ages 15-64)
		(1)	(2)	(3)	(4)
Burkina Faso	Continuous Multisectoral Survey	2014	343	13%	1.3%
Côte d'Ivoire	National Employment Survey	2013	201	6%	1.1%
Democratic Republic of Congo	National Household Survey	2012	1,104	18%	3.1%
The Gambia	Integrated Household Survey	2010	243	10%	1.9%
Ghana	Ghana Living Standards Survey 6	2012-2013	772	16%	2.4%
Liberia	Household Income and Expenditure Survey	2014-2015	171	14%	2.2%
Malawi	Integrated Household Panel Survey	2010	393	12%	1.9%
Namibia	Labor Force Survey	2013	359	8%	3.7%
Niger	National Survey on Household Living Conditions and Agriculture	2014	119	12%	1.6%
Nigeria	General Household Survey	2015	240	20%	2.8%
Senegal	Poverty Monitoring Survey	2010	331	7%	0.8%
Sierra Leone	Labor Force Survey	2014	220	27%	3.1%
Tanzania	Labor Force Survey	2014	396	12%	1.4%
Uganda	Living Standards Measurement Survey	2013	170	15%	2.6%
Zambia	Labor Force Survey	2014	486	10%	2.4%

Source: The surveys were downloaded from the World Bank Microdata Library.

Table 2. Demographic characteristics of teachers in the analytical sample

Country	Teachers					Other wage workers		
	Age	Percent male	Percent urban	Percent working in private schools	Percent on fixed term/ temporary contracts	Age	Percent male	Percent urban
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Burkina Faso	35.1	57.3%	76.6%	20.4%	10.6%	33.0	73.1%	79.6%
Côte d'Ivoire	38.4	79.1%	76.1%	21.0%	41.7%	33.5	75.7%	80.1%
DR Congo	37.5	72.6%	50.6%	15.1%	40.0%	39.7	78.8%	81.2%
The Gambia	35.2	67.5%	67.5%	38.3%	N.A.	33.6	71.7%	79.6%
Ghana	35.0	64.6%	61.4%	17.9%	N.A.	35.9	70.6%	74.7%
Liberia	44.6	85.4%	42.1%	29.4%	N.A.	38.1	80.0%	58.4%
Malawi	38.2	59.5%	41.2%	21.9%	N.A.	34.7	79.2%	47.6%
Namibia	39.6	34.9%	48.7%	4.7%	14.9%	35.9	57.8%	78.2%
Niger	37.1	47.9%	90.6%	18.0%	29.1%	36.2	85.0%	78.2%
Nigeria	40.7	45.4%	45.4%	24.2%	N.A.	39.6	68.1%	54.2%
Senegal	37.1	76.7%	83.4%	9.1%	16.9%	35.6	64.6%	82.0%
Sierra Leone	41.8	63.6%	79.3%	25.5%	16.9%	38.8	69.0%	90.4%
Tanzania	38.6	43.9%	85.4%	19.3%	5.4%	37.5	70.7%	96.3%
Uganda	37.5	60.6%	29.4%	31.2%	40.1%	31.9	71.5%	48.8%
Zambia	35.3	49.6%	60.1%	12.1%	12.6%	33.1	73.1%	69.3%
Average	**38.1**	**60.6%**	**62.5%**	**20.5%**	**22.3%**	**35.8**	**72.6%**	**73.2%**

Notes: Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. Other wage workers include respondents who self-identified as a wage worker in other occupations; university faculty, special education teachers and other teachers were excluded from the group of other wage workers. Teachers were considered working in private schools unless they reported government (at any level) or any public entity as their employer. Surveys in The Gambia, Ghana, Liberia, Malawi, and Nigeria did not report whether a worker was on a permanent or fixed term/temporary contract. Source: Surveys listed in Table 1.

Table 3. Educational attainment of teachers and other wage workers (proportion of workers)

	Teachers			Other wage workers			Primary teachers			Secondary teachers		
Country	P	S	P-S	P	S	P-S	P	S	P-S	P	S	P-S
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Burkina Faso	6.1	73.1	20.8	59.3	31.8	8.9	7.1	82.7	10.2	0.0	12.8	87.2
Côte d'Ivoire	13.5	2.5	84.0	73.5	1.7	24.8	18.7	2.4	78.9	5.2	2.6	92.2
DR Congo	2.5	82.7	14.8	17.0	56.4	26.6	2.6	86.6	10.8	1.8	62.0	36.3
The Gambia	5.8	36.7	57.5	41.5	47.2	11.4	9.8	42.7	47.6	0.0	27.8	72.2
Ghana	0.4	26.0	73.5	22.5	54.5	23.0	0.5	35.8	63.7	0.3	13.0	86.7
Liberia	1.9	76.9	21.2	39.7	49.8	10.5	2.3	85.2	12.5	0.0	39.3	60.7
Malawi	5.1	65.1	29.8	52.9	36.4	10.7		N.A.			N.A.	
Namibia	1.1	30.1	68.8	18.4	68.0	13.6	0.5	39.0	60.5	2.2	15.4	82.4
Niger	4.2	67.2	28.6	61.4	27.8	10.8	5.4	79.6	15.1	0.0	23.1	76.9
Nigeria	1.7	10.8	87.5	18.5	40.1	41.4	1.9	15.5	82.6	1.3	1.3	97.5
Senegal	2.2	48.5	49.4	57.3	33.6	9.2	3.4	75.3	21.4	0.7	15.8	83.6
Sierra Leone	1.8	22.5	75.7	16.6	50.9	32.5	2.3	26.2	71.5	1.1	17.1	81.8
Tanzania	0.3	34.9	64.9	39.6	36.8	23.6	0.4	44.2	55.4	0.0	12.7	87.3
Uganda	0.6	7.2	92.2	54.4	26.3	19.3	0.7	7.9	91.4	0.0	3.9	96.2
Zambia	15.8	64.8	19.4	17.4	68.9	13.6	0.9	30.2	68.9	0.0	23.1	76.9
Average	**4.2**	**43.3**	**52.5**	**39.3**	**42.0**	**18.7**	**4.0**	**46.7**	**49.3**	**0.9**	**19.3**	**79.8**

Notes: P stands for primary school education. S stands for secondary school education. P-S stands for post-secondary school education. The number in each cell represents the proportion of workers with each level of education. Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. Other wage workers include respondents who self-identified as a wage worker in other occupations; university faculty, special education teachers and other teachers were excluded from the group of other wage workers. Primary teachers include respondents who self-identified as a primary school teacher and a wage worker. Secondary teachers include respondents who self-identified as a secondary school teacher and a wage worker. The survey in Malawi did not differentiate the levels of teachers. Source: Surveys listed in Table 1.

Table 4. Average working hours and median earnings of teachers and other wage workers

	Monthly median earnings in PPP ($)		Monthly median earnings relative to GDP per capita		Hourly median earnings in PPP ($)		Hours worked weekly		Proportion of having a second job	
	Teachers	Other workers	Teachers	Other workers	Teachers	Other workers	Teachers	Other workers	Teachers	Other workers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Burkina Faso	650	232	4.8	1.7	4.0	1.3	39.2	52.8	22.3%	25.9%
Côte d'Ivoire	871	339	3.5	1.4	6.6	2.1	31.1	47.0	15.9%	13.2%
DR Congo	100	114	1.6	1.8	0.7	0.7	34.3	45.4	46.9%	22.9%
The Gambia	265	235	2.0	1.8	N.A.		N.A.		N.A.	
Ghana	656	389	2.0	1.2	4.4	2.1	34.3	50.7	26.9%	14.9%
Liberia	220	278	3.1	3.9	1.7	1.5	32.7	51.7	5.8%	3.8%
Malawi	337	257	4.0	3.0	2.6	1.8	33.2	42.0	3.3%	1.2%
Namibia	2,306	633	2.9	0.8	14.7	3.4	39.3	50.5	6.5%	3.3%
Niger	401	533	5.1	6.8	2.8	3.0	34.3	45.4	15.4%	8.9%
Nigeria	460	460	0.9	0.9	2.9	2.8	38.8	46.3	2.1%	1.1%
Senegal	819	647	4.6	3.6	5.6	3.2	35.1	48.4	14.8%	8.7%
Sierra Leone	334	353	2.3	2.4	2.8	1.8	31.3	50.4	21.2%	8.1%
Tanzania	805	773	3.8	3.7	5.0	3.9	42.4	53.2	22.5%	7.6%
Uganda	321	296	2.3	2.1	2.1	1.5	39.5	50.0	47.1%	20.9%
Zambia	1,639	465	5.1	1.5	10.7	2.3	39.2	52.1	10.1%	5.2%
Average	**679**	**400**	**3.2**	**2.4**	**4.4**	**2.1**	**36.1**	**49.0**	**18.6%**	**10.4%**

Notes: All the earnings are in PPP ($,2011). Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. Other wage workers include respondents who self-identified as a wage worker in other occupations; university faculty, special education teachers and other teachers were excluded from the group of other wage workers. Both the teacher sample and other wage worker sample only include workers with secondary or post-secondary education and those who reported both earnings and hours worked weekly. The top and bottom 1% earnings are trimmed. The survey in The Gambia did not report weekly working hours. Source: Surveys listed in Table 1.

Table 5A Monthly median earnings for workers with secondary education by occupation group

Country	Teachers	Other wage workers with secondary school education								
		Managers	Professionals	Technicians	Clerks	Services and sales workers	Skilled agricultural workers	Craft workers	Machine operators	Elementary occupations
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Burkina Faso	603	*603*	*777*	464	441	200	*172*	181	-	-
Côte d'Ivoire	975	*498*	*699*	*847*	*841*	309	-	*407*	*424*	*212*
DR Congo	96	100	91	91	102	109	91	154	182	112
The Gambia	254	400	265	273	235	204	255	204	204	153
Ghana	278	556	389	367	333	222	194	339	333	233
Liberia	207	431	237	279	306	222	278	296	301	176
Malawi	258	544	243	-	254	147	176	235	235	180
Namibia	1,447	1,537	1,265	1,009	723	362	330	542	814	362
Niger	338	*889*	*267*	*886*	544	336	273	367	-	-
Nigeria	230	*402*	259	253	368	172	*92*	460	459	239
Senegal	688	1,034	690	739	647	345	334	371	323	194
Sierra Leone	301	*222*	356	319	323	289	-	278	278	222
Tanzania	724	724	-	757	600	563	*402*	644	584	394
Uganda	188	*494*	*395*	491	*79*	166	*197*	232	286	158
Zambia	1,610	1,073	1,646	1,073	716	304	206	465	465	233
Average	546	634	541	561	434	263	231	345	376	221

Notes: All the earnings are in PPP ($,2011). Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. Other wage workers include respondents who self-identified as a wage worker in other corresponding occupation groups; university faculty, special education teachers and other teachers were excluded from the group of other wage workers. ISCO-08 group definitions are used to classify occupation groups (ILO, 2012). Elementary occupations involve the performance of simple and routine tasks which may require the use of hand-held tools and considerable physical effort. Earnings in *italics* are estimated based on fewer than 10 observations. Sample only includes workers with secondary education. The top and bottom 1% earnings are trimmed. Source: Surveys listed in Table 1.

Table 5B. Monthly median earnings for workers with post-secondary education by occupation group

		Other workers with post-secondary school education								
	Teachers	Managers	Professionals	Technicians	Clerks	Services and sales workers	Skilled agricultural workers	Craft workers	Machine operators	Elementary occupations
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Burkina Faso	756	*1,152*	1,508	928	673	255	*139*	*255*	-	-
Côte d'Ivoire	852	636	627	572	763	297	222	220	475	191
DR Congo	109	136	145	130	182	127	167	170	245	200
The Gambia	286	581	362	408	328	265	-	281	*235*	*174*
Ghana	778	1,111	889	778	686	378	*249*	417	667	428
Liberia	231	648	498	608	*555*	393	*648*	*278*	*200*	*197*
Malawi	330	1,652	751	-	713	520	*419*	419	*384*	*118*
Namibia	2,532	3,978	2,893	2,210	1,266	1,422	*4,069*	1,686	1,655	*814*
Niger	374	*2,133*	1,444	1,304	800	551	*946*	*944*	-	-
Nigeria	483	796	828	598	525	*443*	*667*	828	*345*	374
Senegal	862	1,724	1,293	948	862	733	*1,293*	*754*	*216*	*1,185*
Sierra Leone	350	834	489	501	417	381	*1,669*	445	*620*	*195*
Tanzania	831	1,288	1,288	905	966	857	-	825	*805*	-
Uganda	336	541	494	494	395	355	*197*	415	-	276
Zambia	1,717	1,725	1,789	1,646	1,302	*537*	*1,413*	1,673	1,073	1,285
Average	**722**	**1,262**	**1,020**	**859**	**696**	**501**	**931**	**641**	**577**	**453**

Notes: All the earnings are in PPP ($,2011). Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. Other wage workers include respondents who self-identified as a wage worker in other corresponding occupation groups; university faculty, special education teachers and other teachers were excluded from the group of other wage workers. ISCO-08 group definitions are used to classify occupation groups (ILO, 2012). Elementary occupations involve the performance of simple and routine tasks which may require the use of hand-held tools and considerable physical effort. Earnings in *italics* are estimated based on fewer than 10 observations. Sample only includes workers with post-secondary education. The top and bottom 1% earnings are trimmed. Source: Surveys listed in Table 1.

Table 6. Comparison of teacher monthly earnings by contract type

	Teachers on a permanent contract					Teachers on a fixed term/temporary contract					
	Median	Standard deviation	Inter-quartile	Inter-quartile/ mean	N	Median	Standard deviation	Inter-quartile	Inter-quartile/ mean	N	Ratio of medians
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Burkina Faso	650	733	557	0.88	251	232	464	668	1.4	24	0.36
Côte d'Ivoire	1,059	633	593	0.53	47	371	402	593	1.1	32	0.35
DR Congo	100	60	18	0.18	544	92	56	41	0.4	373	0.93
The Gambia			N.A.					N.A.			
Ghana			N.A.					N.A.			
Liberia			N.A.					N.A.			
Malawi			N.A.					N.A.			
Namibia	2,351	894	1,085	0.48	291	1,537	1029	1,772	1.0	58	0.65
Niger	542	1902	556	0.57	78	334	179	57	0.2	36	0.62
Nigeria			N.A.					N.A.			
Senegal	832	633	388	0.43	224	690	1,301	388	0.4	54	0.83
Sierra Leone	334	6,007	233	0.20	176	278	7,620	342	0.2	21	0.83
Tanzania	805	370	407	0.47	363	713	679	459	0.5	20	0.89
Uganda	345	147	94	0.25	95	252	243	222	0.7	66	0.73
Zambia	1,691	579	465	0.27	411	1,431	820	1,360	1.1	59	0.85
Average	**871**	**1196**	**440**	**0.43**	**248**	**593**	**1279**	**590**	**0.7**	**74**	**0.70**

Notes: Earnings are in PPP ($,2011). Ratio of medians is the ratio of the median earnings for teachers on a fixed term or temporary contract to that for teachers on a permanent contract. Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. All teachers have secondary or secondary or post-secondary education. The top and bottom 1% earnings are trimmed. Surveys in The Gambia, Ghana, Liberia, Malawi, and Nigeria did not report whether a worker was on a permanent or fixed term/temporary contract. Source: Surveys listed in Table 1.

Table 7. Comparison of teacher hourly earnings by contract type

	Teachers on a permanent contract					Teachers on a fixed term/temporary contract					
	Median	Standard deviation	Inter-quartile	Inter-quartile/ mean	N	Median	Standard deviation	Inter-quartile	Inter-quartile/ mean	N	Ratio of medians
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Burkina Faso	4.0	4.9	3.9	0.94	247	1.5	3.8	4.5	1.3	24	0.38
Côte d'Ivoire	7.6	10.0	7.1	0.62	47	4.0	4.4	3.0	0.6	30	0.53
DR Congo	0.7	0.6	0.4	0.44	537	0.7	0.5	0.4	0.6	367	1.00
The Gambia			N.A.					N.A.			
Ghana			N.A.					N.A.			
Liberia			N.A.					N.A.			
Malawi			N.A.					N.A.			
Namibia	14.8	6.4	7.6	0.51	291	9.6	6.4	10.8	1.0	58	0.65
Niger	4.2	14.1	4.6	0.59	78	2.4	2.1	0.7	0.2	36	0.57
Nigeria			N.A.					N.A.			
Senegal	5.9	5.8	5.2	0.67	224	4.5	6.9	3.5	0.6	54	0.76
Sierra Leone	2.6	60.2	2.2	0.13	127	4.0	87.2	4.3	0.1	11	1.51
Tanzania	5.0	2.3	2.7	0.51	363	4.0	2.8	2.7	0.6	20	0.80
Uganda	2.3	3.2	1.3	0.40	92	1.5	1.9	1.6	0.7	62	0.64
Zambia	11.2	4.4	4.5	0.39	411	8.3	5.0	8.5	1.1	59	0.75
Average	**5.8**	**11.2**	**3.9**	**0.48**	**242**	**4.1**	**12.1**	**4.0**	**0.7**	**72**	**0.69**

Notes: Earnings are in PPP ($,2011). Ratio of medians is the ratio of the median earnings for teachers on a fixed term or temporary contract to that for teachers on a permanent contract. Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. All teachers have secondary or secondary or post-secondary education. The top and bottom 1% earnings are trimmed. Surveys in The Gambia, Ghana, Liberia, Malawi, and Nigeria did not report whether a worker was on a permanent or fixed term/temporary contract. Source: Surveys listed in Table 1.

Table 8. Monthly earnings differentials between teachers and other wage workers

	All teachers		Primary teachers	Secondary teachers	Public school teachers	Public school teachers relative to other public sector employees
	OLS	Median			OLS	
	(1)	(2)	(3)	(4)	(5)	(6)
Burkina Faso	0.433***	0.616***	0.447***	0.358	0.495***	0.344***
	(0.104)	(0.090)	(0.111)	(0.238)	(0.113)	(0.132)
Côte d'Ivoire	0.241*	0.317**	0.288	0.192	0.616***	0.112
	(0.131)	(0.129)	(0.175)	(0.177)	(0.156)	(0.156)
DR Congo	-0.121***	-0.099***	-0.113***	-0.159**	-0.135***	-0.084**
	(0.038)	(0.029)	(0.040)	(0.079)	(0.040)	(0.040)
The Gambia	-0.184***	-0.182***	-0.343***	0.049	-0.143**	-0.142*
	(0.056)	(0.050)	(0.069)	(0.081)	(0.069)	(0.077)
Ghana	0.051	-0.004	0.022	0.093	0.128***	-0.076
	(0.045)	(0.045)	(0.055)	(0.063)	(0.050)	(0.056)
Liberia	-0.475***	-0.337***	-0.433***	-0.642***	-0.398***	-0.405***
	(0.084)	(0.083)	(0.092)	(0.172)	(0.098)	(0.105)
Malawi	0.018	0.143**	N.A.		0.075	-0.008
	(0.058)	(0.059)			(0.063)	(0.072)
Namibia	0.381***	0.352***	0.390***	0.365***	0.409***	0.238***
	(0.058)	(0.072)	(0.068)	(0.087)	(0.059)	(0.055)
Niger	-0.156	-0.162*	-0.042	-0.510*	-0.026	-0.275
	(0.140)	(0.092)	(0.157)	(0.262)	(0.154)	(0.200)
Nigeria	-0.250***	-0.276***	-0.297***	-0.166	-0.043	-0.172**
	(0.071)	(0.072)	(0.082)	(0.109)	(0.078)	(0.071)
Senegal	0.247***	0.202***	0.330***	0.132	0.300***	0.155***
	(0.055)	(0.059)	(0.070)	(0.081)	(0.057)	(0.055)
Sierra Leone	-0.586***	-0.286***	-0.660***	-0.480***	-0.541***	-0.517***
	(0.132)	(0.106)	(0.158)	(0.182)	(0.145)	(0.165)
Tanzania	-0.143***	-0.088**	-0.162***	-0.099	-0.139***	-0.245***
	(0.040)	(0.040)	(0.046)	(0.065)	(0.042)	(0.041)
Uganda	-0.188**	-0.301***	-0.240***	0.075	-0.169*	-0.413***
	(0.078)	(0.087)	(0.081)	(0.148)	(0.092)	(0.102)
Zambia	0.522***	0.391***	0.490***	0.608***	0.610***	0.218***
	(0.045)	(0.058)	(0.051)	(0.076)	(0.048)	(0.042)
Average	**-0.014**	**0.019**	**-0.023**	**-0.013**	**0.069**	**-0.085**

Notes: Each column reports the coefficient in the regressions of ln (monthly earnings) on (a dummy for) a type of teachers with controls. The comparison group are other wage workers in columns 1-5 and other public sector employees in column 6. Controls include gender, age, age-squared, urbanicity and (a dummy for) post-secondary education. Sample is restricted to workers with secondary education or more. The survey in Malawi did not differentiate the levels of teachers. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: Surveys listed in Table 1.

Table 9. Hourly earnings differentials between teachers and other wage workers

	All teachers		Primary teachers	Secondary teachers	Public school teachers	Public school teachers relative to other public sector employees
	OLS	Median			OLS	
	(1)	(2)	(3)	(4)	(5)	(6)
Burkina Faso	0.631***	0.763***	0.652***	0.517**	0.696***	0.491***
	(0.107)	(0.093)	(0.114)	(0.245)	(0.117)	(0.134)
Côte d'Ivoire	0.733***	0.792***	0.663***	0.810***	1.045***	0.538***
	(0.143)	(0.140)	(0.188)	(0.196)	(0.169)	(0.178)
DR Congo	0.043	0.107***	0.039	0.063	0.017	0.018
	(0.040)	(0.040)	(0.043)	(0.085)	(0.043)	(0.044)
The Gambia				N.A.		
Ghana	0.324***	0.281***	0.294***	0.364***	0.435***	0.234***
	(0.051)	(0.054)	(0.063)	(0.072)	(0.057)	(0.060)
Liberia	-0.059	0.023	-0.034	-0.158	0.041	0.011
	(0.091)	(0.081)	(0.099)	(0.186)	(0.106)	(0.120)
Malawi	0.169**	0.198***	N.A.		0.225***	0.124
	(0.073)	(0.073)			(0.080)	(0.092)
Namibia	0.563***	0.522***	0.597***	0.502***	0.581***	0.383***
	(0.062)	(0.077)	(0.073)	(0.093)	(0.064)	(0.058)
Niger	0.096	0.061	0.158	-0.098	0.199	-0.089
	(0.145)	(0.100)	(0.163)	(0.271)	(0.159)	(0.205)
Nigeria	-0.146*	-0.180**	-0.206**	-0.020	0.061	-0.058
	(0.086)	(0.079)	(0.099)	(0.131)	(0.095)	(0.088)
Senegal	0.564***	0.571***	0.587***	0.530***	0.620***	0.431***
	(0.059)	(0.063)	(0.075)	(0.087)	(0.061)	(0.058)
Sierra Leone	0.047	-0.035	0.094	-0.037	-0.020	-0.016
	(0.167)	(0.131)	(0.195)	(0.246)	(0.188)	(0.223)
Tanzania	0.003	0.022	-0.010	0.035	0.020	-0.138***
	(0.044)	(0.050)	(0.050)	(0.072)	(0.046)	(0.043)
Uganda	-0.027	-0.142	-0.085	0.260	0.017	-0.138
	(0.095)	(0.101)	(0.100)	(0.180)	(0.111)	(0.144)
Zambia	0.697***	0.524***	0.659***	0.797***	0.785***	0.349***
	(0.050)	(0.063)	(0.056)	(0.084)	(0.053)	(0.045)
Average	**0.260**	**0.251**	**0.262**	**0.274**	**0.337**	**0.153**

Notes: Each column reports the coefficient in the regressions of ln (monthly earnings) on (a dummy for) a type of teachers with controls. The comparison group are other wage workers in columns 1-5 and other public sector employees in column 6. Controls include gender, age, age-squared, urbanicity and (a dummy for) post-secondary education. Sample is restricted to workers with secondary education or more. The survey in Malawi did not differentiate the levels of teachers and the survey in The Gambia did not report weekly earnings. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: Surveys listed in Table 1.

Table 10. Earnings differentials between teachers and other wage workers by contract type

	Monthly		Hourly	
	Permanent	Fixed term /temporary	Permanent	Fixed term /temporary
	(1)	(2)	(3)	(4)
Burkina Faso	0.474***	0.042	0.656***	0.416
	(0.107)	(0.305)	(0.110)	(0.311)
Côte d'Ivoire	0.567***	-0.154	1.009***	0.351*
	(0.161)	(0.190)	(0.173)	(0.208)
DR Congo	-0.061	-0.152***	0.089*	0.020
	(0.045)	(0.054)	(0.048)	(0.058)
The Gambia		N.A.		
Ghana		N.A.		
Liberia		N.A.		
Malawi		N.A.		
Namibia	0.393***	0.279**	0.566***	0.478***
	(0.062)	(0.123)	(0.066)	(0.132)
Niger	-0.098	-0.252	0.157	-0.039
	(0.165)	(0.231)	(0.169)	(0.240)
Nigeria		N.A.		
Senegal	0.234***	0.178	0.568***	0.417***
	(0.059)	(0.114)	(0.063)	(0.122)
Sierra Leone	-0.558***	-0.709**	0.016	0.493
	(0.137)	(0.322)	(0.171)	(0.461)
Tanzania	-0.141***	-0.258*	0.011	-0.210
	(0.041)	(0.152)	(0.045)	(0.168)
Uganda	-0.192**	-0.180*	0.020	-0.100
	(0.097)	(0.104)	(0.118)	(0.123)
Zambia	0.589***	0.036	0.762***	0.179
	(0.048)	(0.109)	(0.053)	(0.122)
Average	**0.121**	**-0.117**	**0.385**	**0.201**

Notes: Each column reports the coefficient in the regressions of ln (monthly/hourly earnings) on (a dummy for) a type of teachers with controls. The comparison group are other wage workers. Controls include gender, age, age-squared, urbanicity and (a dummy for) post-secondary education. Sample is restricted to workers with secondary education or more. Surveys in The Gambia, Ghana, Liberia, Malawi, and Nigeria did not report whether a worker was on a permanent or fixed term/temporary contract. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: Surveys listed in Table 1.

Table 11. Teacher earnings differential and student performance

	Harmonized test score		Learning poverty	
	(1)	(2)	(3)	(4)
Monthly earnings differential	70.73**	72.08**	-0.15	-0.06
	(28.00)	(31.86)	(0.13)	(0.17)
GDP per capita (in thousand)		-0.48		0.05
		(4.53)		(0.05)
Countries	15	15	6	6
Adj. R2	0.33	0.33	0.24	0.42

	Harmonized test score		Learning poverty	
	(1)	(2)	(3)	(4)
Hourly earnings differential	69.67*	67.50*	-0.12	0.002
	(32.55)	(35.66)	(0.11)	(0.17)
GDP per capita (in thousand)		0.95		-0.06
		(4.77)		(0.07)
Countries	14	14	6	6
Adj. R2	0.28	0.28	0.23	0.40

Notes: Each column represents a regression of test scores (harmonized test scores or learning poverty) on earnings differentials. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 Source: Harmonized test scores from Human Capital Index (2020). Learning poverty data from the World Bank (2019a). Earnings differentials from survey data listed in Table 1.

Appendix 1. Teacher earnings and student performance

We use two approaches to explore the association between teacher earnings and student performance—first a cross-country approach building on our estimates, second a within-country approach using PASEC microdata from 10 African countries.[36]

Cross-country

We carry out exploratory cross-country correlational analyses between teacher earnings differentials and other observed variables. Specifically, we examine the association with student achievement using two measures. The first measure of student achievement is the harmonized test scores from the Human Capital Index database, recently developed by the World Bank (2020).[37] This database harmonizes results from international and regional testing programs to make student achievement comparable across nearly 160 countries and economies in the world, and it covers all countries in our sample. The harmonized test scores range from 300 to 600 points and are expressed in the unit of the Trends in International Mathematics and Science Study (TIMSS) testing program. The average score across countries is 431 points, with a standard deviation of 69 points.

Second, we use the rate of "learning poverty" defined as the share of children who are unable to read and understand a simple text by age 10 (World Bank, 2019a). The learning poverty indicator takes into account both the minimum reading proficiency of children in school as well as the proportion of children who are out of school. Compared to the Human Capital Index measure, the learning poverty measure captures a fuller view of student achievement (with its accounting for out-of-school children), but its data coverage is less comprehensive. Among the countries in our sample, only six have learning poverty data.

Within-country

We complement this cross-country analysis with within country analysis of the relationship between teacher reported salaries and student test scores using PASEC microdata from 10 African countries.[38] Specifically, for student *i* with teacher *t* we estimate a model that pools across countries and included fixed effects.

$$Test\ Score_{it} = \alpha + \beta * \ln(Salary)_t + Country_{FE} + \varepsilon_{it} \quad (3)$$

We also estimate a model that includes a vector of controls ($\boldsymbol{X}$) for teacher characteristics: gender, experience and its square, years of schooling, highest education degree obtained, duration of preservice training, whether the teacher is also the principal, and contract status.

(4)

[36] The mean and standard deviation of test scores for each grade level are reported in Table A4.

[37] There are two regional testing programs in Sub-Saharan Africa: the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) organizes the literacy and numeracy assessments of Grade 6 students in most Anglophone Sub-Saharan African countries; and the Analysis Programme of the CONFEMEN Education Systems (PASEC) leads assessments of Grade 6 students in Francophone Sub-Saharan African countries.

[38] The mean and standard deviation of test scores for each grade level are reported in Table A4.

$$Test\ Score_{it} = \alpha + \beta * \ln(Salary)_t + \delta * \boldsymbol{X} + Country_{FE} + \varepsilon_{it}$$

Student and teacher data are collected in Grades 2 and 6 in the study countries. We estimate models that pool the data across grades (and in those models include a dummy variable for being a Grade 6 observation) as well as grade-specific models. Note that salaries are reported in the survey in intervals (e.g., "Between CFAF 15,000 and 29,000" "Between CFAF 30,000 and 59,000" …)—with a total of 13 possible intervals. We assign the value of the midpoint of the reported interval to the teacher as their salary.[39] The estimates derived from this analysis are reported in Table A12.

[39] For the lowest interval "Less than CFAF 14,000" we assign a value of 14,000.

Appendix Tables

Table A1. Data processing notes

Country	Source	Year	Occupation code type	Weekly hours reported	Reported income from main job	Reported secondary job
	(1)	(2)	(3)	(4)	(5)	(6)
Burkina Faso	Continuous Multisectoral Survey	2014	survey-specific, 4 digits	From daily hours and working days in a week	Earnings + period	Yes
Côte d'Ivoire	National Employment Survey	2013	survey-specific , 3 digits	From daily hours and working days in a week	Earnings + period	Yes
DR Congo	National Household Survey	2012	survey-specific , 3 digits	reported	Monthly earnings	Yes
The Gambia	Integrated Household Survey	2010	ISCO codes (4 digits)	Working hours not reported	Earnings + period	No
Ghana	Ghana Living Standards Survey 6	2012-2013	ISCO codes (4 digits)	reported	Earnings + period	Yes
Liberia	Household Income and Expenditure Survey	2014-2015	ISCO 08 code (4 digits)	reported	Earnings + period	Yes
Malawi	Integrated Household Panel Survey	2010	survey-specific major groups, 2 digit group	reported	Earnings + period	Yes
Namibia	Labor Force Survey	2013	ISCO codes (4 digits)	reported	Earnings + period	Yes
Niger	National Survey on Household Living Conditions and Agriculture	2014	survey-specific , 4-digit	reported	Earnings + period	Yes
Nigeria	General Household Survey	2015	ISCO codes (4 digits)	reported	Earnings + period	Yes
Senegal	Poverty Monitoring Survey	2010	survey-specific, 3 digits	reported (but both primary and secondary jobs)	Monthly	Yes
Sierra Leone	Labor Force Survey	2014	ISCO codes (4 digits)	reported	Earnings + period	Yes
Tanzania	Labor Force Survey	2014	country-specific, TASCO (4 digits)	reported	Earnings + period	Yes
Uganda	Living Standards Measurement Survey	2013	ISCO codes , 4 digits	reported	Earnings + period	Yes
Zambia	Labor Force Survey	2014	ISCO codes (4 digits)	From daily hours and working days in a week	Earnings + period	Yes

Table A2. Reports of in-kind payments

Country	Source	Year	In-kind payment	% teachers reported in-kind payment	Share of in-kind payment in teacher earnings	% other workers reported in-kind payment	Share of other workers' in-kind payment in total earnings
		(1)	(2)	(3)	(4)	(5)	(6)
Burkina Faso	Continuous Multisectoral Survey	2014	Yes, benefits and nutrition	0%	-	0.1%	-
Côte d'Ivoire	National Employment Survey	2013	No	N.A.			
DR Congo	National Household Survey	2012	No	N.A.			
The Gambia	Integrated Household Survey	2010	No	N.A.			
Ghana	Ghana Living Standards Survey 6	2012-2013	Yes	1.8%	38.1%	5.8%	37.5%
Liberia	Household Income and Expenditure Survey	2014-2015	Yes, payment in any other form	8.8%	31.7%	24.6%	19.5%
Malawi	Integrated Household Panel Survey	2010	Yes, other allowance	27.4%	26.8%	20.6%	32.7%
Namibia	Labor Force Survey	2013	No, gross income before any deduction	N.A.			
Niger	National Survey on Household Living Conditions and Agriculture	2014	Yes, in-kind + nutrition payment	13.4%	18.6%	17.6%	34.0%
Nigeria	General Household Survey	2015	Yes, in-kind	10.4%	14.0%	17.1%	21.7%
Senegal	Poverty Monitoring Survey	2010	Reported total income including in-kind payment	N.A.			
Sierra Leone	Labor Force Survey	2014	Yes, in-kind + bonus	9.5%	15.3%	40.1%	27.1%
Tanzania	Labor Force Survey	2014	No			-	-
Uganda	Living Standards Measurement Survey	2013	Yes	40.0%	19.8%	35.1%	32.2%
Zambia	Labor Force Survey	2014	Yes	0.0%	-	1.1%	-

Table A3. Proportion of workers receiving employee benefits

	Paid leave		Medical benefits		Social security/Pension	
	Teachers	Other workers	Teachers	Other workers	Teachers	Other workers
	(1)	(2)	(3)	(4)	(5)	(6)
Burkina Faso	0.72	0.27	0.03	0.10	0.79	0.25
Côte d'Ivoire	0.60	0.20	0.33	0.19	N.A.	
DR Congo	0.10	0.10	0.02	0.07	0.04	0.09
The Gambia	0.59	0.38	N.A.		0.64	0.37
Ghana	0.89	0.52	0.24	0.25	0.79	0.32
Liberia	N.A.		0.25	0.25	N.A.	
Malawi			N.A.			
Namibia	0.92	0.80	0.79	0.38	0.74	0.39
Niger	0.77	0.37	0.37	0.22	0.48	0.27
Nigeria	N.A.		0.06	0.18	0.53	0.37
Senegal	N.A.		0.34	0.12	0.61	0.26
Sierra Leone	N.A.		N.A.		N.A.	
Tanzania	0.84	0.48	N.A.		0.95	0.58
Uganda	0.55	0.15	0.05	0.12	0.43	0.13
Zambia	0.92	0.52	0.93	0.58	0.99	0.66
Average	**0.69**	**0.38**	**0.31**	**0.22**	**0.63**	**0.33**

Notes: Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. Other wage workers include respondents who self-identified as a wage worker in other occupations; university faculty, special education teachers and other teachers were excluded from the group of other wage workers. Source: Surveys listed in Table 1.

Table A4. Proportion of teachers receiving employee benefits by contract type

	Paid leave		Medical benefits		Social security/Pension	
	Permanent	Fixed term/ temporary	Permanent	Fixed term/ temporary	Permanent	Fixed term/ temporary
	(1)	(2)	(3)	(4)	(5)	(6)
Burkina Faso	0.84	0.35	0.03	0.06	0.84	0.35
Côte d'Ivoire	0.69	0.45	0.42	0.16	N.A.	
DR Congo	0.13	0.09	0.02	0.01	0.05	0.03
The Gambia			N.A.			
Ghana			N.A.			
Liberia			N.A.			
Malawi			N.A.			
Namibia	0.93	0.87	0.84	0.52	0.80	0.43
Niger	0.81	0.68	0.42	0.24	0.61	0.15
Nigeria			N.A.			
Senegal	N.A.		0.36	0.20	0.65	0.34
Sierra Leone			N.A.			
Tanzania	0.86	0.52	N.A.		0.97	0.67
Uganda	0.73	0.29	0.05	0.06	0.50	0.33
Zambia	0.95	0.68	0.95	0.78	1.00	0.88
Average	**0.74**	**0.49**	**0.39**	**0.25**	**0.68**	**0.40**

Notes: Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. Surveys in The Gambia, Ghana, Liberia, Malawi, and Nigeria did not report whether a worker was on a permanent or fixed term/temporary contract. Source: Surveys listed in Table 1.

Table A5. Proportion of teachers who report receiving "fringe benefits" or "social benefits, allowances and/or bonuses"

Panel A. All grade 2 and grade 6 teachers

	Benin	Burkina Faso	Burundi	Cameroun	Congo Rep.	Côte d'Ivoire	Niger	Senegal	Tchad	Togo
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fringe benefits										
Housing	**0.37**	0.24	**0.47**	0.30	0.14	**0.59**	0.20	0.19	0.22	0.05
Catering	0.01	0.06	0.00	0.04	0.06	0.05	0.02	0.06	0.02	0.01
Access to drinking water	0.17	0.29	0.03	0.16	0.10	0.27	0.17	**0.42**	0.11	0.13
Transport	0.07	0.01	0.22	0.03	**0.39**	0.21	0.12	0.04	0.20	0.02
Social benefits, allowances and/or bonuses										
Health insurance	0.03	0.03	0.11	0.01	0.01	0.11	0.03	0.11	0.01	**0.43**
Mutual health insurance	0.02	0.00	**0.87**	0.00	0.06	**0.53**	0.01	**0.53**	0.01	0.01
Pension or annuity plan	**0.48**	**0.34**	**0.46**	0.31	0.26	**0.59**	0.29	**0.40**	0.13	**0.40**
Housing allowance	**0.54**	**0.41**	**0.80**	0.46	0.00	**0.67**	**0.31**	**0.35**	0.26	0.03
Supervised study allowance	0.06	0.00	0.00	0.02	0.04	**0.38**	0.01	0.04	0.03	0.01
Examination allowance	**0.34**	0.23	0.00	0.23	0.12	0.23	0.10	**0.49**	**0.57**	0.19
Teacher's bonus	**0.45**	0.06	0.28	0.48	0.19	0.02	**0.48**	0.25	0.11	0.27
Back-to-school bonus	**0.66**	0.01	0.01	0.03	0.00	0.00	0.01	0.00	0.01	**0.46**
Assignment grant	0.10	0.03	0.00	0.02	0.12	0.00	0.06	0.05	0.10	0.01
Research allowance	0.01	0.01	0.00	0.48	0.26	0.00	0.01	**0.59**	0.26	**0.38**

Notes: Numbers greater than 0.3 are in bold to improve readability. Source: PASEC 2014.

Panel B. Grade 2 and grade 6 teachers: Civil servants only

	Benin	Burkina Faso	Burundi	Cameroun	Congo Rep.	Côte d'Ivoire	Niger	Senegal	Tchad	Togo
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fringe benefits										
Housing	**0.59**	0.17	**0.46**	**0.39**	0.18	**0.72**	**0.44**	**0.37**	**0.72**	0.04
Catering	0.01	0.00	0.00	0.04	0.00	0.03	0.00	0.01	0.04	0.02
Access to drinking water	0.15	0.25	0.03	0.23	0.07	**0.32**	0.20	0.28	0.23	0.11
Transport	0.10	0.00	0.22	0.00	**0.83**	0.27	**0.32**	0.02	**0.64**	0.04
Social benefits, allowances and/or bonuses										
Health insurance	0.04	0.02	0.11	0.08	0.02	0.14	0.03	0.16	0.01	**0.79**
Mutual health insurance	0.00	0.00	**0.87**	0.00	0.09	**0.70**	0.00	**0.58**	0.00	0.02
Pension or annuity plan	**0.76**	**0.60**	**0.47**	0.65	0.62	**0.77**	**0.57**	**0.80**	**0.38**	0.65
Housing allowance	**0.90**	**0.71**	**0.80**	0.85	0.00	**0.88**	**0.83**	**0.93**	**0.86**	0.03
Supervised study allowance	0.03	0.00	0.00	0.04	0.02	**0.51**	0.02	0.01	0.08	0.02
Examination allowance	**0.50**	**0.43**	0.00	0.53	0.03	0.29	0.08	**0.74**	**0.81**	**0.33**
Teacher's bonus	**0.67**	0.14	0.28	0.89	**0.38**	0.02	**0.69**	**0.60**	**0.36**	**0.50**
Back-to-school bonus	**1.00**	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.02	**0.81**
Assignment grant	0.22	0.01	0.00	0.10	**0.31**	0.00	0.08	0.14	0.32	0.02
Research allowance	0.02	0.00	0.00	0.85	**0.75**	0.00	0.00	**0.84**	**0.86**	**0.63**

Notes: Numbers greater than 0.3 are in bold to improve readability. Source: PASEC 2014.

Table A6. Teacher age distribution

Country	Mean	Standard deviation	25th percentile	Median	75th percentile
	(1)	(2)	(3)	(4)	(5)
Burkina Faso	35.1	7.5	30	34	39
Côte d'Ivoire	38.4	9.4	32	37	44
DR Congo	37.5	11.0	29	36	46
The Gambia	35.2	9.5	28	33	42
Ghana	35.0	10.6	27	32	42
Liberia	44.6	10.9	36	45	53
Malawi	38.2	9.6	31	38	44
Namibia	39.6	10.6	30	41	48
Niger	37.1	9.6	30	36	43
Nigeria	40.7	10.3	32	42	49
Senegal	37.1	8.7	30	35	42
Sierra Leone	41.8	9.3	35	42	49
Tanzania	38.6	10.3	30	36	46
Uganda	37.5	10.1	29	37	45
Zambia	35.3	7.8	30	34	39
Average	**38.1**	**9.7**	**30.6**	**37.2**	**44.7**

Source: Surveys listed in Table 1.

Table A7. Occupations of secondary job for teachers

	Proportion of having a second job	Tutoring/teaching	Farming or animal breeding	Sales/vending	Other
	(1)	(2)	(3)	(4)	(5)
Burkina Faso	22.3%	5%	81%	5%	9%
Côte d'Ivoire	15.9%	12%	47%	22%	19%
DR Congo	46.9%	1%	50%	7%	42%
The Gambia			N.A.		
Ghana	26.9%	3%	73%	8%	16%
Liberia	5.8%	30%	40%	10%	20%
Malawi	3.3%	92%	0%	8%	0%
Namibia	6.5%	9%	32%	9%	50%
Niger	15.4%	6%	56%	11%	27%
Nigeria	2.1%	40%	20%	20%	20%
Senegal	14.8%		N.A.		
Sierra Leone	21.2%	4%	42%	16%	38%
Tanzania	22.5%	3%	74%	16%	7%
Uganda	47.1%	4%	65%	10%	21%
Zambia	10.1%		N.A.		
Average	**18.6%**	**17%**	**48%**	**12%**	**22%**

Notes: Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. The first column reports the proportion of teachers who reported to hold a secondary job. Columns 2 – 5 report the distribution of occupations in the secondary job conditional on having a secondary job. The survey in The Gambia did not report whether a worker held a secondary job. The surveys in Senegal and Zambia did not report the occupation for the secondary job. Source: Surveys listed in Table 1.

Table A8. Occupations of secondary job for teachers by contract type

	Permanent					Fixed-term/Temporary				
	Proportion of having a second job	Tutoring /teaching	Farming or animal breeding	Sales/ vending	Other	Proportion of having a second job	Tutoring/ teaching	Farming or animal breeding	Sales/ vending	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Burkina Faso	21.2%	6%	81%	3%	10%	32.4%	0%	83%	8%	9%
Côte d'Ivoire	16.9%	17%	43%	13%	27%	14.1%	0%	50%	41%	9%
DR Congo	45.4%	1%	49%	6%	44%	50.1%	1%	52%	9%	38%
The Gambia			N.A.					N.A.		
Ghana			N.A.					N.A.		
Liberia			N.A.					N.A.		
Malawi			N.A.					N.A.		
Namibia	6.6%	11%	26%	11%	52%	4.8%	0%	67%	0%	33%
Niger	21.7%	6%	56%	11%	27%	0%	0%	0%	0%	0%
Nigeria			N.A.					N.A.		
Senegal			N.A.					N.A.		
Sierra Leone	13.7%	4%	41%	10%	45%	18.3%	0%	40%	0%	60%
Tanzania	20.9%	4%	76%	10%	10%	25.0%	0%	40%	40%	20%
Uganda	22.7%	2%	71%	8%	19%	19.1%	7%	55%	14%	24%
Zambia	51.0%		N.A.			41.4%		N.A.		
Average	**24.5%**	**6%**	**55%**	**9%**	**29%**	**22.8%**	**1%**	**55%**	**16%**	**28%**

Notes: Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. The first and sixth column reports the proportion of teachers who reported to hold a secondary job. Columns 2 – 5 and 7-10 report the distribution of occupations in the secondary job conditional on having a secondary job. Surveys in The Gambia, Ghana, Liberia, Malawi, and Nigeria did not report whether a worker was on a permanent or fixed term/temporary contract. The surveys in Senegal and Zambia did not report the occupation for the secondary job. Source: Surveys listed in Table 1.

Table A9. Median earnings by teacher type

	Monthly earnings				Hourly earnings			
	Teachers	Public School	Primary	Secondary	Teachers	Public School	Primary	Secondary
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Burkina Faso	650	682	617	773	4.0	4.4	3.9	4.8
Côte d'Ivoire	871	1102	975	733	6.6	7.6	6.9	5.3
DR Congo	100	100	98	102	0.7	0.7	0.7	0.8
The Gambia	265	269	209	327	0.0	-	-	-
Ghana	656	667	500	778	4.4	4.8	3.7	5.6
Liberia	220	220	220	237	1.7	1.8	1.7	1.7
Malawi	337	353	-	-	2.6	3.0	0.0	0.0
Namibia	2,306	2,315	1,989	2,685	14.7	14.7	13.6	16.7
Niger	401	406	360	700	2.8	3.1	2.6	6.7
Nigeria	460	529	402	575	2.9	3.4	2.5	3.6
Senegal	819	819	681	862	5.6	5.9	5.1	7.1
Sierra Leone	334	353	334	362	2.8	2.6	2.8	2.5
Tanzania	805	805	724	934	5.0	5.0	4.5	5.7
Uganda	321	346	321	375	2.1	2.3	2.0	2.8
Zambia	1,639	1,729	1,610	1,807	10.7	11.2	10.2	11.7
Average	**679**	**713**	**646**	**803**	**4.4**	**5.0**	**4.3**	**5.4**

Notes: All the earnings are in PPP ($,2011). Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. Sample only include teachers with secondary or post-secondary education. The top and bottom 1% earnings are trimmed. Source: Surveys listed in Table 1.

Table A10. Demographic characteristics of teachers by contract type

Country	Permanent				Fixed term/temporary			
	Age	Percent male	Percent urban	Percent working in private schools	Age	Percent male	Percent urban	Percent working in private schools
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Burkina Faso	35.2	58.8%	76.9%	17.5%	34.0	48.6%	71.4%	45.7%
Côte d'Ivoire	39.7	78.7%	75.0%	11.1%	36.0	77.6%	77.6%	34.5%
DR Congo	37.9	72.0%	52.4%	12.6%	37.2	73.5%	47.3%	18.4%
The Gambia	-	-	-	-	-	-	-	-
Ghana	-	-	-	-	-	-	-	-
Liberia	-	-	-	-	-	-	-	-
Malawi	-	-	-	-	-	-	-	-
Namibia	40.4	33.9%	48.9%	4.9%	35.3	41.3%	39.7%	4.8%
Niger	39.3	54.1%	88.2%	15.7%	31.5	33.3%	91.7%	23.5%
Nigeria	-	-	-	-	-	-	-	-
Senegal	37.4	78.1%	84.5%	6.5%	35.0	70.4%	77.5%	29.6%
Sierra Leone	42.1	62.8%	79.4%	22.6%	39.8	66.7%	75%	45.8%
Tanzania	39.0	43.5%	85.3%	6.7%	32.5	52.4%	85.7%	4.8%
Uganda	41.3	67.0%	23.0%	1.0%	32.0	51.4%	38.6%	25.7%
Zambia	35.5	49.4%	58.6%	7.6%	34.0	51.6%	68.8%	42.2%
Average	**38.8**	**59.8%**	**67.2%**	**10.6%**	**34.7**	**56.7%**	**67.3%**	**27.5%**

Notes: Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. Teachers were considered working in private schools unless they reported government (at any level) or any public entity as their employer. Source: Surveys listed in Table 1.

Table A11. Educational attainment of teachers by contract type

	Permanent			Fixed term/temporary		
Country	Primary	Secondary	Post-Secondary	Primary	Secondary	Post-Secondary
	(1)	(2)	(3)	(4)	(5)	(6)
Burkina Faso	4.2	74.6	21.2	22.9	60.0	17.1
Côte d'Ivoire	14.1	2.2	83.7	12.9	3.5	83.5
DR Congo	2.3	82.4	15.4	3.3	83.1	13.6
The Gambia				N.A.		
Ghana				N.A.		
Liberia				N.A.		
Malawi				N.A.		
Namibia	1.0	27.7	71.3	1.6	46.0	52.4
Niger	5.9	67.1	27.1	0.0	69.4	30.6
Nigeria				N.A.		
Senegal	2.2	47.4	50.4	5.7	50.0	44.3
Sierra Leone	2.1	22.8	75.1	0.0	16.7	83.3
Tanzania	0.3	35.5	64.2	0.0	23.8	76.2
Uganda	0.0	2.0	98.0	1.5	15.0	83.5
Zambia	0.5	27.3	72.2	1.6	34.4	64.1
Average	**3.3**	**38.9**	**57.9**	**5.5**	**40.2**	**54.9**

Notes: Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. The number in each cell represents the proportion of teachers with each level of education. Surveys in The Gambia, Ghana, Liberia, Malawi, and Nigeria did not report whether a worker was on a permanent or fixed term/temporary contract. Source: Surveys listed in Table 1.

Table A12. Average working hours and median earnings by contract type

	Monthly earnings in PPP ($)		Monthly earnings relative to GDP per capita		Hourly earnings in PPP ($)		Hours worked weekly		Percent of having a second job	
	Permanent	Fixed term/ temporary	Permanent	Fixed term/ temporary	Permanent	Fixed term/ temporary	Permanent	Fixed term/ temporary	Permanent	Fixed term/ temporary
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Burkina Faso	650	232	4.8	1.7	4.0	1.5	39.7	33.8	21.2%	32.4%
Côte d'Ivoire	1,059	371	4.3	1.5	7.6	4.0	31.8	30.3	16.9%	14.1%
DR Congo	100	92	1.6	1.4	0.7	0.7	34.7	33.5	45.4%	50.1%
The Gambia					N.A.					
Ghana					N.A.					
Liberia					N.A.					
Malawi					N.A.					
Namibia	2,351	1,627	2.9	2.0	14.8	9.6	39.3	39.6	6.6%	4.8%
Niger	542	334	6.9	4.2	4.2	2.4	33.9	35.5	21.7%	0%
Nigeria					N.A.					
Senegal	832	690	4.7	3.9	5.9	4.5	34.6	38.5	13.7%	18.3%
Sierra Leone	334	278	2.3	1.9	2.6	4.0	31.7	30.9	20.9%	25.0%
Tanzania	805	713	3.8	3.4	5.0	4.0	42.1	46.9	22.7%	19.1%
Uganda	345	252	2.4	1.8	2.3	1.5	38.1	41.5	51.0%	41.4%
Zambia	1,691	1,431	5.3	4.4	11.2	8.3	39.1	40.4	10.9%	6.3%
Average	**871**	**593**	**3.9**	**2.6**	**5.8**	**4.1**	**36.5**	**37.1**	**23.1%**	**21.2%**

Notes: Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. All the earnings are in PPP ($,2011). The top and bottom 1% earnings are trimmed. Sample only include workers with secondary or post-secondary education and those who reported both earnings and hours worked weekly. Surveys in The Gambia, Ghana, Liberia, Malawi, and Nigeria did not report whether a worker was on a permanent or fixed term/temporary contract. Source: Surveys listed in Table 1.

Table A13. Monthly median earnings for workers with secondary school education by economic activity

Country	Teachers	Other workers with secondary school education								
		Agriculture	Mining	Manufacturing	Construction	Retail	Financial services	Admin services	Health and social services	Public administration
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Burkina Faso	603	*209*	186	232	232	162	*492*	255	278	320
Côte d'Ivoire	975	-	-	*322*	*627*	*237*	-	*477*	*763*	*297*
DR Congo	96	65	363	136	109	114	241	91	82	97
The Gambia	254	204	*210*	179	270	189	408	*194*	240	236
Ghana	278	278	500	228	444	222	278	278	364	667
Liberia	207	255	370	171	278	143	417	222	226	185
Malawi	258	176	*338*	191	206	147	559	287	221	268
Namibia	1,447	334	1,085	506	506	362	1,356	362	687	1,085
Niger	338	273	1,763	267	*383*	240	*389*	*244*	420	540
Nigeria	230	207	*589*	402	460	155	*195*	-	270	352
Senegal	688	431	791	431	388	302	735	-	485	647
Sierra Leone	301	*389*	565	222	556	222	425	334	334	289
Tanzania	724	402	1,073	547	580	560	668	410	672	731
Uganda	188	148	*987*	178	237	158	*99*	*420*	*271*	*346*
Zambia	1,610	215	1,073	394	429	286	1,594	286	1,073	1,252
Average	**546**	**256**	**707**	**294**	**380**	**233**	**561**	**297**	**426**	**487**

Notes: All the earnings are in PPP ($,2011). Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. Other wage workers include respondents who self-identified as a wage worker in other corresponding occupation groups; university faculty, special education teachers and other teachers were excluded from the group of other wage workers. ISIC Rev.4 are used to classify economic activities (UNSD, 2007). Earnings in *italic* are estimated based on fewer than 10 observations. Sample only includes workers with secondary or post-secondary education. The top and bottom 1% earnings are trimmed. Source: Surveys listed in Table 1.

Table A14. Monthly median earnings for workers with post-secondary education by economic activity

		Other workers with post-secondary education								
Country	Teachers	Agriculture	Mining	Manufacturing	Construction	Retail	Financial services	Admin services	Health and social services	Public administration
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Burkina Faso	756	*251*	*1,123*	*394*	*251*	162	200	464	972	603
Côte d'Ivoire	852	203	*1,695*	297	203	318	767	466	583	713
DR Congo	109	172	452	167	608	163	376	330	109	136
The Gambia	286	514	-	459	*214*	255	510	-	373	306
Ghana	778	1,000	1,444	556	722	444	1,067	611	861	889
Liberia	231	895	*2,775*	*740*	*648*	*1,471*	*463*	393	472	*531*
Malawi	330	432	*471*	618	430	662	1,029	735	751	801
Namibia	2,532	1,899	3,436	1,808	1,989	1,627	2,078	1,808	2,351	1,718
Niger	374	*1,511*	*3,111*	*3,511*	*1,422*	*893*	*1,111*	*578*	*1,244*	1,244
Nigeria	483	667	*1,853*	*977*	920	*546*	575	-	737	805
Senegal	862	1,040	981	1,078	862	647	970	-	862	1,121
Sierra Leone	350	*2,948*	*541*	*311*	*222*	*528*	667	434	378	834
Tanzania	831	*895*	*1,207*	1,127	1,288	740	1,368	966	1,046	1,288
Uganda	336	*168*	*987*	*869*	449	*395*	*622*	444	465	464
Zambia	1,717	1,503	2,147	1,073	1,073	1,073	2,111	1,556	1,789	1,700
Average	**722**	**940**	**1,587**	**932**	**753**	**662**	**928**	**732**	**866**	**877**

Notes: All the earnings are in PPP ($,2011). Teachers include survey respondents who self-identified as a primary or secondary school teacher and a wage worker. Other wage workers include respondents who self-identified as a wage worker in other corresponding occupation groups; university faculty, special education teachers and other teachers were excluded from the group of other wage workers. ISIC Rev.4 are used to classify economic activities (UNSD, 2007). Earnings in italic are estimated based on fewer than 10 observations. Sample only includes workers with secondary or post-secondary education. The top and bottom 1% earnings are trimmed. Source: Surveys listed in Table 1.

Table A15. Monthly earnings structure (R-squared)

	Teachers			Other wage workers
	Teacher	Primary teacher	Secondary teacher	
	(1)	(2)	(3)	(4)
Burkina Faso	0.03	0.03	0.06	0.09
Côte d'Ivoire	0.31	0.25	0.37	0.25
DR Congo	0.13	0.12	0.25	0.18
The Gambia	0.18	0.17	0.06	0.23
Ghana	0.42	0.41	0.41	0.26
Liberia	0.16	0.17	0.20	0.16
Malawi	0.25		N.A.	0.37
Namibia	0.26	0.23	0.27	0.26
Niger	0.28	0.23	0.60	0.41
Nigeria	0.30	0.28	0.36	0.36
Senegal	0.09	0.05	0.11	0.35
Sierra Leone	0.14	0.11	0.25	0.11
Tanzania	0.23	0.30	0.19	0.29
Uganda	0.20	0.32	0.10	0.34
Zambia	0.17	0.21	0.16	0.35
Average	**0.21**	**0.21**	**0.25**	**0.27**

Notes: Each cell reports the R-squared of the regression of ln (monthly earnings) on gender, age, age-squared, urbanicity and (a dummy for) post-secondary education for a specified occupation group. Sample includes wage workers with secondary or post-secondary education. The survey in Malawi did not differentiate the levels of teachers. Source: Surveys listed in Table 1.

Table A16. Monthly earnings differentials between teachers and other wage workers (trimmed sample)

	All teachers		Primary teachers	Secondary teachers	Public school teachers	Public school teachers relative to other public sector employees
	OLS	Median			OLS	
	(1)	(2)	(3)	(4)	(5)	(6)
Burkina Faso	0.403***	0.629***	0.418***	0.322	0.472***	0.369***
	(0.093)	(0.088)	(0.099)	(0.211)	(0.100)	(0.121)
Côte d'Ivoire	0.348***	0.441***	0.461***	0.235	0.678***	0.267**
	(0.114)	(0.119)	(0.153)	(0.154)	(0.137)	(0.112)
DR Congo	-0.103***	-0.090***	-0.101***	-0.109	-0.116***	-0.060
	(0.035)	(0.027)	(0.037)	(0.073)	(0.037)	(0.037)
The Gambia	-0.191***	-0.149***	-0.343***	0.033	-0.162***	-0.179***
	(0.044)	(0.050)	(0.054)	(0.063)	(0.053)	(0.056)
Ghana	-0.024	-0.023	-0.038	-0.004	0.045	-0.130***
	(0.040)	(0.045)	(0.049)	(0.057)	(0.045)	(0.047)
Liberia	-0.441***	-0.281***	-0.399***	-0.601***	-0.356***	-0.314***
	(0.069)	(0.080)	(0.075)	(0.139)	(0.080)	(0.075)
Malawi	0.022	0.140**	N.A.		0.101*	-0.036
	(0.050)	(0.057)			(0.055)	(0.057)
Namibia	0.386***	0.359***	0.391***	0.379***	0.415***	0.250***
	(0.052)	(0.071)	(0.061)	(0.078)	(0.053)	(0.048)
Niger	-0.128	-0.168*	-0.046	-0.378**	-0.007	-0.173
	(0.097)	(0.092)	(0.109)	(0.180)	(0.105)	(0.119)
Nigeria	-0.317***	-0.297***	-0.390***	-0.183**	-0.130**	-0.237***
	(0.059)	(0.072)	(0.068)	(0.090)	(0.064)	(0.059)
Senegal	0.206***	0.225***	0.284***	0.095	0.255***	0.102**
	(0.050)	(0.058)	(0.063)	(0.074)	(0.051)	(0.050)
Sierra Leone	-0.464***	-0.201*	-0.482***	-0.436***	-0.363***	-0.351**
	(0.114)	(0.104)	(0.136)	(0.158)	(0.127)	(0.145)
Tanzania	-0.135***	-0.082**	-0.150***	-0.101*	-0.137***	-0.233***
	(0.036)	(0.040)	(0.041)	(0.059)	(0.038)	(0.037)
Uganda	-0.199***	-0.304***	-0.253***	0.063	-0.168**	-0.459***
	(0.072)	(0.084)	(0.075)	(0.135)	(0.085)	(0.082)
Zambia	0.545***	0.416***	0.512***	0.633***	0.635***	0.237***
	(0.043)	(0.059)	(0.048)	(0.072)	(0.045)	(0.041)
Average	**-0.006**	**0.041**	**-0.010**	**-0.004**	**0.077**	**-0.063**

Notes: Each column reports the coefficient in the regressions of ln (monthly earnings) on (a dummy for) a type of teachers with controls. The comparison group are other wage workers in columns 1-5 and other public sector employees in column 6. Controls include gender, age, age-squared, urbanicity and (a dummy for) post-secondary education. The top and bottom 1% earnings are trimmed. The survey in Malawi did not differentiate the levels of teachers. Sample is restricted to workers with secondary education or more. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: Surveys listed in Table 1.

Table A17. Hourly earnings differentials between teachers and other wage workers (trimmed sample)

	All teachers		Primary teachers	Secondary teachers	Public school teachers	Public school teachers relative to other public sector employees
	OLS	Median			OLS	
	(1)	(2)	(3)	(4)	(5)	(6)
Burkina Faso	0.598***	0.764***	0.619***	0.479**	0.670***	0.513***
	(0.095)	(0.093)	(0.101)	(0.217)	(0.103)	(0.123)
Côte d'Ivoire	0.850***	0.840***	0.848***	0.852***	1.109***	0.701***
	(0.125)	(0.135)	(0.166)	(0.171)	(0.150)	(0.139)
DR Congo	0.073**	0.123***	0.062	0.126*	0.047	0.057
	(0.036)	(0.037)	(0.039)	(0.076)	(0.039)	(0.040)
The Gambia				N.A.		
Ghana	0.239***	0.270***	0.217***	0.268***	0.338***	0.166***
	(0.046)	(0.053)	(0.058)	(0.066)	(0.052)	(0.052)
Liberia	-0.050	0.012	-0.032	-0.120	0.049	0.067
	(0.078)	(0.081)	(0.086)	(0.158)	(0.091)	(0.096)
Malawi	0.159**	0.190***	N.A.		0.243***	0.083
	(0.065)	(0.069)			(0.071)	(0.078)
Namibia	0.565***	0.527***	0.594***	0.514***	0.584***	0.396***
	(0.056)	(0.076)	(0.066)	(0.085)	(0.058)	(0.050)
Niger	0.124	0.081	0.154	0.031	0.218*	0.012
	(0.104)	(0.098)	(0.117)	(0.194)	(0.114)	(0.128)
Nigeria	-0.201***	-0.208***	-0.285***	-0.031	-0.001	-0.105
	(0.075)	(0.077)	(0.087)	(0.114)	(0.082)	(0.077)
Senegal	0.534***	0.553***	0.549***	0.513***	0.588***	0.393***
	(0.054)	(0.065)	(0.068)	(0.080)	(0.056)	(0.053)
Sierra Leone	0.154	0.124	0.230	0.012	0.154	0.175
	(0.145)	(0.130)	(0.168)	(0.216)	(0.165)	(0.196)
Tanzania	0.011	0.034	0.002	0.031	0.021	-0.126***
	(0.040)	(0.050)	(0.046)	(0.066)	(0.042)	(0.040)
Uganda	-0.053	-0.176*	-0.119	0.269*	-0.007	-0.253**
	(0.086)	(0.100)	(0.090)	(0.161)	(0.101)	(0.116)
Zambia	0.723***	0.546***	0.685***	0.823***	0.813***	0.369***
	(0.048)	(0.065)	(0.054)	(0.080)	(0.051)	(0.043)
Average	**0.266**	**0.263**	**0.271**	**0.290**	**0.345**	**0.175**

Notes: Each column reports the coefficient in the regressions of ln (monthly earnings) on (a dummy for) a type of teachers with controls. The comparison group are other wage workers in columns 1-5 and other public sector employees in column 6. Controls include gender, age, age-squared, urbanicity and (a dummy for) post-secondary education. The top and bottom 1% earnings are trimmed. The survey in Malawi did not differentiate the levels of teachers and the survey in The Gambia did not report weekly earnings. Sample is restricted to workers with secondary education or more. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: Surveys listed in Table 1.

Table A18. Earnings differentials between teachers and other wage workers by contract type (trimmed sample)

	Monthly		Hourly	
	Permanent	Fixed term /temporary	Permanent	Fixed term /temporary
	(1)	(2)	(3)	(4)
Burkina Faso	0.442***	0.030	0.620***	0.402
	(0.095)	(0.263)	(0.098)	(0.268)
Côte d'Ivoire	0.628***	0.002	1.072***	0.535***
	(0.142)	(0.166)	(0.154)	(0.182)
DR Congo	-0.048	-0.133***	0.113***	0.050
	(0.041)	(0.050)	(0.043)	(0.052)
The Gambia		N.A.		
Ghana		N.A.		
Liberia		N.A.		
Malawi		N.A.		
Namibia	0.389***	0.325***	0.561***	0.510***
	(0.055)	(0.111)	(0.060)	(0.120)
Niger	-0.042	-0.304**	0.191*	-0.087
	(0.091)	(0.128)	(0.099)	(0.141)
Nigeria		N.A.		
Senegal	0.197***	0.136	0.544***	0.384***
	(0.053)	(0.104)	(0.058)	(0.111)
Sierra Leone	-0.471***	-0.686**	0.081	0.534
	(0.119)	(0.287)	(0.151)	(0.414)
Tanzania	-0.138***	-0.158	0.013	-0.103
	(0.037)	(0.140)	(0.041)	(0.158)
Uganda	-0.187**	-0.206**	-0.008	-0.117
	(0.089)	(0.097)	(0.106)	(0.113)
Zambia	0.617***	0.031	0.793***	0.182
	(0.045)	(0.104)	(0.051)	(0.116)
Average	**0.139**	**-0.096**	**0.398**	**0.229**

Notes: Each column reports the coefficient in the regressions of ln (monthly/hourly earnings) on (a dummy for) a type of teachers with controls. The comparison group are other wage workers. Controls include gender, age, age-squared, urbanicity and (a dummy for) post-secondary education. The top and bottom 1% earnings are trimmed. Surveys in The Gambia, Ghana, Liberia, Malawi, and Nigeria did not report whether a worker was on a permanent or fixed term/temporary contract. Sample is restricted to workers with secondary education or more. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: Surveys listed in Table 1.

Table A19. Median regression estimates of monthly earning differentials (trimmed sample)

	All teachers	Primary teachers	Secondary teachers	Public school teachers	Public school teachers relative to other public sector employees
	(1)	(2)	(3)	(4)	(5)
Burkina Faso	0.629***	0.635***	0.449**	0.706***	0.456***
	(0.088)	(0.094)	(0.201)	(0.094)	(0.101)
Côte d'Ivoire	0.441***	0.486***	0.070	0.653***	0.306***
	(0.119)	(0.158)	(0.159)	(0.137)	(0.109)
DR Congo	-0.090***	-0.083***	-0.115**	-0.092***	-0.029*
	(0.027)	(0.029)	(0.057)	(0.028)	(0.017)
The Gambia	-0.149***	-0.304***	0.060	-0.110*	-0.092
	(0.050)	(0.059)	(0.070)	(0.058)	(0.056)
Ghana	-0.023	-0.068	0.053	0.032	-0.142***
	(0.045)	(0.054)	(0.063)	(0.050)	(0.042)
Liberia	-0.281***	-0.238***	-0.425**	-0.154	-0.112
	(0.080)	(0.089)	(0.165)	(0.096)	(0.089)
Malawi	0.140**	-	-	0.228***	0.075
	(0.057)	-	-	(0.063)	(0.054)
Namibia	0.359***	0.354***	0.372***	0.373***	0.256***
	(0.071)	(0.085)	(0.108)	(0.073)	(0.056)
Niger	-0.168*	-0.064	-0.347**	-0.033	-0.160**
	(0.092)	(0.103)	(0.170)	(0.098)	(0.079)
Nigeria	-0.297***	-0.355***	-0.134	-0.068	-0.115
	(0.072)	(0.081)	(0.108)	(0.077)	(0.074)
Senegal	0.225***	0.266***	0.079	0.228***	0.059
	(0.058)	(0.073)	(0.086)	(0.060)	(0.050)
Sierra Leone	-0.201*	-0.203	-0.188	-0.153	-0.166
	(0.104)	(0.128)	(0.150)	(0.113)	(0.107)
Tanzania	-0.082**	-0.105**	-0.037	-0.075*	-0.184***
	(0.040)	(0.046)	(0.066)	(0.042)	(0.043)
Uganda	-0.304***	-0.350***	0.018	-0.270***	-0.505***
	(0.084)	(0.088)	(0.158)	(0.101)	(0.085)
Zambia	0.416***	0.425***	0.412***	0.458***	0.146***
	(0.059)	(0.066)	(0.099)	(0.062)	(0.034)

Notes: Each column reports the coefficient in the median regressions of ln (monthly earnings) on (a dummy for) a type of teachers with controls. The comparison group are other wage workers in columns 1-5 and other public sector employees in column 6. Controls include gender, age, age-squared, urbanicity and (a dummy for) post-secondary education. The top and bottom 1% earnings are trimmed. The survey in Malawi did not differentiate the levels of teachers. Sample is restricted to workers with secondary education or more. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: Surveys listed in Table 1.

Table A 20. Median regression estimates of hourly earning differentials (trimmed sample)

	All teachers	Primary teachers	Secondary teachers	Public school teachers	Public school teachers relative to other public sector employees
	(1)	(2)	(3)	(4)	(5)
Burkina Faso	0.764***	0.798***	0.539***	0.871***	0.648***
	(0.093)	(0.097)	(0.208)	(0.099)	(0.102)
Côte d'Ivoire	0.840***	0.872***	0.764***	1.042***	0.542***
	(0.135)	(0.183)	(0.188)	(0.163)	(0.138)
DR Congo	0.123***	0.119***	0.140*	0.098**	0.101***
	(0.037)	(0.040)	(0.078)	(0.039)	(0.035)
The Gambia	-	-	-	-	-
	-	-	-	-	-
Ghana	0.270***	0.246***	0.305***	0.314***	0.128**
	(0.053)	(0.065)	(0.074)	(0.060)	(0.056)
Liberia	0.012	0.047	-0.041	0.121	0.218**
	(0.081)	(0.088)	(0.162)	(0.096)	(0.088)
Malawi	0.190***	-	-	0.283***	0.168**
	(0.069)	-	-	(0.075)	(0.073)
Namibia	0.527***	0.563***	0.467***	0.525***	0.449***
	(0.076)	(0.090)	(0.115)	(0.079)	(0.059)
Niger	0.081	0.133	-0.022	0.155	-0.046
	(0.098)	(0.108)	(0.179)	(0.107)	(0.093)
Nigeria	-0.208***	-0.246***	-0.075	0.016	-0.078
	(0.077)	(0.092)	(0.122)	(0.080)	(0.080)
Senegal	0.553***	0.585***	0.519***	0.608***	0.349***
	(0.065)	(0.084)	(0.099)	(0.064)	(0.058)
Sierra Leone	0.124	0.146	0.092	0.033	0.173
	(0.130)	(0.152)	(0.196)	(0.146)	(0.148)
Tanzania	0.034	0.021	0.035	0.048	-0.075*
	(0.050)	(0.057)	(0.082)	(0.052)	(0.043)
Uganda	-0.176*	-0.187*	0.287	-0.166	-0.394***
	(0.100)	(0.105)	(0.188)	(0.119)	(0.115)
Zambia	0.546***	0.532***	0.568***	0.585***	0.299***
	(0.065)	(0.072)	(0.108)	(0.069)	(0.040)

Notes: Each column reports the coefficient in the median regressions of ln (hourly earnings) on (a dummy for) a type of teachers with controls. The comparison group are other wage workers in columns 1-5 and other public sector employees in column 6. Controls include gender, age, age-squared, urbanicity and (a dummy for) post-secondary education. The top and bottom 1% earnings are trimmed. The survey in Malawi did not differentiate the levels of teachers. Sample is restricted to workers with secondary education or more. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: Surveys listed in Table 1.

Table A 21. Monthly earnings differentials between teachers and other wage workers (without in-kind payments)

	All teachers		Primary teachers	Secondary teachers	Public school teachers	Public school teachers relative to other public sector employees
	OLS	Median			OLS	
	(1)	(2)	(3)	(4)	(5)	(6)
Burkina Faso				N.A.		
Côte d'Ivoire				N.A.		
DR Congo				N.A.		
The Gambia				N.A.		
Ghana	0.059	-0.002	0.038	0.089	0.140***	-0.064
	(0.044)	(0.046)	(0.054)	(0.063)	-0.049	-0.055
Liberia	-0.445***	-0.256***	-0.404***	-0.607***	-0.347***	-0.360***
	(0.082)	(0.087)	(0.090)	(0.169)	(0.097)	(0.104)
Malawi	0.085	0.226***				0.137**
	(0.056)	(0.055)		N.A.		(0.061)
Namibia				N.A.		
Niger	-0.188	-0.151	-0.072	-0.535**	-0.054	-0.229
	(0.142)	(0.099)	(0.159)	(0.258)	(0.155)	(0.194)
Nigeria	-0.248***	-0.268***	-0.288***	-0.178*	-0.037	-0.173**
	(0.070)	(0.072)	(0.081)	(0.108)	(0.077)	(0.070)
Senegal				N.A.		
Sierra Leone	-0.443***	-0.145	-0.523***	-0.328*	-0.399***	-0.405**
	(0.127)	(0.098)	(0.152)	(0.175)	(0.139)	(0.160)
Tanzania				N.A.		
Uganda	-0.173**	-0.254***	-0.210**	0.013	-0.143	-0.408***
	(0.077)	(0.084)	(0.081)	(0.148)	(0.092)	(0.097)
Zambia				N.A.		

Notes: Each column reports the coefficient in the regressions of ln (monthly earnings) on (a dummy for) a type of teachers with controls. The comparison group are other wage workers in columns 1-5 and other public sector employees in column 6. Controls include gender, age, age-squared, urbanicity and (a dummy for) post-secondary education. The top and bottom 1% earnings are trimmed. The survey in Malawi did not differentiate the levels of teachers. The surveys in Burkina Faso, Côte d'Ivoire, DR Congo, The Gambia, Namibia, Senegal, Tanzania and Zambia did not report in-kind payments. Standard errors in parentheses. Sample is restricted to workers with secondary education or more. *** p<0.01, ** p<0.05, * p<0.1. Source: Surveys listed in Table 1.

Table A 22. Association between teacher salaries and student test scores

	Grades 2 and 6		Grade 2		Grade 6		Grades 2 and 6		Grade 2		Grade 6	
	Coef.	(SE)	Coef.	(SE)	Coef.	(SE)	Coef.	(SE)	Coef.	(SE)	Coef.	(SE)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
All	10.13***	(2.08)	13.5***	(2.79)	5.00**	(2.52)	5.91***	(2.22)	8.11***	(3.08)	3.43	(2.39)
Benin	-1.43	(5.77)	25.0***	(8.97)	-15.0**	(6.38)	-19.5***	(6.09)	-19.6	(13.5)	-16.5**	(6.56)
Burkina Faso	24.6***	(6.71)	24.9***	(7.87)	24.0*	(12.7)	30.4**	(12.9)	22.7	(19.0)	41.4**	(17.7)
Burundi	-9.76	(7.44)	-14.9	(11.0)	0.484	(4.53)	-13.2*	(6.97)	-21.7*	(11.7)	-2.68	(5.30)
Cameroun	6.98	(5.31)	12.4	(8.06)	-0.045	(7.19)	10.9*	(5.67)	17.9**	(8.64)	5.24	(5.19)
DR Congo	9.33*	(5.33)	5.22	(7.52)	16.6***	(5.53)	2.88	(3.29)	-3.35	(5.13)	9.78***	(3.60)
Côte d'Ivoire	20.1***	(5.60)	21.9***	(7.29)	16.73**	(8.43)	11.6*	(6.13)	19.9*	(10.1)	4.57	(6.72)
Niger	5.56	(4.56)	24.4**	(11.0)	-0.67	(3.81)	3.36	(4.27)	23.4*	(11.8)	0.172	(3.55)
Senegal	18.1**	(8.11)	9.04	(11.6)	35.0***	(7.14)	-5.76	(6.16)	-10.4	(7.58)	7.15	(6.26)
Tchad	3.96	(5.50)	5.17	(7.01)	0.77	(7.70)	-0.669	(5.89)	3.31	(7.04)	-0.682	(8.17)
Togo	14.4***	(3.73)	18.2***	(5.13)	7.75	(5.04)	18.0***	(4.39)	20.2***	(5.74)	13.1**	(6.27)
Controls	No		No		No		Yes		Yes		Yes	

Note: Table reports the coefficient on ln(salary) in regressions of test scores (averaged across reading and math) on ln(salary) without and with controls. Each coefficient/standard error pair is from a different regression. Controls are gender, experience and its square, years of schooling, highest education degree obtained, duration of preservice training, whether the teacher is also the principal, and contract status. Pooled model includes country fixed effects. Model groups across grades includes a dummy variable for grade 6. Robust standard errors (clustered at the teacher level) are reported in parenthesis. Source: PASEC 2014.

Table A23. Correlations of teacher monthly earnings differential and structural factors

	Monthly earnings differential	Hourly earnings differential
GDP per capita	0.41	0.31
	(0.13)	(0.29)
% wage workers in the labor force	0.39	0.32
	(0.15)	(0.26)
% of women in other wage jobs	-0.29	-0.29
	(0.30)	(0.32)
Female labor participation rate	-0.02	-0.003
	(0.93)	(0.99)
Rate of teacher unionization	0.61	0.41
	(0.20)	(0.42)
Teacher/labor force ratio	-0.01	-0.04
	(0.97)	(0.90)
Average annual change in	-0.09	0.07
teacher/labor force ratio	(0.74)	(0.80)

Notes: P-values in parentheses. Source: Surveys listed in Table 1. Teacher/labor force ratio and average annual change in teacher/labor force ratio are from PASEC (2014).