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Worldwide Bureaucracy Indicators

Methodology, Insights, and Applications



Bureaucracy Lab



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Foreword

Effective governments are critical to attain the World Bank Group's twin goals of ending extreme poverty and boosting shared prosperity. Therefore, the World Bank provides substantial financial and technical assistance to developing countries all over the globe to strengthen state capacity. A critical component of state capacity is human resources.

The Worldwide Bureaucracy Indicators are a direct response to calls from the World Bank's teams and client governments for more rigorous and granular data on public sector employment and compensation policies to support evidence-based reforms. This unique and comprehensive global dataset will enable an improved understanding of the quality, competitiveness, equity, representativeness, and efficiency of public sector employment and compensation regimes.

As a cross-national dataset on public sector employment and wages, it will help governments make more informed decisions on interventions to improve the productivity of their human resources for better service delivery and improved welfare of citizens.

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Abbreviations

COVID-19	coronavirus disease 2019
EEA	European Economic Area
EU-SLIC	European Union Statistics on Income and Living Conditions
GDP	gross domestic product
GFSM	Government Finance Statistics Manual
I2D2	International Income Distribution Database
ICP	International Comparison Program
ICSE	International Classification of Status in Employment
ILO	International Labour Organization
ILOSTAT	International Labour Organization Department of Statistic
IMF	International Monetary Fund
LABLAC	Labor Database for Latin America and the Caribbean
LIS	Luxembourg Income Study
OECD	Organisation for Economic Co-operation and Development
QoG	Quality of Government
SOE	state-owned enterprise
WGI	Worldwide Governance Indicators
WWBI	Worldwide Bureaucracy Indicators

Executive Summary

Public sector employment and compensation practices have broad implications for public sector productivity, fiscal sustainability, and the competitiveness of the overall labor market. The public sector workforce is responsible for the provision of state services, the shaping and implementation of state policies, and the administration of regulations. Public sector employment and wages are two of the most important inputs into the government production function, and therefore, important determinants of state capacity and public sector productivity. Additionally, public sector employment and compensation practices have important implications on the overall fiscal position of the government through the public sector wage bill. Finally, given the primacy of the public sector as the single largest employer in most economies, the size and composition of its workforce and their wages can reshape the equilibrium within the overall labor market.

There are several important questions about the public sector workforce that governments regularly need to address. What is the appropriate level of employment in the public sector as a whole and for essential workers like public administrators, teachers, and doctors? Is the public sector wage bill affordable? Does the public sector pay competitive wages compared to the private sector to attract talent while not crowding out private sector jobs? Does the public sector pay equal wages to workers in similar jobs and with similar skills? Does the public sector promote gender equality in employment? And are public sector pay and employment practices contributing to higher public sector productivity, better service delivery, and improved governance?

Answering these questions requires high-quality, cross-country data on public sector employment and compensation, which the Worldwide Bureaucracy Indicators (WWBI) dataset provides. The WWBI includes 192 indicators that are estimated from microdata drawn from the labor force and household welfare surveys and augmented with administrative data for 202 economies. Indicators cover five categories: the demographics of the private and public sector workforces; public sector wage premiums; relative wages and pay compression ratios, gender pay gaps; and the public sector wage bill. The micro and administrative data utilized in the construction of the WWBI are drawn from data catalogs that house surveys conducted by national statistical organizations or multilateral organization data teams. In short, the WWBI is the most comprehensive and robust global dataset on the public sector workforce in the world.

The WWBI reveal several, often surprising, stylized facts about the public sector workforce. The public sector is often the largest employer in most countries and is an especially dominant source of formal jobs in many low and middle-income countries. Globally, it accounts for 16 percent of total employment and over 30 percent and 37 percent of paid and formal sector employment, respectively. Many of these public sector workers provide critical services. For example, three-fourths of the global education workforce and two-thirds of the healthcare workforce are employed in the public sector. The average public sector employee is four years older, 37 percent more likely to be female, twice as likely to have a tertiary degree, and more likely to be an urban inhabitant than their private sector counterparts.

The public sector is also a relatively well-paying employer for certain types of workers. Public employees in most nations receive a wage premium compared to similar workers in the private sector. Public sector workers have approximately 19 percent higher basic wages (excluding allowances and bonus payments) across the 111 countries for which the World Bank has data, with 80 countries having a positive premium. These wage premiums have also been rising over the past decade in low- and middle-income countries. The size of this premium is not uniform and varies by personnel characteristics and occupations. The premium is higher for workers with primary or secondary education than those with tertiary education, and it is higher for workers in elementary and clerical occupations than those in technical or managerial jobs. Public sector premia, in general, are likely to be higher when benefits are accounted for, as a much higher proportion of public sector workers enjoy formal contracts and have access to health insurance and pensions.

The WWBI provides unique insights on the equity and representativeness of the public sector. Females are the majority of public sector workers in 55 nations. They enjoy almost a 30 percent wage premium over females employed in the private sector, but remain outnumbered by males in managerial positions and within the top three income quintiles. Even in industries where they predominate, such as education and healthcare, they still experience a significant gender wage penalty of 13 and 17 percent, respectively, compared to similarly educated and experienced male workers.

There is considerable cross-country heterogeneity in all the major indicators of employment, compensation, and the wage bill. The public sector is a much bigger source of formal employment in Sub-Saharan Africa, South Asia, and the Middle East than in Latin America or Europe. The share

of the public sector workforce devoted to providing education and healthcare increases with country incomes, signifying that as countries develop, they experience increases in demand for the provision of social services. Additionally, the public sectors of high- and upper-middle-income countries are relatively more representative for women than those in low- and lower-middle-income peers. While there is considerable variance in the size of that premium across countries, varying from a penalty of 33 percent to a premium of 100 percent, the variance is not correlated to the level of economic development enjoyed by countries. However, high-income countries overall have experienced a relative decline in premia since 2000, while they have been increasing in other countries. Globally the wage bill represents about 30 percent of government expenditures—with significant variation around this average and the wage bill taking up almost half of all government expenditures in many low- and middle-income countries. However, there is no discernible impact of a high-wage bill on fiscal balances implying that wage bill growth impacts fiscal sustainability due to the wage bill's affordability given country income and not their absolute size.

The coronavirus disease 2019 (COVID-19) pandemic and its impacts on fiscal space across countries at all levels of economic development further underscore the importance of consolidating public expenditures without impacting productivity and service delivery. Therefore, the WWBI comes at an opportune time and has several analytical and operational applications. It can be a source for global benchmarking on pay and employment that policy makers and development practitioners can use as part of their regular monitoring activities. Effective management of public sector employment and compensation is a vital activity for fiscal sustainability and expenditure efficiency, and the WWBI can inform core World Bank analytical products, such as public expenditure reviews and wage bill assessments. Building representative bureaucracies should be an important policy objective of governments, and the WWBI represents an ideal tool for benchmarking the varying successes of different countries. The data can be used to analyze public sector labor productivity, such as service delivery outcome indicators per service delivery staff and links between the characteristics of the workforce, human resource management, and the overall quality of governance. Given its nuanced coverage of public and private sector employment along with decomposition by occupations, industries, and levels of education, the WWBI can shed light on the public sector's ability to affect labor allocations between the public and the private sectors and the overall impact on jobs.

1. What Are the Worldwide Bureaucracy Indicators?

Effective management of public sector employment and compensation is a vital activity of governments with broad implications for fiscal sustainability, public sector productivity, and the competitiveness of the overall labor market. Public sector employment and wages are arguably two of the most important elements of the government production function responsible for delivering infrastructure, regulations, and services to businesses and citizens. Government expenditures in the form of employee salaries and benefits represent a large proportion of total public expenditures with obvious fiscal sustainability and expenditure efficiency implications. Additionally, the public sector is a large employer, and changes in the size of the public sector workforce or government wages are likely to produce significant effects across the entire labor market and the overall economy. In many low- and middle-income countries, especially those experiencing fragility, public sector employment is the core ingredient of an official, or even implicit, political settlement. The public sector wage bill has immediate and often important implications for political stability, peace, and security.

The objective of the Worldwide Bureaucracy Indicators (WWBI) is to provide comprehensive, cross-national data on public sector employment and compensation to help policy makers, development practitioners, and researchers answer several important questions. They include:

- Are public sector pay and employment practices contributing to higher public sector productivity, better service delivery, and improved governance?
- What is the appropriate level of employment in the public sector as a whole and for essential workers, such as public administrators, teachers, and doctors?
- Is the public sector wage bill affordable?
- Does the public sector pay competitive wages compared to the private sector?
- Is public sector compensation distorting the supply of labor and leading to skills shortages in the private sector?
- What is a typical distribution of public sector employment by skills, demographics, and occupations?
- Does the public sector pay equal wages to workers in similar jobs and with similar skills?
- Is the public sector a gender equal employer?

The WWBI indicators present a granular picture of public sector labor markets across the world based on objective, micro-level data. Its indicators are constructed from 909 nationally representative household surveys undertaken by their respective national statistical authorities that have substantial experience in designing and executing surveys, often aided by World Bank or other multilateral organizations. The dataset is further augmented with administrative data bringing the WWBI's total coverage to 192 indicators across 202 countries and territories between 2000 and 2018. The more than 110,000 individual observations included in the WWBI are estimated using a robust and empirically rigorous methodology detailed in chapter 2 to provide objective indicators on public employment and wages, improving on and supplanting existing datasets.

The WWBI is the only dataset that can be used to address these questions for a large number of countries, given the limited scope and coverage of existing data sources. The ILOSTAT dataset of the International Labour Organization (ILO) is the closest to the WWBI in scope. While it includes many cross-national indicators on employment and compensation across industries, occupations, and individual demographics, only a handful of these are related to the size of employment in the public sector. The WWBI's entire slew of indicators, on the other hand, explicitly target this segment of the labor market. Moreover, none of the indicators included in ILOSTAT directly compare public and private sector workers or present indicators of public sector wages, while the WWBI pays particular attention to this nexus given the important interactions between these two sectors. This makes the ILO dataset unusable for examining many of the questions on public sector wages, including public-private wage comparisons and cross-national public sector wage comparisons, that not only can impact public sector productivity and motivation, but also extend to the effects on wage setting mechanisms in the private market. Another major source of data on the public sector is from the Government at a Glance dataset of the Organisation for Economic Co-operation and Development's (OECD). While the OECD does present some fine-grain measures of public sector employment and compensation, similar to the WWBI, these exist only for its 36 member countries, all of which are also included in the WWBI. Further, the OECD's dataset does not juxtapose the public and private sectors while investigating the patterns of employment and compensation.

The WWBI complements existing, perception-based measures of public sector institutional quality. A second set of datasets on the public sector focus on public sector

efficiency, transparency, and service delivery. These datasets, such as the Worldwide Governance Indicators (WGI) and the Quality of Government (QoG), are based on expert-perception measures of aspects of organizational and human resource management that ordinarily rank countries and territories across composite indices constructed in turn from other sources or expert assessments. Given the specific nature of these datasets, they cannot provide information on the size, composition, competitiveness, or equity within the public sector. These perception-based indicators are well suited to situations where data constraints inhibit empirical analysis, as is the case of intangible outputs or illicit activities. One example of the former is sentiments on bureaucratic quality as tracked by the QoG of the WGI's Government Effectiveness Index, where the intangible nature of public sector productivity does not lend itself easily to quantification of output. Similarly, the WGI's Control on Corruption indicator exemplifies the latter where the furtive nature of the activity combined with a heterogenous distribution of law enforcement capacity to intercede across countries and over time impedes the development of evidence-based metrics. While unique in their own right, both these datasets represent natural compliments to the WWBI, which in conjunction can help examine the relationship between employment and compensation and institutional quality.

The WWBI is part of a larger effort at providing an empirical foundation to study the public sector. The Bureaucracy Lab—a collaboration between the Governance Global Practice and the Development Impact Evaluation department of the Development Economics Vice Presidency—aims to promote evidence-based World Bank policy advice and government policy making on the public sector workforce through the creation of new datasets, diagnostic instruments, and knowledge products. Since its inception in 2018, the WWBI has sought to provide an analytical foundation to questions on the appropriate levels of employment and compensation for public sector workers. This report represents the latest iteration in a series of reports and empirical papers (Baig et al. 2021; Gilding et al. 2020; Hasnain et al. 2019).

This report is organized into four chapters. Chapter 2 provides details on the methodology used to construct the WWBI, including a description of the data sources and estimations used for the different indicators. Chapter 3 presents the main findings that emerge from the dataset on some of these core questions. Chapter 4 concludes by presenting potential policy and research applications of the dataset.

2. How Were the Indicators Constructed?

Chapter 2 presents a brief description of the methodology used in constructing the dataset, including its structure, working definitions for constructing indicators, main data sources, and statistical techniques employed within. The dataset is publicly available through the World Bank Data Catalog located [here](#), where a detailed codebook and explanatory note that delves into further detail can also be found. Given that this is the third iteration of the dataset with each receiving methodological updates over time, in the service of transparency, the entire Stata code used in cleaning and estimation of not only this version but all former versions have been archived on GitHub [here](#).

Organization of the Dataset

The WWBI is constructed with a deliberate effort to harmonize multiple data streams to offer comparable and consistent estimates across time and space. The WWBI encompasses five categories of variables (see table 1 for definitions):

- The demographics of the public and private sector workforces (107 indicators);
- Public sector wage premiums (39 indicators);
- Relative wages within the public sector (35 indicators);
- Gender pay gaps (9 indicators); and
- The public sector wage bill (2 indicators).

The demographics of public and private employment track key characteristics of the public sector workforce, including size (in absolute and relative numbers), age, and distribution across sex, rural and urban locations, academic qualifications, wage quintiles, industry categories, and occupational groups. Indicators on public sector wage premiums capture the overall competitiveness of public sector wages (compared to the private sector) as well as the decomposed public-private wage differential by sex, academic qualifications, industry category, and occupation group. Indicators on pay compression ratios present the relative wages of the top and bottom earners in the public and private sectors, the ratios of wages for employees of occupational categories in the public and private sector, the

relative wages of key occupations within the public sector, and the cross-country comparisons of the compensation of public sector workers by occupation. Indicators on the gender pay gap compare the wages of females to their male colleagues in the public and private sectors as well as decomposed pay gap by industry of employment. Finally, indicators on the relative size of the wage bill offer a glimpse into the structure and affordability of the public sector within the larger economy. Altogether, these indicators provide an important, albeit narrow, picture of the skills and incentives of bureaucrats. They are further expounded on in the WWBI's methodological codebook located [here](#).

TABLE 1 - WWBI Indicators

Indicator	Description
Demographics of the private and public sector workforces	
Public sector employment as a share of total, paid, or formal employment	Proportion of workers in the public sector using ICSE to define public and private sectors and employment types (total, wage, and formal)
Public sector employment distribution by demographic	Proportion of workers in the public and private sectors based on key identifiers (mean and median age, male versus female, rural and urban divide, level of academic qualification, industry types, and occupational groups)
Gender disaggregation of public and private sector employment	Distributions of female employment across public and private sectors disaggregated by occupational groups, industries categories, and wage quintiles
Industrial disaggregation of public and private sector employment	Distribution of public and private sector workers by industry along employment types (total, wage, and formal)
Social safety nets in the public and private sectors	Share of public and private sector workers with various types of benefits (formal contracts, social security, health insurance, and union membership)
Sample sizes, including by industry categories	Total observations, number reporting employment, paid employment, public sector employment, and employment by industry
Public sector wage premiums	
Public sector wage premiums	Percentage differences in public and private sector wages (controlling for education, age, gender, and location)
Public sector wage premiums (significance levels)	P-values for public sector wage premium regressions for paid and formal wage employees
Disaggregated public sector wage premium by sex, education, industry, and occupation	Percentage differences in public and private sector wages (controlling for education, age, gender, and location) disaggregated by sex, levels of academic qualification, occupational groups, or industrial categories

Indicator	Description
Disaggregated public sector wage premiums (significance levels)	P-values for disaggregated public sector wage premium regressions disaggregated by sex, levels of academic qualification, occupational groups, or industrial categories
Gender pay gaps	
Gender pay gap	Percentage differences in public and private sector wages for females compared to males
Gender pay gap (significance levels)	P-values for gender wage differential regressions
Disaggregated gender pay gap by industry	Percentage differences in public and private sector wages for females compared to males disaggregated by industry of employment
Disaggregated gender pay gap (significance levels)	P-values for gender wage differential regressions disaggregated by industry of employment
Gender wage ratios	Ratios of female to male wages in the public and private sector by mean and median workers
Relative wages and compression ratios	
Pay compression ratios (90th/10th percentiles) for public and private sectors	Ratios of wages of 90th percentile and 10th percentile wage earners in the public and private sector
Relative wages in public and private sectors by occupation	Ratios of wages for managers, professionals, and technicians compared to clerks in the public and private sectors
Wage compression ratios in public sector, by occupation	Ratios of wages for indexed occupations to clerical occupations in the public sector
Cross-country wage ratio, by occupation (mean and median)	Ratio of wages of indexed occupations within reference country to the global median or mean for the same category
Public sector wage bill	
General government wage bill as a percentage of GDP	General government wage bill in proportion to country GDP (based on PPP; 2009 U.S. dollars)
General government wage bill as a percentage of government expenditures	General government wage bill in proportion to total general government expenditures (based on PPP; 2009 U.S. dollars)

Source: World Bank

Note: GDP = gross domestic product; ICSE = International Classification of Status in Employment; PPP = purchasing power parity.

Cumulatively, these indicators provide an empirical measure of multiple dimensions of public sector capacity. They are directed toward both researchers—quantitative and comparative—interested in cross-national and temporal differences in the organization of the public sector and policy practitioners and development professionals aiming to benchmark trends between countries and over time.

Definitions

Public Sector

For the WWBI to directly compare public and private sector employment and compensation requires a globally harmonized definition of the public sector. However, this need is hindered by issues of comparability emerging from the heterogeneous definition of public employees across countries. To overcome this obstacle, the WWBI, as a guiding principle, utilizes the classification of the “public sector” compared with the more narrowly defined “general government” by the *Government Finance Statistics Manual* (GFSM) published by the International Monetary Fund (IMF). Definitions follow and are represented in figure 1.

- The public sector consists of all institutional units controlled directly, or indirectly, by the central and subnational governments as well as public corporations that are engaged in a market-based activity. The public sector is the general government as well as public or state-owned.
- The general government consists of all institutional units in the country that fulfill the functions of government as their primary activity, which includes central and subnational budget funded and nonmarket, nonprofit institutions.

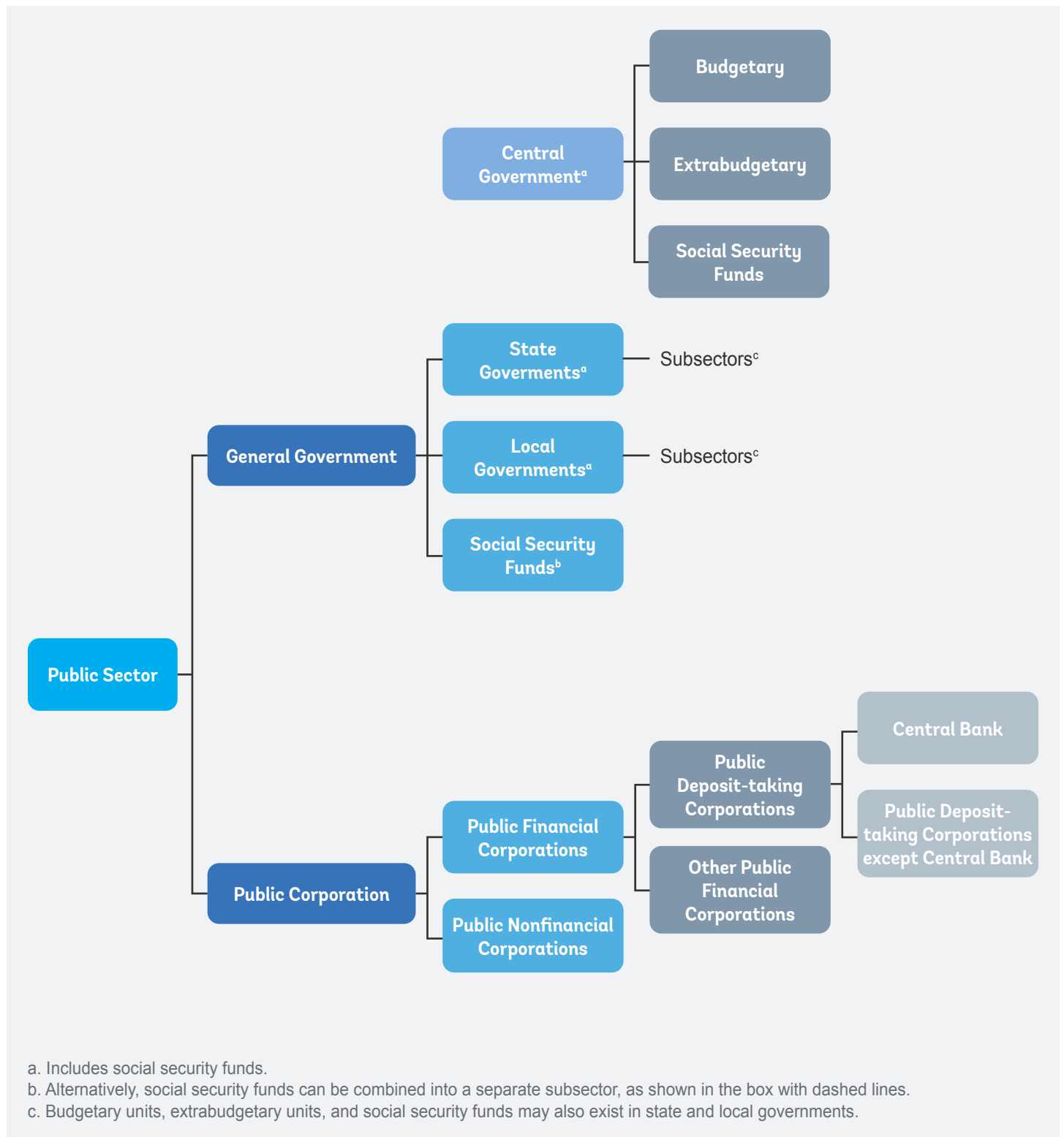
Moreover, the definition of public sector employment also corresponds to the one laid out by the ILO:

“The total public sector employment covers all employment of general government sector as defined in System of National Accounts 1993 plus employment of publicly owned enterprises and companies, resident and operating at central, state (or regional) and local levels of government. It covers all persons employed directly by those institutions, without regard for the particular type of employment contract.”¹

Utilizing the more broadly defined public sector allows for a clearer juxtaposition of the public and private sectors and a more comprehensive comparative analysis. Additionally, given the self-reported nature of household survey data used in the construction of the indicators, using the broader definition ensures a more globally consistent definition that includes all individuals employed within the core public administration, security sector, and public sector education and healthcare workforces, as well as individuals employed in public institutions, including central banks and state-owned enterprises (SOEs). Significant effort is made to align all surveys to this broader definition. The only exception is data on countries within the European Economic Area (EEA) between 2004 and 2018. For these countries and years, the analysis is based on the smaller general government aggregate due to the unique nature of the data for this subset of countries using the definition of the United Nations System of National Accounts. It refers to “public offices at all levels of government, [including] nonmarket publicly owned hospitals, schools, and social security organizations,” but excludes “public or quasi-public corporations, even when all the equity of such corporations is owned by government units” (European Commission 2014, 12). Specifically, the classification of public sector employees in the EEA uses economic activity rather than sector (see box 1).

1. The definition appears in ILOSTAT’s glossary of statistical terms online at <https://ilostat.ilo.org/resources/concepts-and-definitions/glossary/#P>. For more information on the System of National Accounts, see United Nations et al. 1993; 2009.

FIGURE 1 - Public Sector Organizational Classifications



Source: World Bank 2021.

BOX 1 - Public Sector in the European Economic Area

The identification of public and private sector employees is based on a specific question that explicitly asks for the sector of employment within each survey. This is the case for the microdata sourced from the I2D2, LAC Equity Lab, and LIS data repositories. The only exception to this is the data sourced from Eurostat's European Union Statistics on Income and Living Conditions for countries within the European Economic Area. For these countries, an approximation of the public sector by combining NACE Rev. 2 industry classifications "O" which covers public administration, defense and compulsory social security, P which accounts for human health services and "Q" covering education services to represent the public sector (European Communities 2008). Therefore, unlike the definition of public sector employees used for all other surveys, this definition does not include public sector workers employed in public and quasi-public corporations. Therefore, constructing an identifier for public sector workers using industry classification more closely aligns with the definition of the general government as opposed to public sector. There are drawbacks associated with this approach as not all individuals employed in education and health services operate in the public sector which may overestimate the size of the public sector. Still, the aggregation of these three provides a fair approximation to the general government, especially for countries in the European Union given the large public sector healthcare and education sectors as is standard practice within the literature (see Christofides and Michael 2013; de Castro, Salto, and Steiner 2013; European Commission 2014; Giordano et al. 2015).

Note: NACE is the acronym used to designate the various statistical classifications of economic activities developed since 1970 in the European Union.

Employment

The classification of employed individual, paid employee, and public paid employee is based on labor and employment status and type of sector. Definitions for total and formal employment are based on the ILO's International Classification of Status in Employment (ICSE),² making the WWBI and ILOSTAT databases cross-compatible despite fundamental differences in survey coverage, representation, sample size, and timing. According to the ICSE, total employment is defined as:

"[A]ll those of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit. They comprise employed persons 'at work', i.e., who worked in a job for at least one hour; and employed persons 'not at work' due to temporary absence from a job, or to working-time arrangements (such as shift work, flextime, and compensatory leave for overtime)."³

Wages

Wage data in the WWBI denote the income associated with the occupation of employment used in the analysis (i.e., income from which the individual dedicated the most time in the week preceding the survey) and excludes both bonuses, allowances, and other cash or in-kind payments from the same job as well as all additional sources of income (from other jobs) or investments and transfers. Due to the almost complete lack of information on taxes, the wage from primary job is not net of taxes. For all those with self-employment or their own businesses, wage data corresponds to net revenues (net of all costs excluding taxes) or the amount of salary withdrawn from the business.

Wage information in the surveys is reported in each country's local currency unit, with a diverse array of periodicity. Great care is taken to identify the exact frequency of income for each individual within the surveys and convert all wages to weekly wage after accounting for varying levels of hours worked to ensure credible comparisons across individuals and groups. Additionally, to control for the effect of possibly spurious outliers, the wage variables are winsorized by limiting extreme values in the survey data at the top 0.01 percent level.⁴

2. For more information on ICSE's concepts and definitions, visit <https://ilostat.ilo.org/resources/concepts-and-definitions/classification-status-at-work/>.

3. The 19th International Conference of Labour Statisticians in 2013 adopted revised standards concerning statistics of work, employment, and labor underutilization (ILO 2013). They included a narrowing of the definition of employment to work performed for pay or profit, which would exclude, for example, activities where the self-declared main intended use of the output is for own/family consumption. Hence, these revised standards no longer apply to employment or labor force participation rates.

4. Winsorization was used in the analysis of wage data in the WWBI to eliminate the impact of extreme values within the dataset on the coefficients to avoid possibly spurious outliers. This approach also ensures that no observations are removed but that outliers above 99.9 percent of the distribution are set to a specified percentile of the data; for example, a 99.9th percentile in the data.

Data Sources

All of the indicators included in the WWBI are derived from primary sources. Most of the indicators are estimates by the WWBI team from household survey data. The remainder were sourced from partner multilateral organizations and were based on public sector administrative data. Cumulatively, the WWBI are drawn from the following six sources:

- World Bank’s International Income Distribution Database (I2D2), Revision 7
- World Bank’s Latin America and the Caribbean Equity Lab (LAC Equity Lab) data catalog
- Eurostat’s European Union Statistics on Income and Living Conditions (EU-SLIC) database
- LIS Cross-National Data Center, Luxembourg Income Study (LIS) database
- IMF Government Compensation and Employment dataset
- International Comparison Program (ICP) 2017 Cycle, Data for Researchers database

Of the 909 surveys used, 550 surveys included in the WWBI were sourced from the World Bank’s I2D2 database which stores nationally representative surveys—both household welfare and labor force surveys—globally, harmonizing data using a common taxonomy applied to all countries and surveys. To these, 343 labor force surveys from 29 European countries were coded from the EU-SLIC data catalog. Finally, 4 surveys from the LIS Cross-National Data Center’s catalog and 12 surveys from the World Bank’s LAC Equity Lab database were added with a total coverage of 909 surveys from 135 countries. (table 2). As a complement to the above, wage compression ratios in the public sector for 167 economies from the ICP and data on the public sector wage bill for 177 countries (and territories) from the IMF’s Government Compensation and Employment Dataset were added to the dataset bringing the final geographical coverage of the WWBI to 202 economies. These are further expounded on in the WWBI’s methodological codebook located [here](#).

TABLE 2 - WWBI Coverage by Data Source

WWBI Data Sources	Surveys	Countries
WB International Income Distribution Database	550	109
EU Statistics on Income and Living Conditions Dataset	343	29
WB Latin America and the Caribbean Equity Lab	12	12
LIS Database	4	4
IMF Government Compensation and Employment Dataset	6,280 observations	177
ICP Data for Researchers database	3,497 observations	167
Total	909	202

Source: Worldwide Bureaucracy Indicators.

Note: EU = European Union; ICP = International Comparison Program; IMF = International Monetary Fund; LIS = Luxembourg Income Study; WB = World Bank.

Methodology

Most of the indicators included in the WWBI are derived from survey data, while the remainder were sourced from the IMF and the ICP, which are based on public sector administrative data. While public sector administrative data are potentially a more accurate and detailed measure of employment and wages in the public sector, they do not allow for comparisons with the private sector. Moreover, many countries lack administrative and information technology systems to be able to regularly and effectively produce accurate data on public sector employment and compensation. Finally, a heterogenous adherence to standardized GFSM

definitions of the public sector or general government creates challenges for cross-national comparisons.

Household surveys have certain advantages—and some shortcomings—over administrative data as a source of information on public sector and general government employment and wages. One of the main advantages of household surveys is that they provide a rich, consistent, and regularly updated set of variables for a variety of worker characteristics in the public and private sectors that enable robust, controlled comparisons between the two groups. The surveys on which the WWBI are derived are some of the most professionally conducted surveys in the world, undertaken by national statistical authorities and frequently supported or managed by World Bank or multilateral organization data teams with substantial experience in designing and executing such exercises. The harmonization process that brought the surveys used in the WWBI together was managed by survey experts from across the World Bank.

At the same time, heterogeneity within surveys due to differences in questionnaire design between countries and over the years limits the ability to apply a uniform coding schema to a large set of indicators. Therefore, the WWBI team relies on a core set of variables that are common to most if not all surveys for the construction of indicators. Additionally, surveys are based on self-reported quantities and thus are vulnerable to systematic errors that may be related to the level and characteristics of employment and income. Every effort was made to provide as coherent and unbiased a dataset as possible. However, because the database is based on worldwide welfare and labor force surveys, there may still be inconsistencies in the indicators over time due to differences in primary data sources that users may need to consider.

Further, definitions of contracts or insurance may not be externally consistent except in the broadest terms. Survey questions vary from country to country in both the wording of the question, its intention, and its local understanding. Additionally, there is no indication that these terms are based on internationally accepted concepts and are included for a smaller sample of countries.

Survey Selection and Initial Data Quality Checks

To ensure the quality of the estimates presented in the WWBI, all surveys proposed for inclusion underwent a screening process. Included in this chapter is a brief description of

the techniques used for dataset selection. This process is described in greater detail in the WWBI's methodological codebook located [here](#). A final set of surveys was selected for analysis. First, surveys included were ensured to have sound coverage across key variables used in constructing the indicators (no variables with more than 40 percent of observations missing). To minimize potential biases emerging from estimating statistics in the presence of large swaths of missing observations, filters were designed to identify surveys with the sufficient number of observations for four sets of core variables: employment; wages; demographics (age, gender, and rural and urban split); and education. Surveys with over 40 percent of missing or incorrectly coded (as defined by the survey questionnaire) observations for employment-related indicators were excluded from the WWBI. This was done because of the critical role of employment-related variables for every indicator. For the remaining three filters, only the relevant set of indicators were discarded from the analysis. As an illustration, for surveys with more than 40 percent of observations missing for wage data, all indicators related to public sector compensation are excluded from analysis.

Second, the surveys were included only if they had a sufficient number of observations for public sector employees to be able to construct statistically reliable statistics. Third, surveys were chosen if they were representative at the national level and included employees from the entire country. Finally, for multiple surveys for a given country for the same years, it was ensured that the same survey source was used over the years (contingent on being available and meeting data quality standards). However, a differing dataset was utilized if it offered greater precision. All four steps are briefly described in the section that follows.

Construction of Indicators

Demographics of the Private and Public Sector Workforces

The construction of all indicators included in the WWBI rests on the precise identification of employed individuals, paid employees, and public paid employees. These three definitions are essential for constructing indicators on the (absolute and relative) size of the public sector workforce and lay the foundation of all disaggregated indicators and the wage analysis. These are based on the I2D2 dataset as defined below in table 3 and described in detail in the accompanying [explanatory note and detailed codebook](#).

TABLE 3 - WWBI Labor Definitions

Variable Names	Description
<p>Labor status</p> <ul style="list-style-type: none"> • Employed • Unemployed • Non-in-labor force 	<p>Constructed for all persons administered the labor module of each survey above the internationally recognized standard of individuals aged 15 years and above as a lower age cutoff.^a Additionally, all persons are considered active in the labor force if they presently have a job (formal or informal) or do not have a job, but are actively seeking work (unemployed). Employment and unemployment definitions are taken from the surveys themselves.</p>
<p>Employment status</p> <ul style="list-style-type: none"> • Paid employee • Non-paid employee • Employer • Self-employed • Other (not classifiable by status) 	<p>Constructed for individuals identified as <i>employed</i> under labor status.</p> <p>Paid employee includes those whose basic remuneration does not directly depend on the revenue of the unit they work for and instead are typically remunerated by wages and salaries, but may be paid for piecework or in-kind.</p> <p>Non-paid employee includes contributing family workers who hold a self-employment job in a market-oriented establishment operated by a related person living in the same household who cannot be regarded as a partner because of their degree of commitment to the operation of the establishment, in terms of working time or other factors, and is not at a level comparable to that of the head of the establishment.</p> <p>Employer is a business owner (whether alone or in partnership) with employees, excluding contributing family workers.</p> <p>Own-account or self-employment includes those whose remuneration directly depends on goods and service produced (where home consumption is considered to be part of the profits) and who have not engaged any permanent employees to work on a continuous basis.</p> <p>Other workers not classifiable by status include those for whom insufficient relevant information is available and/or who cannot be included in any other category.</p>
<p>Sector of activity</p> <ul style="list-style-type: none"> • Public sector • Private 	<p>Constructed for individuals identified as employed under labor status.</p> <p>Public sector includes central government, nongovernmental organizations, armed forces, state-owned companies, and nonprofit organizations.</p> <p>Private sector is that part of the economy run for private profit and not controlled by the state.</p>

Source: World Bank 2021.

a. Given the heterogeneous application of retirement ages across countries; no upper age cutoff was used. This was done to ensure that the subsequent analysis utilized the full roster of public sector employees.

Public Sector Wage Premiums

Estimating public sector wage competitiveness compared to the private sector is methodologically complicated. The standard approach in the academic literature is to measure differences in total compensation between the public and private sectors for statistically similar workers in similar jobs. Given the demographic differences of workers between the two sectors, this approach ideally requires controlling for observable worker characteristics, such as age, education, work experience, and gender that impact human capital and therefore earnings; accounting for unobserved characteristics such as ability, risk aversion, and public service motivation; and controlling for occupations given that the similar workers can have very different responsibilities in different occupations. A simple raw comparison of average wages in the private and public sectors is misleading as public sector workers are older and more educated than their private sector counterparts, have different career objectives and motivations, and work on occupations that may not be well represented (if not entirely absent) in the private sector. To estimate the public sector wage premium, Mincerian earnings regressions were utilized, specified with a dummy variable indicating the sector of the individual.⁵ The basic specification follows:

$$\log w_i = \alpha + \beta \cdot \text{Public}_i + X_i \cdot \gamma + \epsilon_i \quad (1)$$

Where β is the adjusted public-private wage differential; $\log w_i$ is log weekly wages in local currency of employee i winsorized to exclude the top 0.01 percent of the wage distribution; Public_i is equal to 1 if the worker is employed in the public sector and 0 otherwise; and X_i is a vector of standard controls consisting of age, age squared, level of education, location (urban or rural), and gender.

Reported premiums are transformed based on equation (2) below as the untransformed $\hat{\beta}$ only provides an approximation of the actual premium and the discrepancy becomes larger when the $\hat{\beta} > \pm 20\%$. Within the WWBI, 10,358 observations for wage premiums are reported across 21 indicators and all countries and years. This simple transformation allows for a more precise estimation of premiums.⁶

$$\% \Delta y = 100 * (e^{\hat{\beta} \Delta x} - 1) \quad (2)$$

The decision to use a simple regression specification was due to the relative trade-off between a more well-specified equation and the inability to provide a large set of observations because of an inability to apply such a precise specification across multiple countries. Similarly, there is no variable in the raw data that may reasonably allow for a more precise instrument for wage differentials while controlling for selection or endogeneity. Further, incomes within the data are also limited to self-reported wages and do not include bonuses, allowances, and in-kind payments, which can be significant in the public sector. Certain surveys do include information on work benefits, such as health insurance and social security, but these are not monetized and therefore cannot be combined with the wage data to provide an estimate of total compensation.

For all decomposed wage premiums, including those disaggregated by sex, educational qualification, industrial categories, or occupational groups, equation 1 was used instead with an interacted dummy variable that indicated the sector and decomposed characteristics of the worker.

Relative Wages and Compression Ratios

Indicators on relative wages and pay compression ratios in the public sector are included in the WWBI. The relative wages of managers, professionals, and technicians (compared to clerks) in the public (and private) sectors provide a useful measure of wage progressions within both sectors. Additionally, indicators on the ratio of wages earned by the 90th and 10th percentile of the income distribution affords a window into the inequality between the top and bottom earners within the public and private sectors for each country.

To these, three sets of indicators on within- and cross-country wage ratios are added using data from the 2017 cycle of the ICP's Data for Researchers dataset. The ICP is a worldwide statistical initiative to collect and compile comparable price and national accounts expenditure data and estimate purchasing power parities for the world's economies. The program is implemented as a global partnership of national and regional agencies and managed by the ICP Global Office at the World Bank, under the auspices of the United Nations Statistical Commission. More information is available on the

5. The two main empirical approaches in the literature are the Mincerian wage regression with a dummy variable indicating whether the worker is employed in the public sector or private sector; and the Oaxaca-Blinder decomposition which does not assume that the returns to education, gender, age, and other observable worker characteristics are the same in the public and private sector. The latter method decomposes the wage differential into a part that can be explained as resulting from worker endowments, and an unexplained part presumably due to economic rents that the public sector enjoys. The two approaches in general give similar results (Gittleman and Pierce 2011); a dummy variable method is simpler to present and used here. To allow the public sector earnings differential to vary between individuals, Mincer-style wage gaps are estimated by gender, age, occupation, skill level, and other characteristics.

6. The algebraic expression of the transformation of these premiums are documented in appendix A3 of the WWBI explanatory note and codebook.

program's website [here](#). These indicators allow for a more focused inquiry into wage compression ratios both within and between the public sectors of respective countries. Based on the International Standard Classification of Occupations, they represent a natural complement to the pay compression ratios between the 90th and 10th percentile of wage earners in the public and private sectors within each country and allow for a comparison of notable occupation within the public sector of each country and across nations.

Gender Pay Gap

To estimate the gender wage gap, Mincerian earnings regressions are similar to the previous equations, except specified with a dummy variable indicating the gender of the individual. The basic specification follows:

$$\log w_i = \alpha + \beta \cdot \text{Female}_i + X_i \cdot \gamma + \epsilon_i \quad (3)$$

Where β is the adjusted public-private wage differential; $\log w_i$ is log weekly wages in local currency of employee i winsorized to exclude the top 0.01 percent of the wage distribution; Female_i is a dummy equal to 1 if the worker is female; and X_i is a vector of standard controls consisting of age, age squared, level of education, and location (urban or rural).

Reported premiums are again transformed based on equation 2. For decomposed gender wage premiums by industry of employment, equation 3 was used with an interacted dummy variable indicating the gender and industry of the employee.

Public Sector Wage Bill

Indicators on the relative size of the public sector wage bill are sources from the IMF's Government Compensation and Employment 2016 dataset. The wage bill is defined as the total compensation (in cash or in-kind) payable to a government employee in exchange for work. Wage bill includes wages and salaries, allowances, and social security contributions made on behalf of employees to social insurance schemes (IMF 2014). The IMF provides a detailed explanation of the construction of the indicators and the suggested caveats for using the cross-country analysis data (IMF 2016). It notes that the measurement of the wage bill might differ depending on the coverage, definitions, and different ways of public service provision:

- The base of the wage bill may vary considerably across countries. While high-income countries prefer expressing wage expenditure on an accrual basis (including an

imputation for the difference between the current period pensions and the contributions paid for these benefits), the rest prefers cash.

- Recording of benefits and bonuses (sometimes recorded as expenditure in goods and services), unit of measurements (number of employees versus full-time equivalents), and the definition of employment (permanent versus temporary employees) might essentially lead to different wage bill calculations.
- Issues of comparability could also arise by the different ways in which governments provide public services. For example, in France, most healthcare professionals are government employees. While in the Netherlands, they are contractors whose compensation is classified under goods and service expenditure instead of compensation of employee.

Final Selection and Exclusion of Unexplained Outliers

While the pre-screening ensures that the surveys selected meet a certain threshold of quality for inclusion, a second set of checks are employed on the resulting estimates to identify outliers. While outliers may be a result of natural heterogeneity between countries, these could also result from incorrect measurements or sampling errors that skew the sample distribution away from the population mean. Removing these are essential to reducing error variance, and since these are expected to be distributed non-randomly, they can decrease normality. This was done using a three-step process described as follows:

- Observations located more than three standard deviations away from a country's mean were marked and removed for countries with four or more surveys between 2000 and 2018.
- The above does not work for countries with fewer observations since the standard deviation expands mechanically to account for the variation. Therefore, observations that represent significant structural breaks from an overall trend of the indicator were identified and removed.
- Additionally, for countries with fewer than four observations, outliers were identified based on being structural different from the Region and income category of the country as defined by the World Bank.

3. Main Findings

This chapter highlights several cross-national and temporal stylized facts on public sector employment and compensation emerging from the WWBI. All cross-sectional figures use the latest available indicator for each country. Figures presenting time-series estimates include data for the indexed years. Thus, there may be large differences within these two sets of figures.⁷ Additionally, in the construction of figures that incorporate other data sources (e.g., national incomes), these data are sourced for the same year as the year of observation included from the WWBI. The full dataset, including an online data visualization dashboard, can be found [here](#). The dataset, a detailed explanatory note, and codebook are publicly available in the World Bank Data Catalog [here](#). The entire Stata code used in cleaning and estimation for the dataset have been archived on GitHub [here](#).

Demographics of the Private and Public Sector Workforces

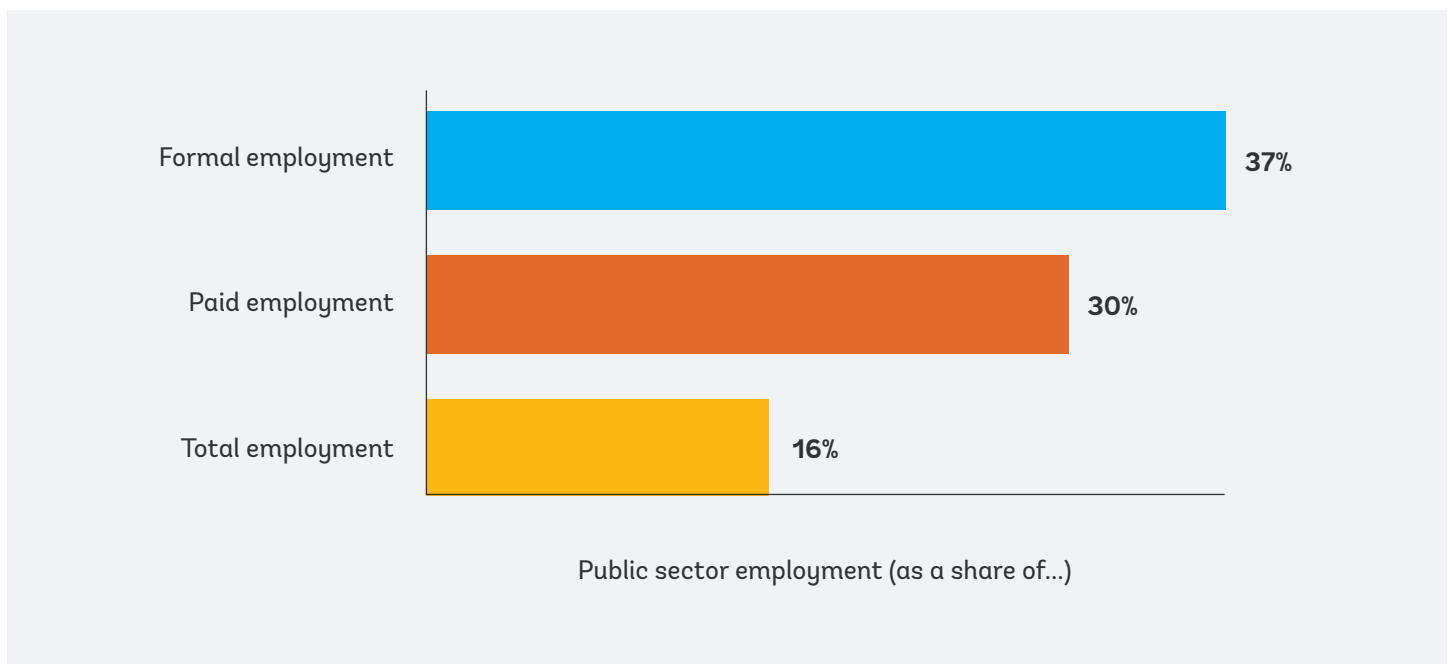
Is the public sector over-, under-, or adequately staffed? A key dimension of diagnostic assessments of the public sector involve identifying whether the levels and distribution of the public sector workforce is in line with the asks on the public sector such that there is neither over- nor under-staffing and that the right type and number of staff are employed in the right positions. Important metrics in assessing aggregate staffing levels are public sector employment as a share of total; paid (i.e., those working for wage labor, which excludes self-employed workers); and formal sector paid employment (those possessing a formal job contract or receiving benefits including pensions). Total employed individuals are defined as those workers, aged 15 and older, who in the respective household surveys responded as having a job in the prior week. Paid employees only include those among them whose basic remuneration is not directly dependent on the revenue of the unit they work for and are instead paid in wages and salaries, piecework, or in-kind, and therefore, exclude self-employed workers. Further, formal wage employees include only those among paid employees who also possess either a formal employment contract or receive some form of social security benefits, such as health insurance, pensions, or union membership.

7. For transparency, figures in the report mention when the underlying data identified are sourced from multiple years.

Relative Size of the Public Sector Workforce

The public sector is a major source of employment in most countries. The public sector is often the single largest employer in most nations. Using the latest available information for the countries included in the WWBI, the public sector accounts for, on average, 16 percent of total employment and over 30 percent and 37 percent of the paid and formal sector employment, respectively (see figure 2). The first metric measures the overall labor market footprint of the public sector. The latter two are better measures of the public sector's size in the salaried and formal subset of the labor markets which are more comparable to public sector employment. For instance, the difference between the relative size of the public sector as a share of total, as opposed to paid employment, is primarily due to the inclusion of non-paid or own-account employees, employers, and self-employed individuals in the former, all of which are almost entirely absent from the public sector workforce. Similarly, the fact that the size of the public sector as a share of formal employment is roughly 8 percentage points larger than its share of paid employment is due to the lower penetration of formal contracting for paid jobs or the absence of social safety nets in many developing countries. However, the above comes with the obvious caveat that since figure 2 is based on the latest observations per country present in the WWBI combined with an uneven coverage over years, these statistics are based on multiple years of data.

FIGURE 2 - The Public Sector Is a Large Employer Globally

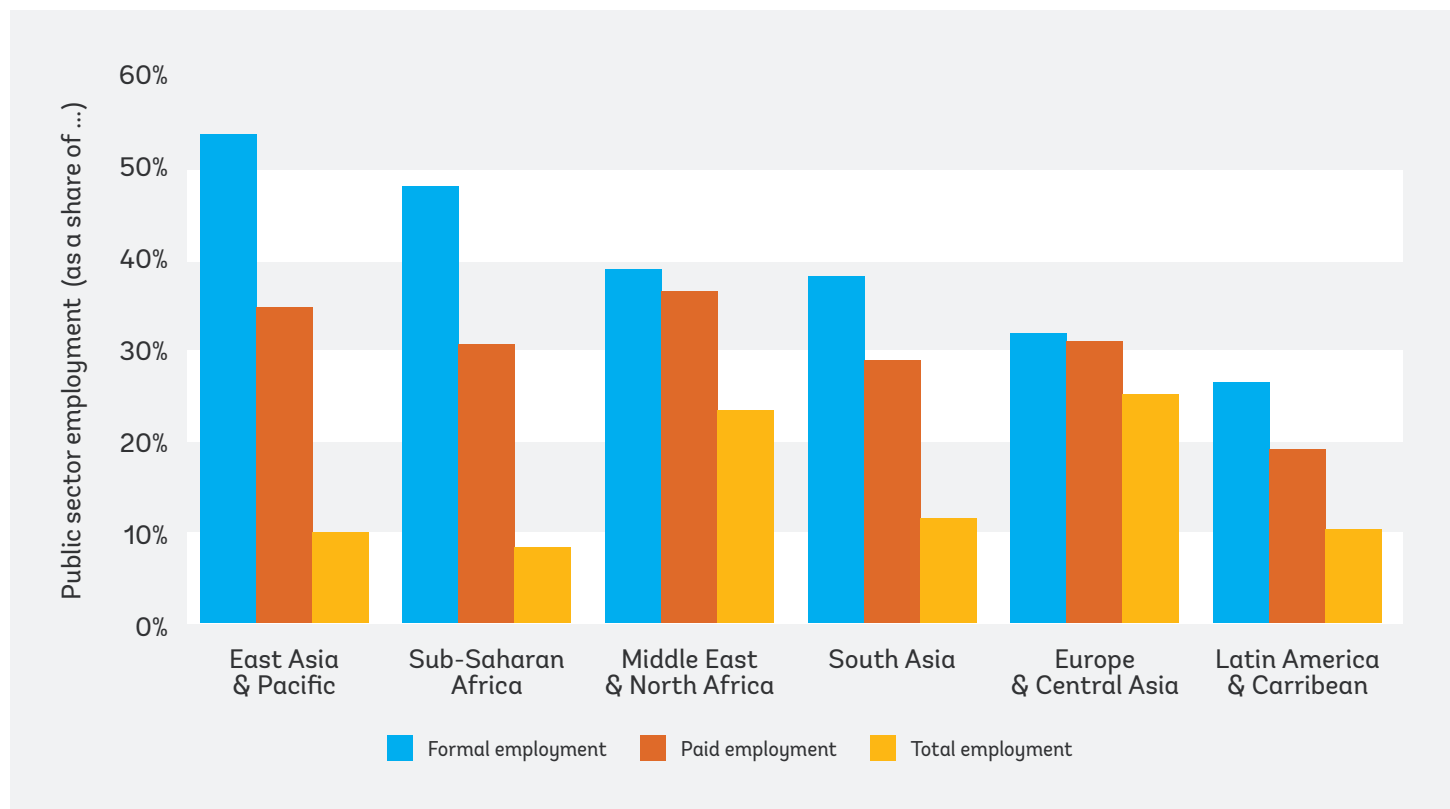


Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

The size and importance of the public sector varies extensively by country income and Region. While less than 9 percent of the total labor force of the average nation in the Sub-Saharan Africa Region is employed in the public sector, the public sectors of the nations in the Middle East and North Africa Region employ, on average, a quarter of the entire labor force (figure 3). Similarly, not only does the size of the public sector formal employment vary by Region, but so does its relative importance. While the public sectors of countries in East Asia and Pacific, South Asia, and Sub-Saharan Africa employ a much larger percentage of their formal workforce compared to their paid workforce, these

ratios are roughly identical in Middle East and North Africa and Europe and Central Asia. This difference in the relative size is due to higher penetration of formal contracting, near-universal access to social safety nets, or a lower level of undeclared work within the private sectors of countries within these Regions. This further underscores the important role that the public sector plays as a source of good stable jobs in many developing countries. While there may not be universal targets for adequate employment among countries, the indicators included in the WWBI allow countries to benchmark against peer countries using these globally harmonized metrics.

FIGURE 3 - The Size of the Public Sector Varies Significantly by Region

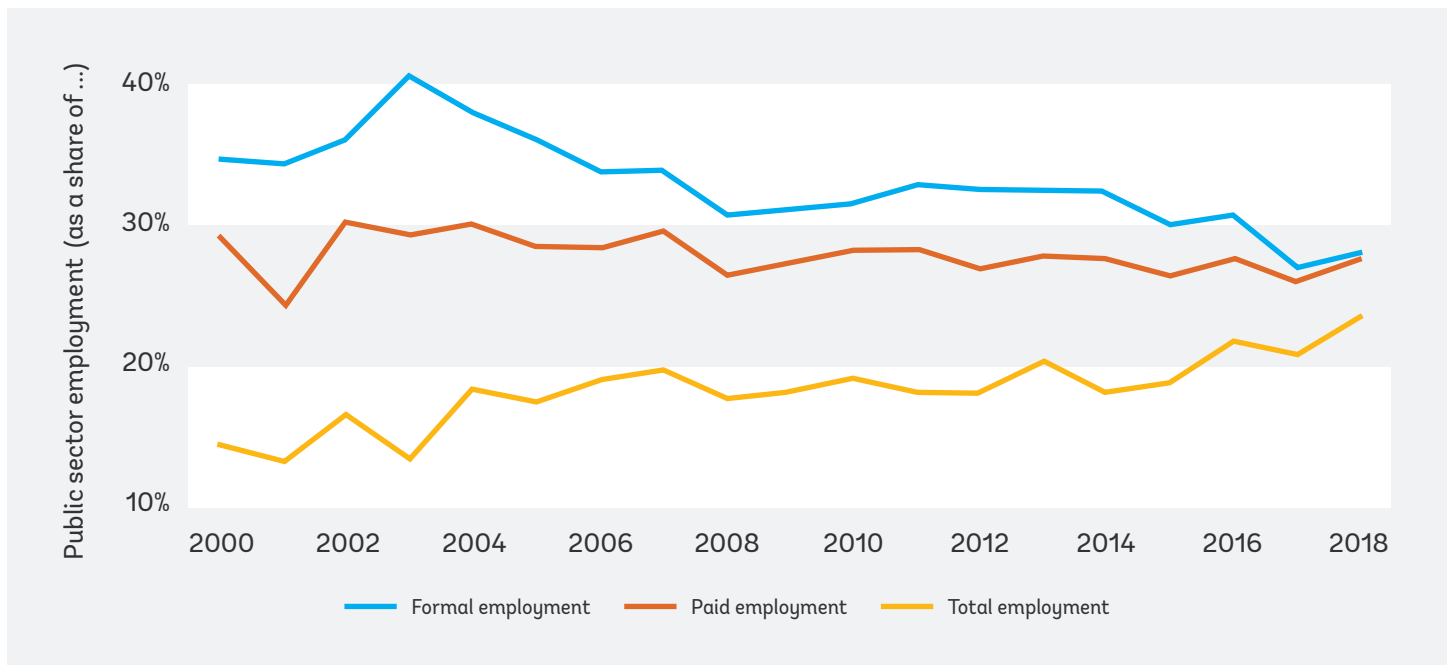


Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

There has been a trend toward convergence in the relative size of the public sector footprint in the total and formal labor markets between 2000 and 2018. While the relative size of the public sector within total employment has increased, public employment as a share of formal employment has steadily declined over the 18-year period (figure 4). Moreover, while regional differences persist, there has been greater similarity in the share in recent years. In 2000, public sector employment accounted for over 54 percent of formal employment in the Sub-Saharan Africa Region and almost 31 percent in the Latin America and the Caribbean Region, respectively. In 2018, public sector formal employment in these two Regions stood at 22 percent in Sub-Saharan Africa and 23 percent in Latin America and the Caribbean, respectively. The departure from the headline estimate presented in figure 2 is due to the uneven coverage of the WWBI across years.

Figure 2 sources the latest observations by country from various years. This convergence in the public sector’s share of the total and formal labor force is in part due to greater demands on government services as countries develop and in part due to increased penetration of formal contracting and the presence of social safety nets within the private sector over the period. This argument is further strengthened by the fact that the relative importance of the public sector within formal employment fell faster and further in many middle-income countries than in high- or lower-income countries, both of which experienced relatively slower rates of growth of labor force productivity and per capita incomes (Cho et al. 2012). Further, while WWBI’s access to underlying labor force survey data differs by year, this trend is consistent even for Regions with stable long-term coverage, such as Sub-Saharan Africa and Latin America and the Caribbean.

FIGURE 4 - Sizes of the Public Sector Workforce and Formal Employment Converge over Time



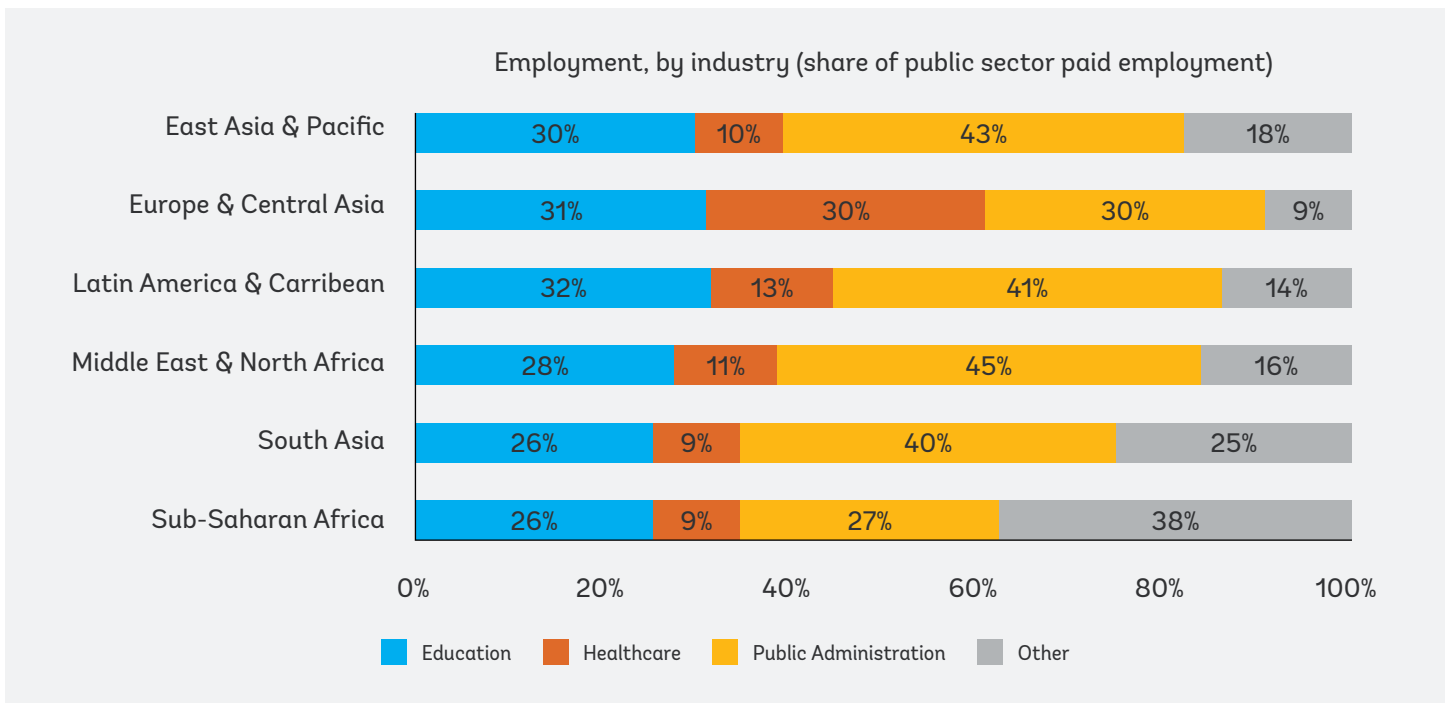
Source: Worldwide Bureaucracy Indicators, 2000-2018.

Composition of the Public Sector Workforce

Globally, public administration is the single largest segment of the public sector paid workforce. Countries have unique legal and occupational classifications of public sector employees that make cross-national comparisons difficult. In many countries, all employees are classified as civil servants, meaning they enjoy distinct legal protections. In other countries, only management and policy staff are civil servants, and other staff, particularly service delivery staff, have fewer privileges and are governed by the labor code similar to formal private sector employees. WWBI’s reliance on survey data uses internationally accepted standard industry and occupational classifications and therefore allows for cross-national comparisons and finds that public administration (which includes individuals responsible for the general administration of the government; the provision of defense, justice, police, and foreign affairs; and the management of

compulsory social security) is the single largest component of public sector workforce in most countries (figure 5). Using the latest available observation for all countries, on average, 35 percent of the public sector workforce is employed in public administration, followed by the education and healthcare sectors which employ, on average, 30 percent and 19 percent of the public sector workforce, respectively. Together these three industries account for over 80 percent of all public sector employees. “Other” accounts for public sector employment in all remaining walks of economic activity, ranging from construction and infrastructure, the provision of public utilities, or workers engaged in SOEs that are not classified under public administration, education, or healthcare provision. While there may not exist a universal formula for the ideal makeup of the public sector workforce, countries are now able to benchmark against peer countries or historically to see how their respective public sector workforce has been evolving over the past two decades.

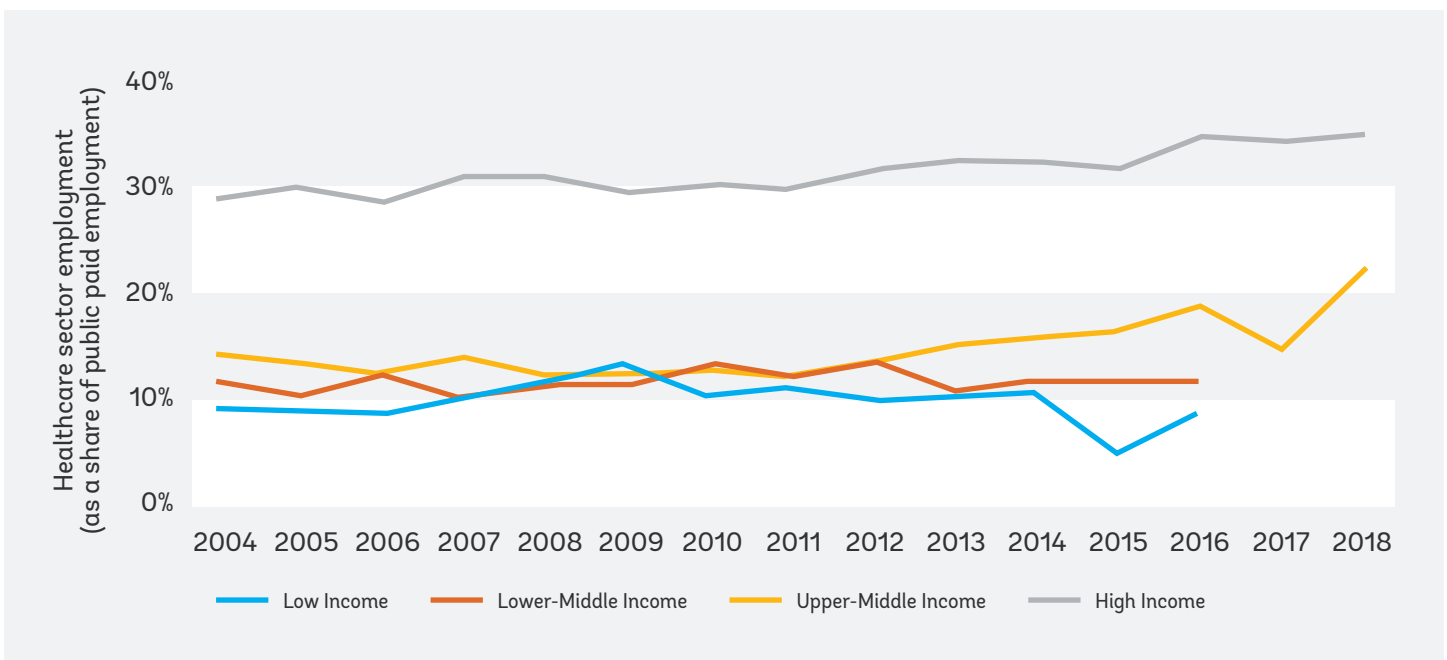
FIGURE 5 - Public Administration Is the Largest Segment of the Paid Public Sector Workforce



Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

Over time, a gradual increase is seen in the relative share of the public sector workforce employed in the healthcare sector within certain countries. Beginning in 2004 (where data coverage across countries is more representative of the global average), on average 18.5 percent of the public sector paid workforce was employed in the healthcare sector. However, there were large differences between countries. Within high-income countries, almost 29 percent of the public sector paid workforce were healthcare sector employees compared to less than 9 percent in low-income countries (figure 6). By 2018, over a third of the public sector paid workforce in high-income countries was employed in the provision of healthcare. Similarly, the share of healthcare workers in the upper- middle-income countries increased by almost 60 percent to 22.6 percent in 2018. However, during this same period, low and lower middle-income countries did not experience any noticeable increase.

FIGURE 6 - The Size of the Public Sector Healthcare Workforce Increased in Some Countries

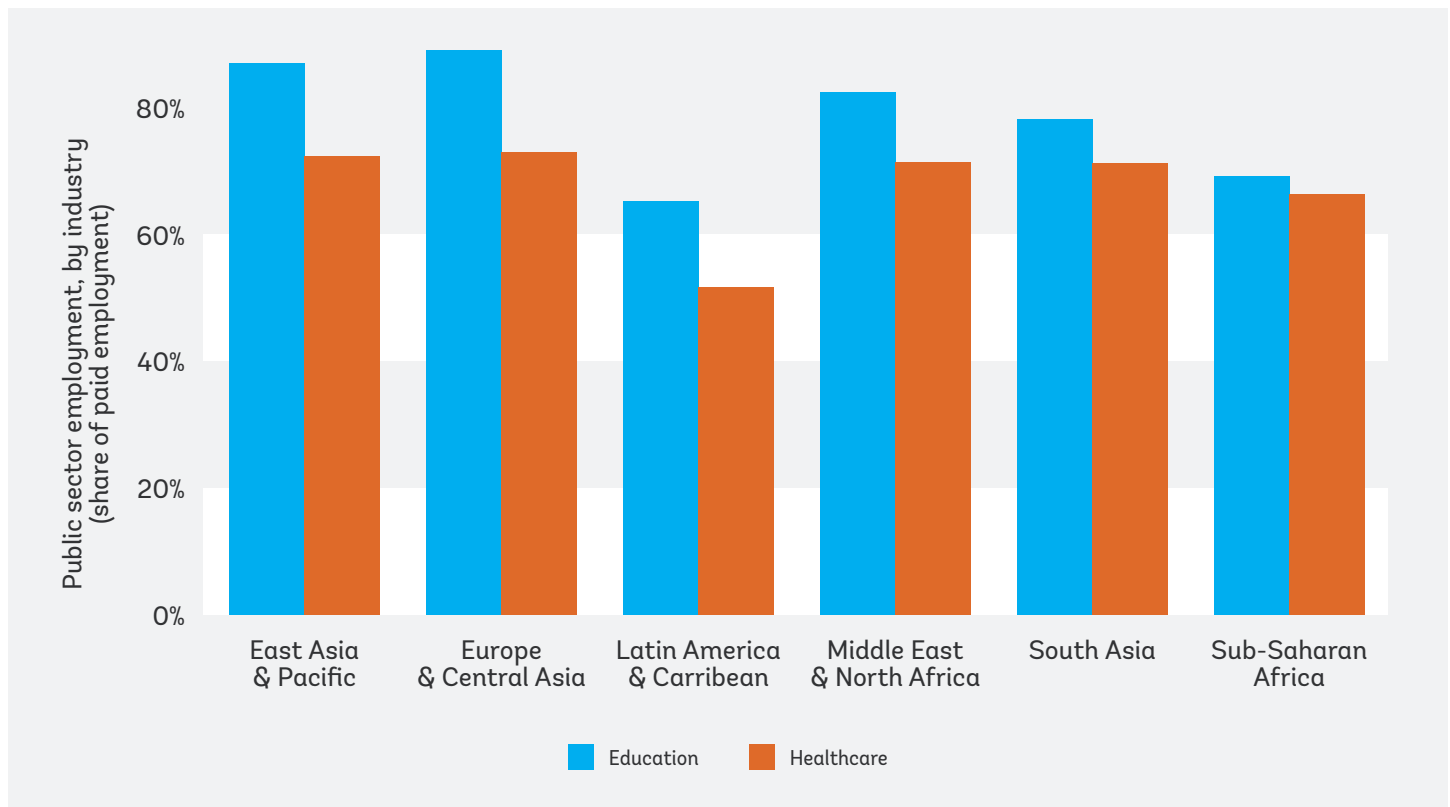


Source: Worldwide Bureaucracy Indicators, 2000-2018.

The education and healthcare segments provide critical services, and much of the provision takes place in the public sector. Over three-fourth and two-thirds of the education and healthcare paid workforce are, on average, employed in the public sector, respectively (figure 7). The education and healthcare staff have been central to the relative success of countries in meeting the targets set out in the Sustainable Development Goals for universal health coverage and literacy. Recently, however, both sectors have seen significant attention as essential workers in the aftermath of the COVID-19 pandemic. Frontline education and healthcare providers, academics and researchers, epidemiologists, public health experts, and engineers have been an essential bulwark against the public health crisis and their importance

and contribution cannot be overstated. The WWBI can shed light on the immense role that the public sector education and healthcare workforce specifically plays within these two sectors. The WWBI finds substantial variation by Region. While over 91 percent of the education and 73 percent of the healthcare workforce in the Europe and Central Asia Region is employed in the public sector, countries in Latin America and the Caribbean employ just under 66 percent and 52 percent, respectively. While organizations, such as the OECD and the World Health Organization, have developed standards for the appropriate ratio of education and healthcare workers to serve a local population, the WWBI offers a window into estimating both cross-nationally as well as within-country due to its longitudinal coverage.

FIGURE 7 - Most Education and Healthcare Workers Are Employed in the Public Sector



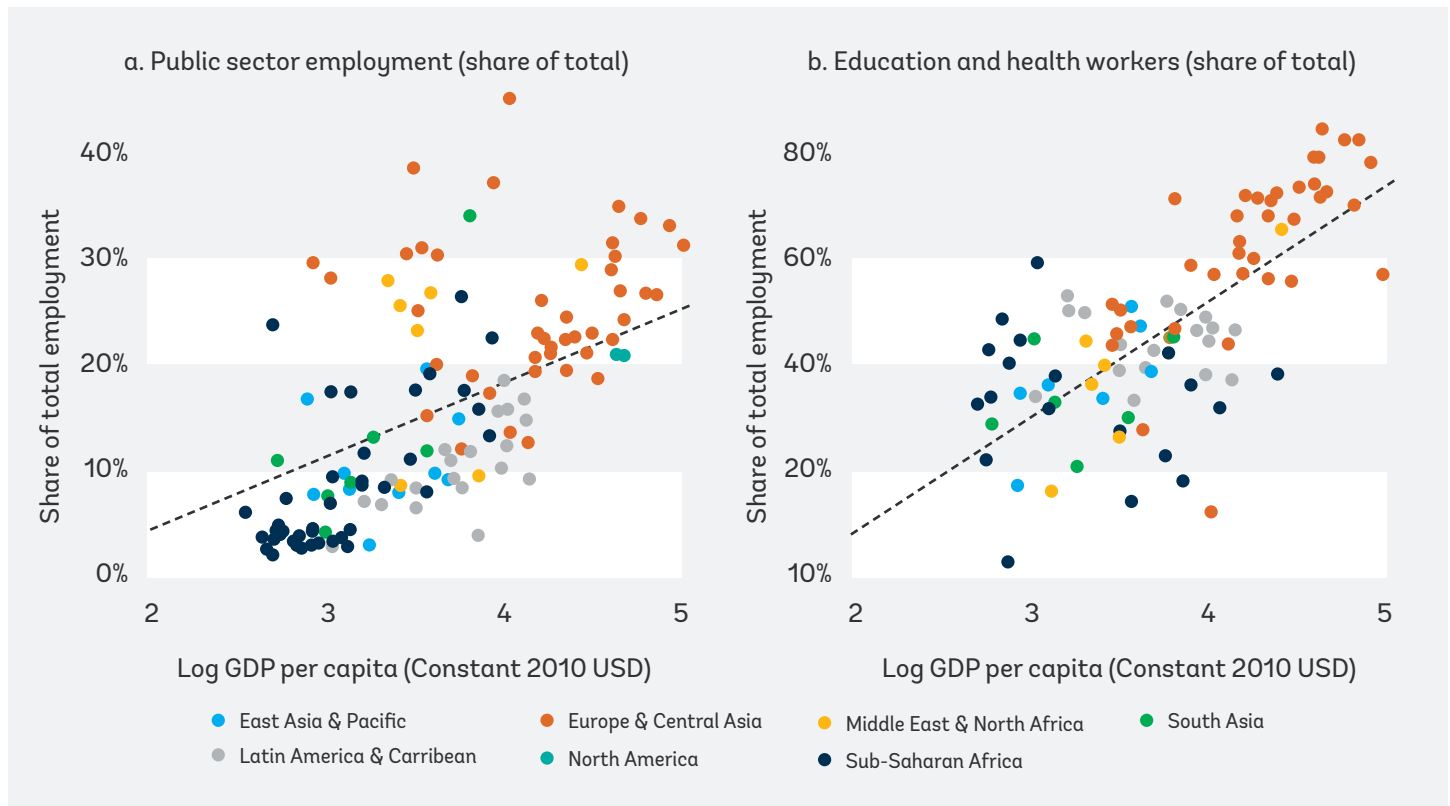
Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

Cross-nationally, the relative size of the public sector within total employment and the share of the public sector devoted to the provision of social services rise with the level of economic income. Globally, the public sector's share of total employment ranges from less than 2 percent to over 44 percent (figure 8a). Countries in Europe and Central Asia have some of the largest public sectors, while in countries in Sub-Saharan Africa, the public sector has the smallest relative labor market footprint. This positive relationship between the size of the overall public sector and economic prosperity (referred within public economics as Wagner's Law) in its simplest form argues that as countries develop, their government needs to perform greater functions, particularly social services. This is further evidenced by the positive relationship between country income and the share of the public sector workforce that is dedicated to the provision of education and healthcare (figure 8b). Over 80 percent of all public sector workers in Denmark, Finland, and Switzerland are employed within the education and healthcare sectors, compared to The Gambia, where these segments employ about 4 percent of public sector workers. As countries develop, the relative share of public administration employees in the public sector workforce gets smaller as the healthcare and education workforce becomes relatively larger

segments of the public sector workforce. There is, however, no discernible relationship between country income levels and public sector employment as a share of salaried employment, which suggests that the public sector grows along with the formal private sector.

While this hypothesis may be at work globally, individual country circumstances warrant closer scrutiny as other factors may be at work. For example, the size of the public sector is also historically sticky as it may be a result of determined economic policy as opposed to a sustained increase in the demand for greater public services that accompany economic development. For example, four upper-middle-income countries (Botswana, Jordan, the Russian Federation, and South Africa) have some of the smallest shares of public sector workforce engaged in education or healthcare provision. Additionally, the displacement effect hypothesis argues that increases in government spending over time may be due to periods of crisis when public spending (including the public sector wage bill) expands in a countercyclical manner but does not adjust downward after the crisis (Peacock and Wiseman 1961; 1979).

FIGURE 8 - The Public Sector's Size and Organization Correlate with Country Incomes

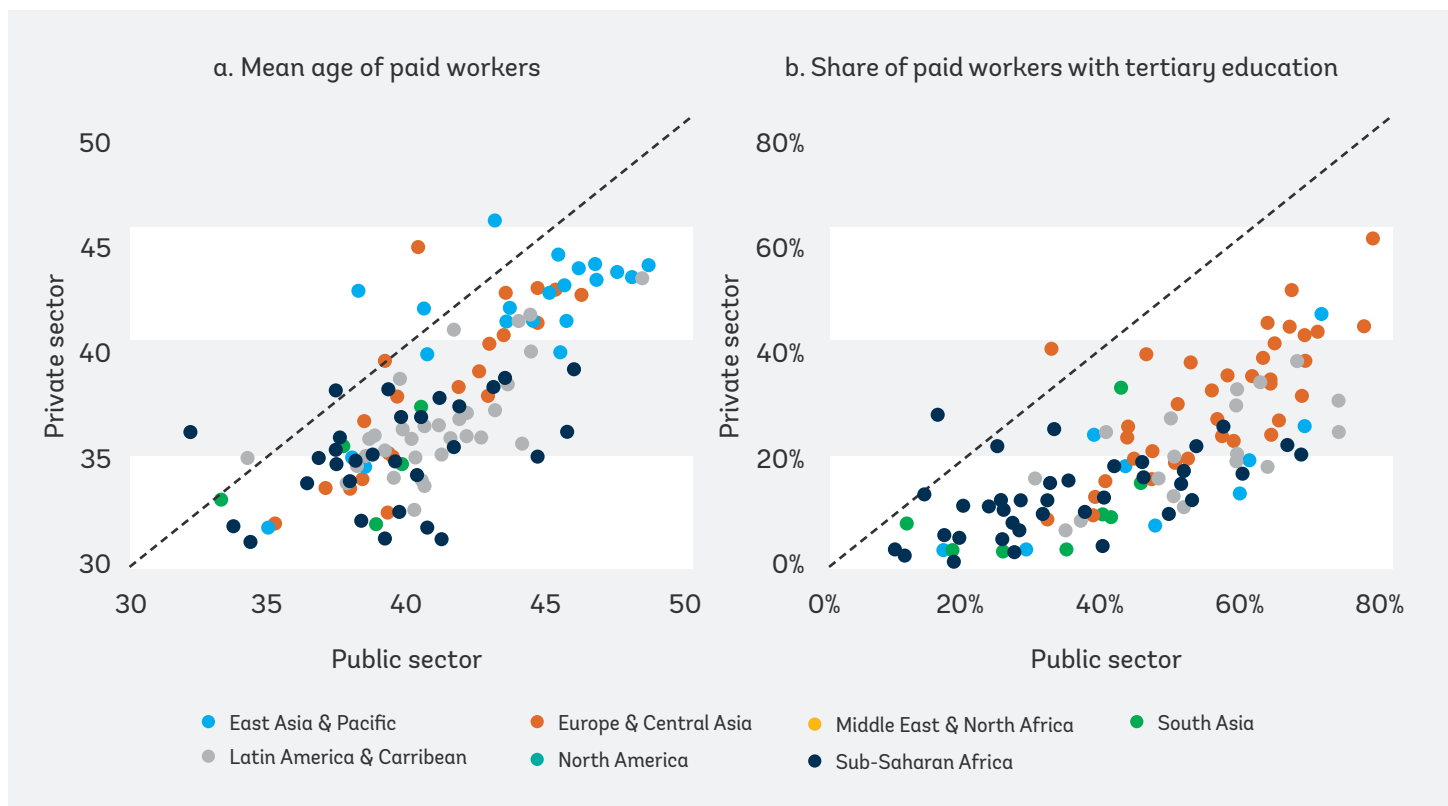


Source: Worldwide Bureaucracy Indicators, World Development Indicators, latest observations per country (multiple years).

Public sector Public sector workers are older and more educated than private sector wage workers. In both panels of figure 9, the dotted line denotes symmetry between the two axes. Countries largely cluster below the 45-degree line in both figures, signifying that the public sector workers are, on average, over four years older than their private sector counterparts (figure 9a). The age, grade, and seniority profile of public sector workers can point to skills gaps. For example, prolonged periods of hiring freezes or disruptions to recruitment because of conflict can result in missing cadres, as was the case in Cameroon and Sierra Leone. Another problem is a large proportion of older workers, as in the Democratic Republic of Congo, where the inability to finance pensions has meant that many retirees stay on the payroll. An aging public sector workforce is also a problem in high-income countries. In Romania, for example, 30 percent of public employees are approaching retirement in the next 10 years, which can have implications for both staff motivation and productivity, and fiscal sustainability given the growth in pensions expenditures (World Bank 2019).

The public sector has a higher proportion of workers with tertiary levels of education. Forty-seven percent of public sector workers have a tertiary degree compared to 21 percent in the private sector (figure 9b). These systematic differences between public and private sector workers have implications for any comparative analysis between the two labor markets, especially public-private wage differentials. Additionally, the proportion of public sector workers with tertiary education varies by country income levels. In low-income countries, 19 percent of the public sector workforce has either primary or no formal education qualifications, with the proportion rising to as high as 40 percent in some cases. High proportion of low-skilled workers points to the public sector serving a social welfare function and points to potential fiscal savings without compromising public sector productivity by outsourcing of some elementary functions. A corollary to this high proportion of low-skilled workers is a high proportion of clerical or support jobs where a functional review of Serbia's executive branch found a third of all positions were internal administrative support, such as information technology, human resources, legal, estates, communications, procurement, knowledge management, and finance (World Bank 2016).

FIGURE 9 - The Public Sector Workforce Is Older and Higher Levels of Education

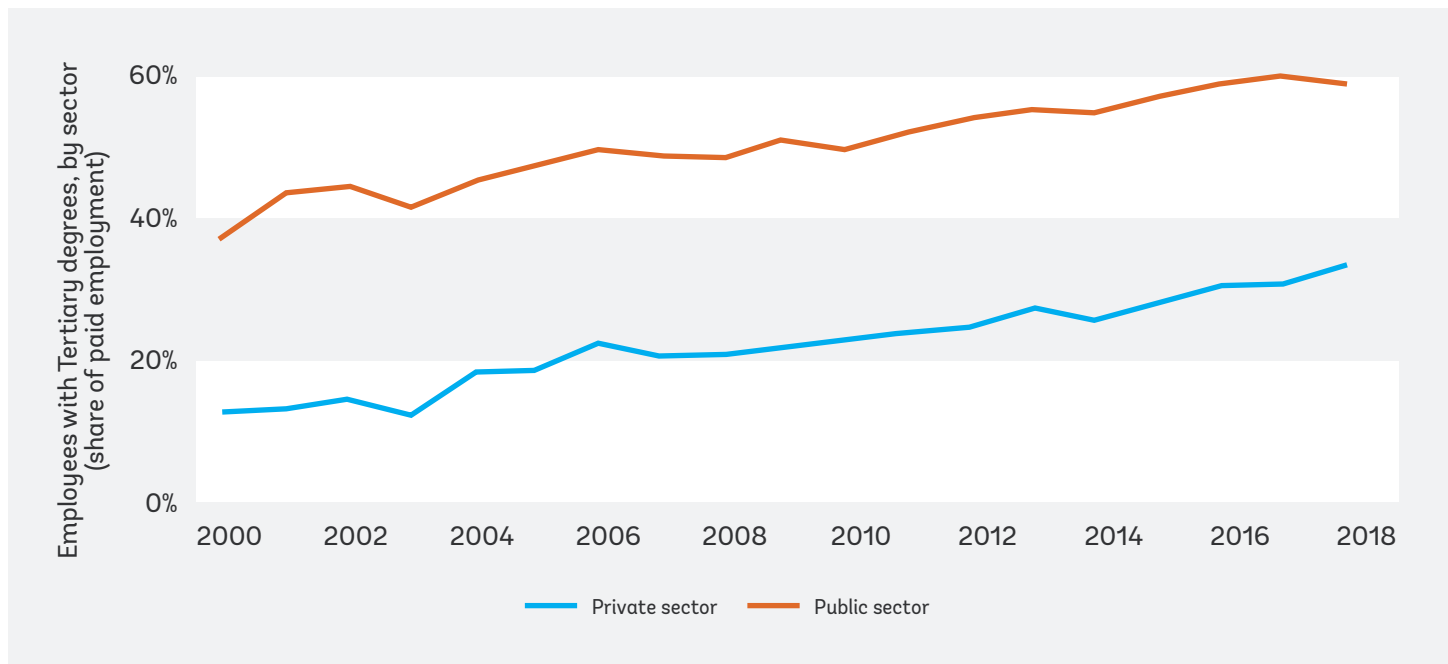


Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

Globally, more educated people continue to prefer the public sector over the private sector. While the share of employees with a tertiary degree has increased around 20 percentage points in both sectors, the public sector has continued to employ more workers with higher educational attainment. In 2018, almost 60 percent of the public sector workforce had a tertiary degree, almost twice as much as the private sector. This gap in the educational qualifications between public and private sector workers has remained roughly steady since 2000 (figure 10). There is a growing literature on the private and social return of educational

attainment, yet much of it is silent on whether the returns of additional schooling (especially for tertiary education) differ between the public and the private sector (Patrinos 2016). However, nascent research on the topic finds a higher return to additional years of schooling in the private sector—compared to the public sector—given the higher returns for productivity in the private sector (Psacharopoulos and Patrinos 2018). This finding helps further cement the higher predictive capabilities of intrinsic factors, such as job security, public service motivation, or reputation, for explaining the choice between the public and private sectors (Frey 1997).

FIGURE 10 - The Public Sector Continues to Attract More Educated People



Source: Worldwide Bureaucracy Indicators, 2000–2018.

Gender Equity in the Public Sector

The public sector is a more important source of employment for women than the private sector. The public sector’s large labor market footprint means that it can be a strategic leader in changing norms and behaviors and promote greater equality in employment in the overall labor market. In many developing countries, the public sector in general and the education and healthcare sectors in particular have a long history of being two of the few options for employment available to females (Yassin and Langot 2017). Globally, females represent 46 percent of the public sector workforce compared to 33 percent in the private sector (figure 11). While men outnumber women in the private sector in all 130 countries for which data are available, women outnumber men in the public sector in 55 countries. Additionally, countries generally cluster by regional groups, with 36 countries in Europe and Central Asia employing more women than men in the public sector. In contrast, only 27 percent and 29 percent of the paid public sector workforce in South Asia and the Middle East and North Africa are female, respectively.

FIGURE 11 - The Public Sector Employs More Women than the Private Sector

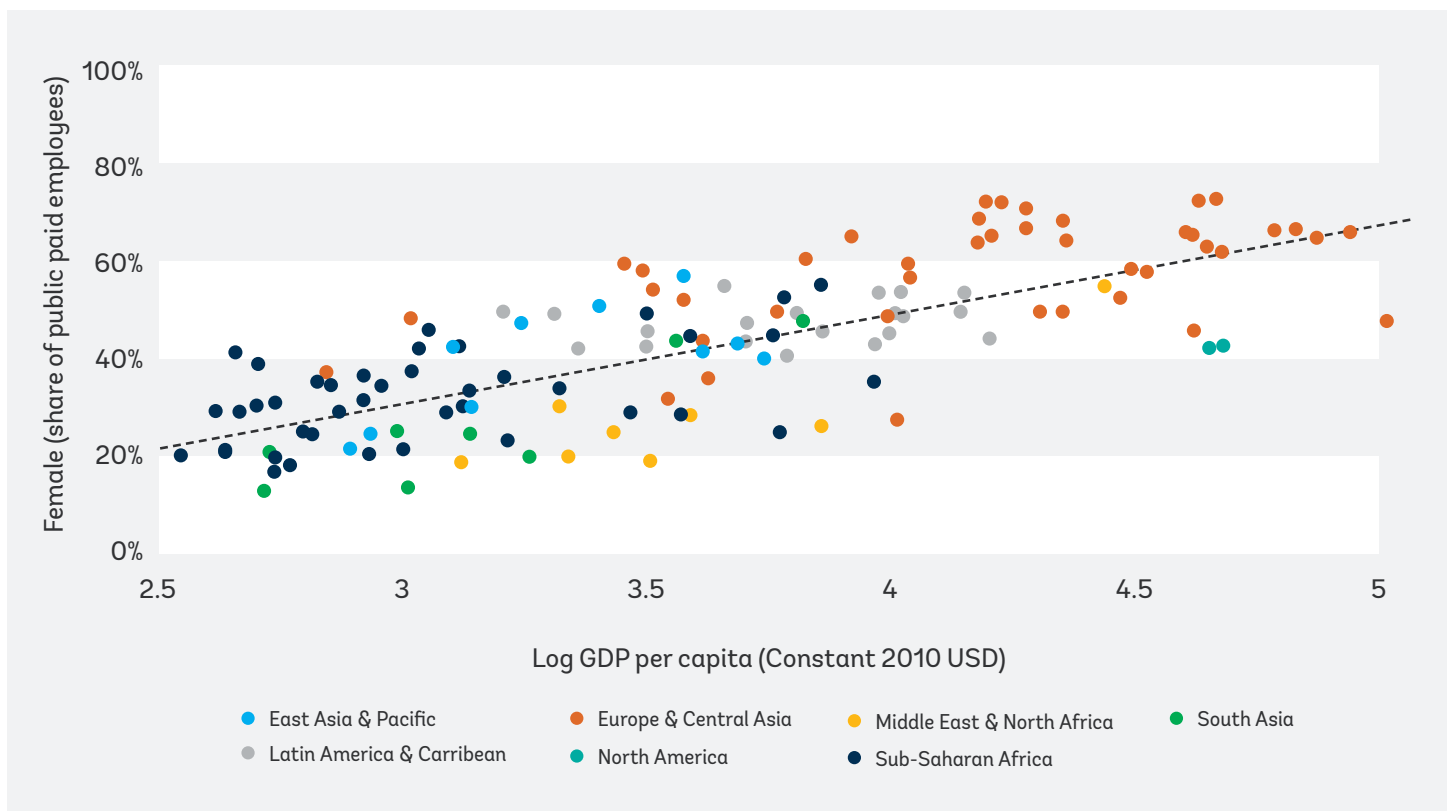


Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

Female representation in the public sector is strongly correlated with country incomes (figure 12). A large body of literature finds a U-shaped relationship between female employment in the private sector and economic development (Goldin 1986, 1995; Jayachandran 2020). However, the companion literature on the female participation rates in the public sector remains lacking. The WWBI provides forays into this literature by showing a positive and significant relationship between female participation in the public workforce and

country income. While multiple factors influence female participation rates in the labor force, other studies confirm the positive relationship between fostering more representative bureaucracies (including through female participation) and improved social and economic outcomes across a wide spectrum, including reductions in gender-based violence (Johnston and Houston 2016) and improvements in student performance (Zhang 2019) and public sector productivity (Park 2013; Andrews et al. 2005).

FIGURE 12 - Public Sector Gender Equity Is Correlated with Country Income

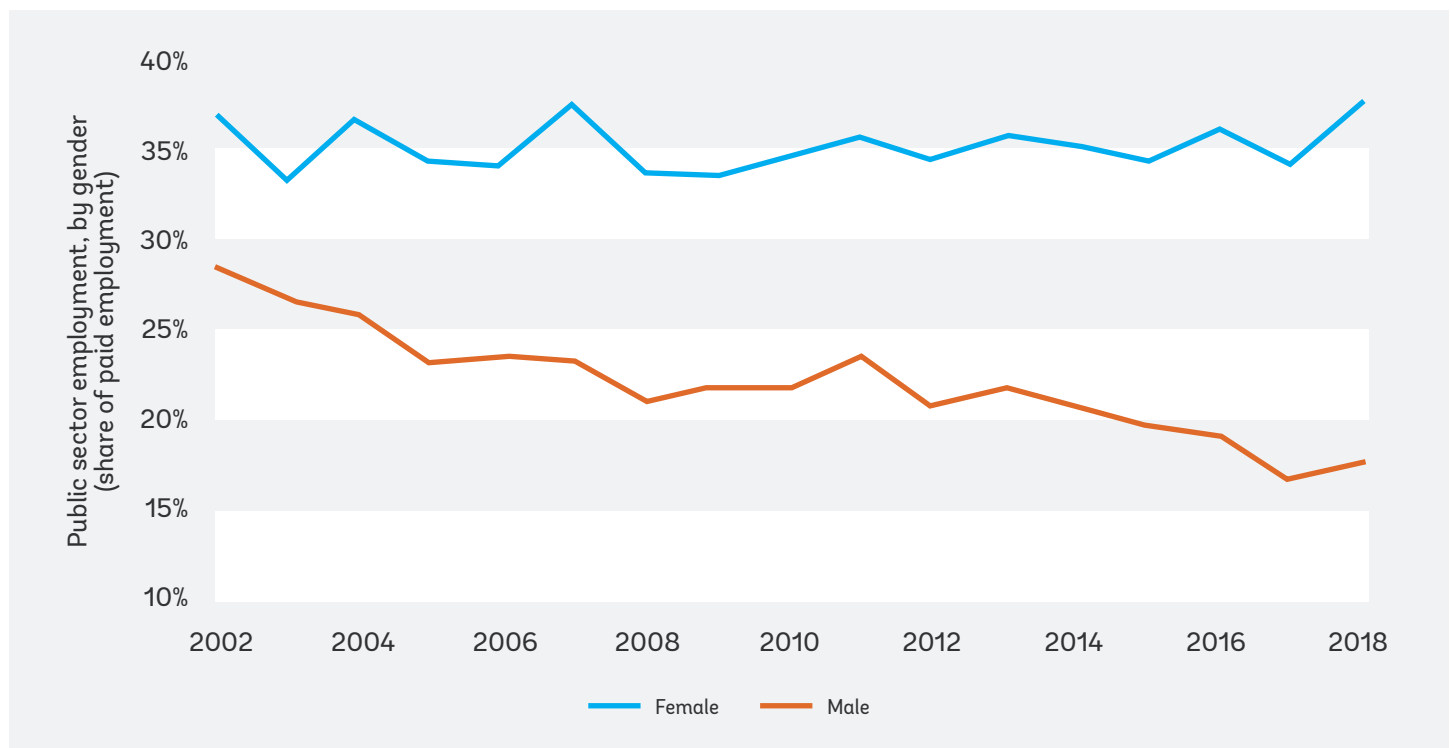


Source: Worldwide Bureaucracy Indicators, World Development Indicators, latest observations per country (multiple years).

Over the past two decades, women are increasingly choosing the public sector, while men are transitioning into the private sector. Globally, the public sector hires disproportionately more women than men (figure 13). Between 2000 and 2018, women’s public sector employment as a share of paid work has increased around 6 percentage points, while men’s employment has decreased by 7 percentage points. From a theoretical perspective, the gender bias in public employment results from a combination of demand- and supply-side factors and gender norms. Some of the well-

known factors contributing to higher female employment in the public sector are a lower gender pay gap and higher wages for women in the public sector (Gindling et al. 2020); better work and life balance for public sector workers (Nielsen, Simonsen, and Verner 2004); greater job security (Munnell and Fraenkel 2013); intrinsic preferences for public sector occupations (Lanfranchi and Narcy 2015); occupational segregation (ILO 2016); and less discriminatory hiring policies by gender (Gindling et al. 2020).

FIGURE 13 - Female Representation in the Public Sector Is Rising Globally

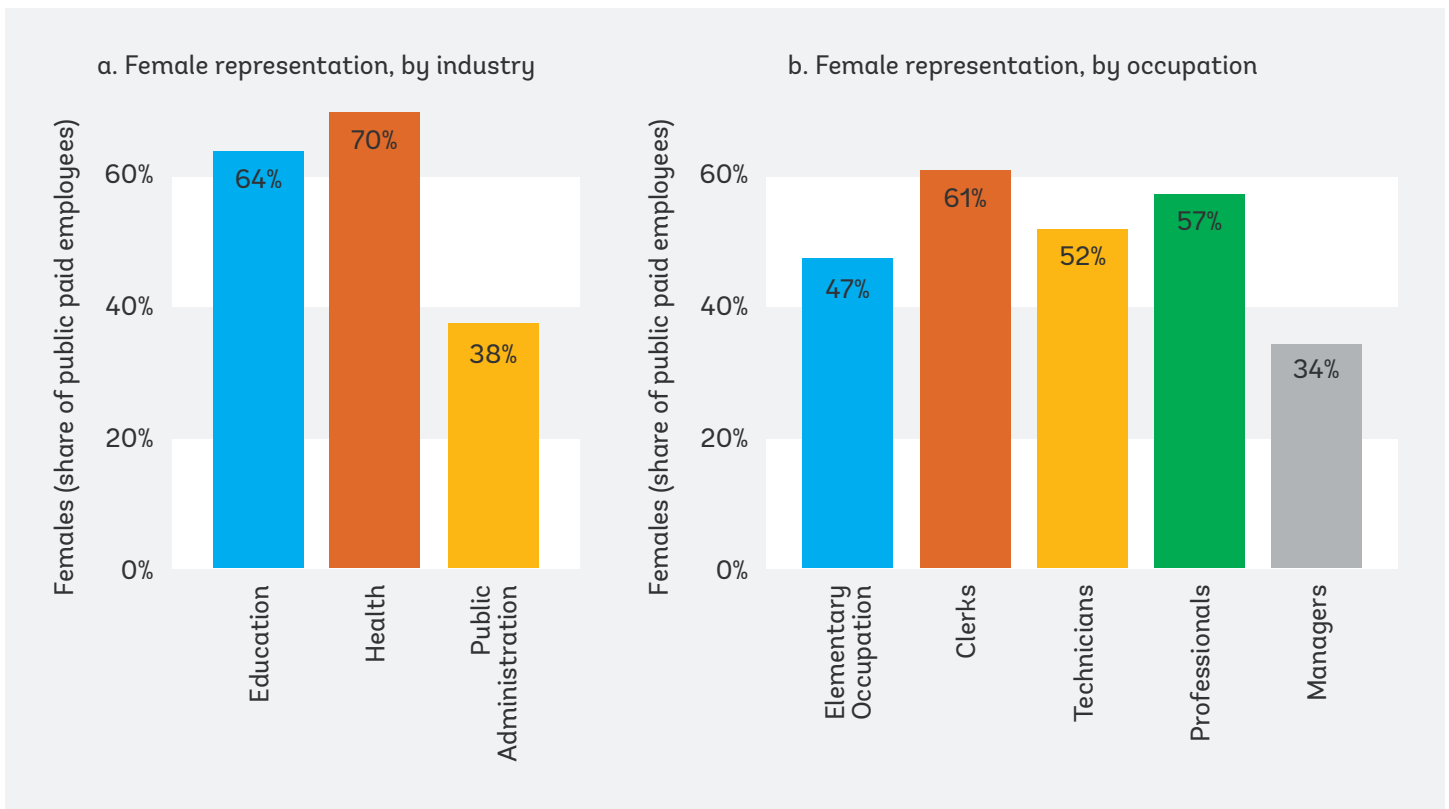


Source: Worldwide Bureaucracy Indicators, 2002–2018.

While most public sectors have higher participation by women, their representation is confined to a few industries and occupations. While the public sector is a large employer of women, there is considerable horizontal and vertical occupational segregation with women concentrated in certain industries and positions; over 64 and 70 percent of the public sector education and healthcare workforce are female, respectively. Comparatively, less than 38 percent of the public administration workforce is female (figure 14a). Additionally, women occupy around 38 percent of managerial positions in the public sector while representing almost 70 percent of clerical positions (figure 14b). A recent report confirms that women health workers are concentrated into lower-status

occupations, finding that while 84 percent of the 28.5 million nurses and midwives are women, they are still outnumbered by men in physician and specialist positions (Boniol et al. 2019). Although the reasons for this inequality in public sector employment are understudied, drawing on academic studies on the private sector, these likely include the differential caring responsibilities that limit women’s career progression; social norms and attitudes about what type of work women are more suited to; and biases in task assignments so that women are less likely to receive more visible and career-enhancing responsibilities (Crampton and Mishra 1999; Forret and Dougherty 2004).

FIGURE 14 - Female Representation in the Public Sector Is Concentrated in a Few Sectors



Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

Public Sector Wage Competitiveness

Public sector wages are an important determinant of personnel quality and motivation, and therefore, a key determinant of state capacity. However, answering this question requires an assessment of who makes up the appropriate comparator group for public sector workers. The first option is to directly compare the wages of public and private sector workers given that the most likely outside option to employment in the public sector is the private sector. Therefore, estimating public-private wage differentials offers the most natural comparison explored in a very large academic and policy literature. The second involves comparing the wages of public sector workers in one country with those in other countries. Given that these are the closest counterparts to one country's public sector workforce, this is an important method for estimating whether public servants in one country are over- or under-paid. These comparisons are particularly useful in the case of industries or occupations with transferable skills, such as healthcare workers who migrate internationally or workers in clerical or managerial positions who rotate within the public sector. A third option is to compare individuals performing different tasks or employed in different occupations within the same country's public sector. The first

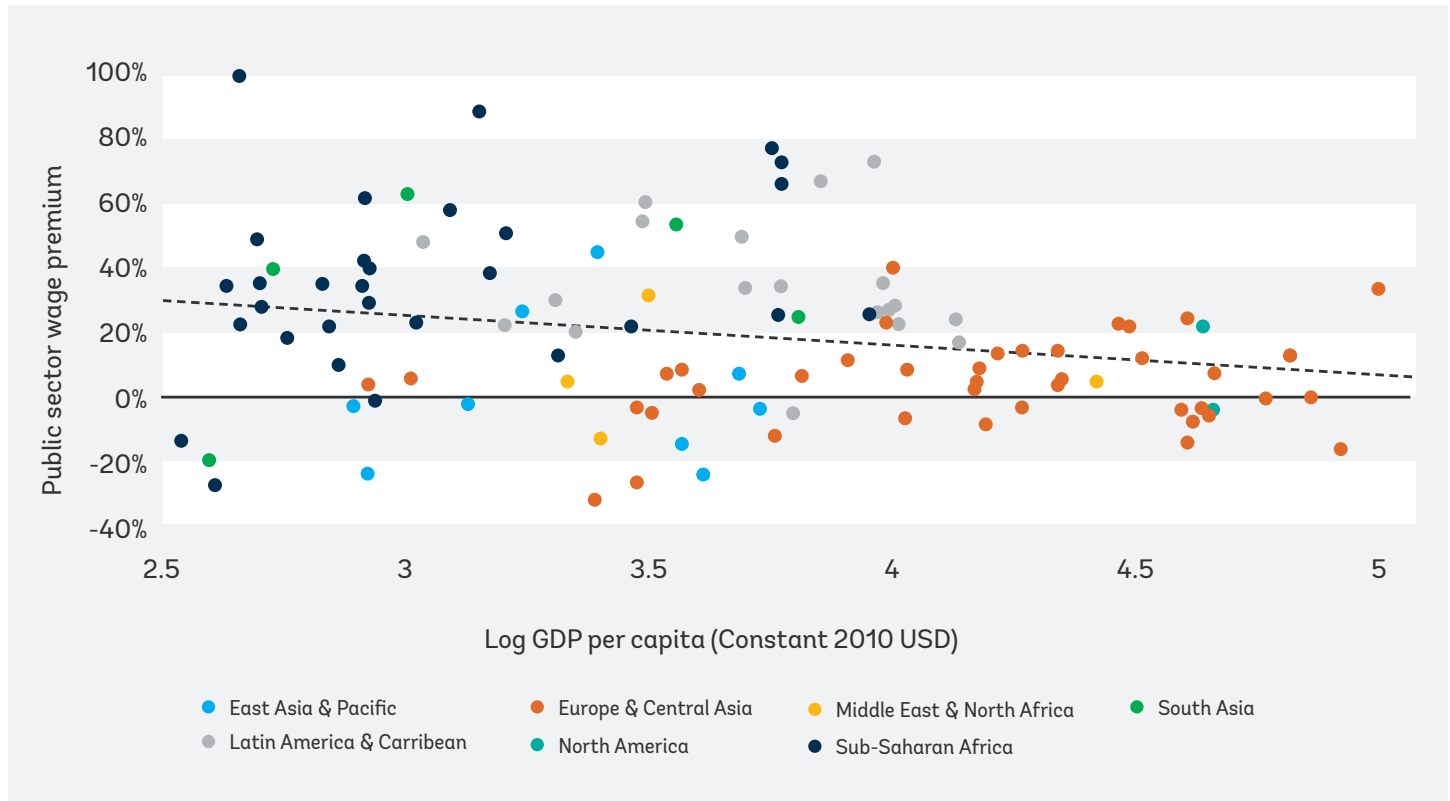
of these options is explored in this section, while the latter two are discussed in detail in the proceeding section.

Given the size of the public sector, public sector compensation should be designed in cognizance of its influence on the broader labor market. While public sector wage-setting mechanisms do not mechanically respond to market forces, they should be carefully designed to consider the distributional aspects of wages. Policy makers need to ensure that public sector wages remain competitive enough to attract and retain high-quality public sector workers. However, oversized public sector compensation policies can create disequilibria through queuing and crowding effects in the private sector labor market. Under an optimal compensation policy, public sector wages will be competitive without being distortionary, and there will not be any shortage of skills in either sector. The same principle implies that the wage premium should be annually monitored to ensure that no gap emerges between the public and private sectors due to wage rigidities in the public sector that can cause a departure from a theoretical optimum.

Public employees in most nations receive a wage premium compared to their counterparts in the private sector. Given the demographic differences of workers between the two sectors as presented in section 2.1, the WWBI approach provides an empirically robust and globally uniform measure of public-private wage differentials. Figure 15 shows the premium when the public sector is compared to all private sector salaried employees, irrespective of the type of job and controlling only for worker characteristics (including sex, age, levels of education, and location). Public sector workers

have approximately 19 percent higher basic wages (excluding allowances and bonus payments) across the 111 countries for which the World Bank has data, with 80 countries having a positive premium. There is considerable heterogeneity in the size of that premium across countries, varying from a penalty of 33 percent to a premium of 100 percent. The size of the premium is negatively correlated with country incomes, a finding corroborating academic studies that report higher premiums for developing countries (Finan, Olken, and Pande 2017).

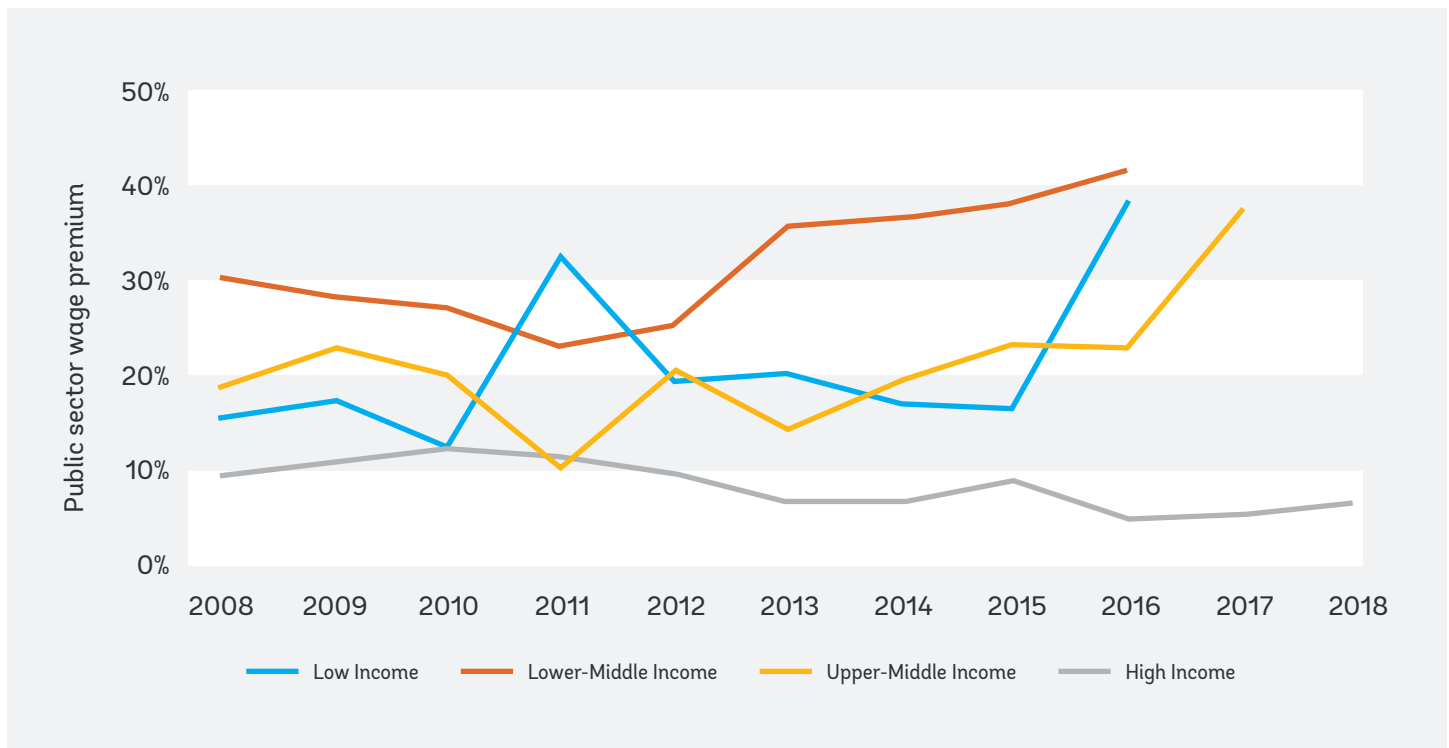
FIGURE 15 - Public Sector Workers Receive a Wage Premium Compared to the Private Sector



Source: Worldwide Bureaucracy Indicators, World Development Indicators, latest observations per country (multiple years).

Public sector wage premiums in low- and middle-income countries have been rising over the past decade. The public sector wage premiums have risen in developing countries over time while having fallen in developed countries. Between 2008 and 2018, the average public sector wage premium for low-income countries rose by over 140 percent. Lower-middle and upper-middle-income countries experienced comparatively more muted expansion in the public sector wage premium, recording 37 percent and 24 percent, respectively (figure 16). Moreover, the average wage premium within high-income countries experiences a protracted commutative decline measuring at just under 45 percent for the decade. While a large body of literature finds evidence of declining public sector wage premiums within developed country labor markets (Bender and Elliott 2002; Gibson 2009; Melly 2005), a similar literature on labor markets in developing countries finds that the increased vulnerability to instability and volatility result in higher and persistent wage premiums in the public sector in many developing countries (Barton, Bold, and Sandefur 2017; Miaari 2020).

FIGURE 16 - Public Sector Wage Premiums Have Risen for Developing Countries

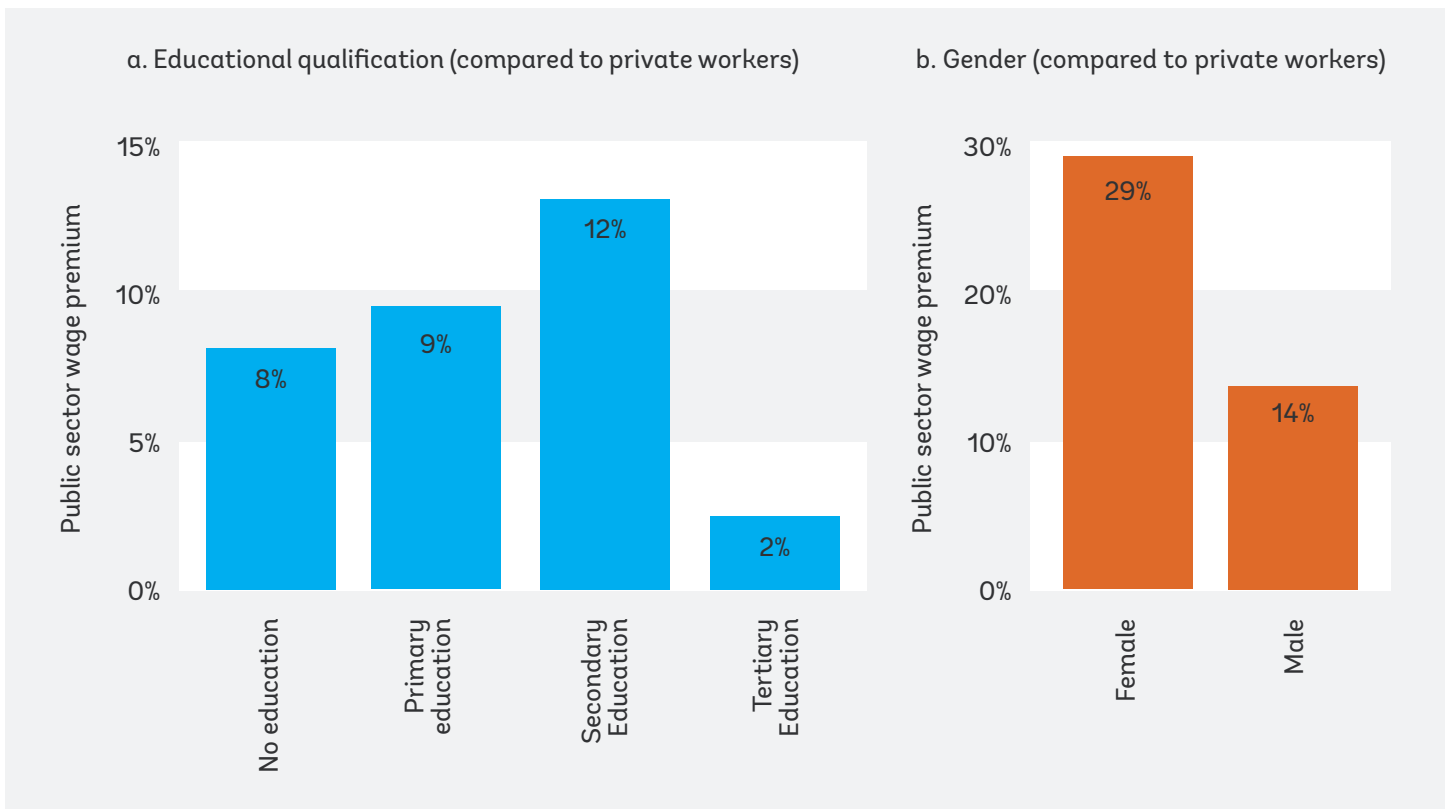


Source: Worldwide Bureaucracy Indicators, 2008–2018.

The public sector wage premium is not uniform and varies by personnel characteristics. The magnitude of the public sector wage premium depends on an employee’s educational qualifications (figure 17a). A growing body of research finds that higher wages in public jobs can partially be explained by job composition and worker characteristics (Baig et al. 2021; Gindling et al. 2020). The public sector wage premium is estimated to have a concave relationship with employee education. Individuals with secondary levels of educational qualifications enjoy a higher premium than individuals with no or low levels of education, but individuals with tertiary education experience a much smaller wage premium and in fact, a wage

penalty for workers in 38 countries. Similarly, females enjoy a wage premium in the public sector that is twice as large as that for males (figure 17b). It is important to consider these wage premiums in relation to the private sector. Specifically, analysis has more to do with the opportunity costs for employment in the private sector than the state of compensation in the public sector. The main reason that tertiary educated individuals earn a low or no premium compared to private sector workers is due to the ability to earn greater wages in the private sector. Similarly, the large wage premium for females in the public sector has greater implications for the large gender pay gaps that exist in the private sector.

FIGURE 17 - The Public Sector Wage Premium Varies by Worker Characteristics



Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

The public sector premium is lower when public workers are compared to private workers doing similar jobs.

This analysis implicitly assumes that workers with the same personal characteristics should be paid the same wage irrespective of the industry or occupation of employment. As seen in figure 5, public employment is concentrated in a few industries or sectors of the economy (public administration, education, and healthcare). Similarly, wages vary substantially by type of occupation, and public employment is concentrated within a few occupational groups (including managerial,

professional, and clerical occupations, and not so much in sales or agricultural workers). One approximate way for controlling for industry and occupation is to compare the public sector wage premium only to formal private sector workers. The public sector premium reduces to 7.3 percent globally, with 62 of the 84 countries in the sample having a statistically significant public sector earnings premium at the 5 percent level. As figure 18 shows, the public sector wage premiums vary substantially across regions but are lower in all regions when restricting analysis to formal wage employees.

FIGURE 18 - The Premium Is Lower When Comparing Similar Workers



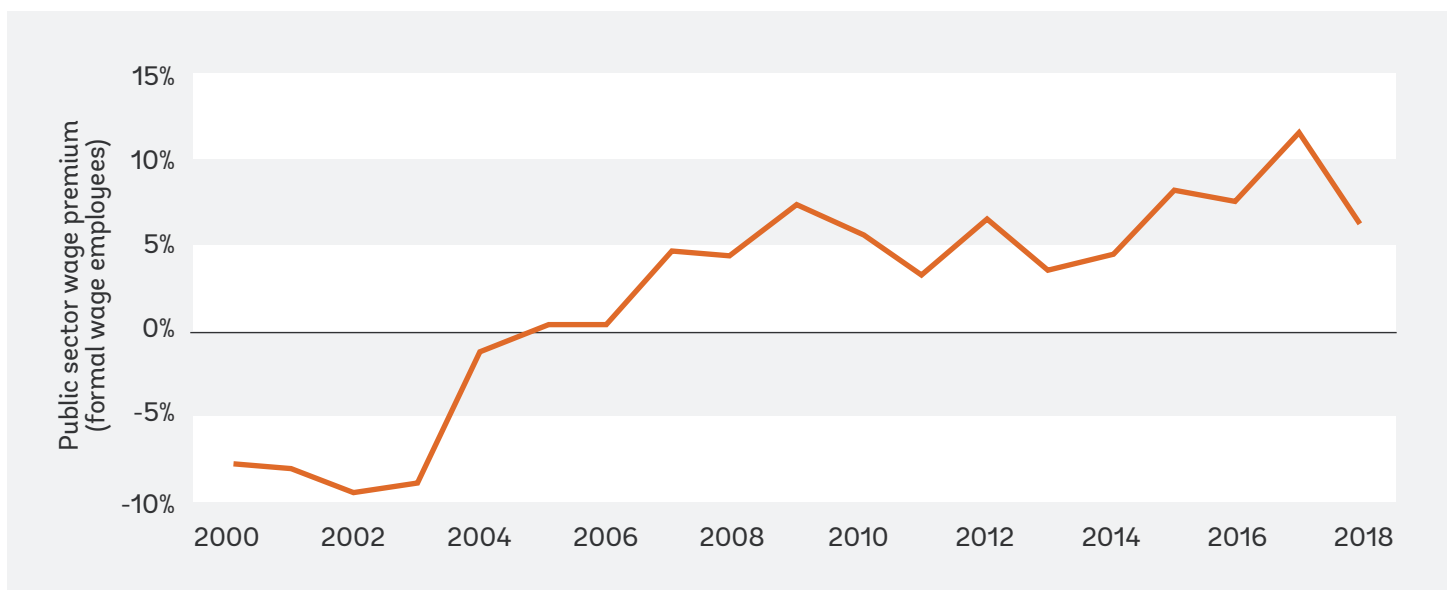
Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

However, the wage premium for formal workers has been increasing steadily for employees with a tertiary degree.

Since the early 2000s, the public sector workforce with a tertiary degree has been earning significantly more compared to formal wage workers in the private sector (figure 19). In fact, the wage premium has continued to increase. In 2017, those with a tertiary degree received salaries that were 10 percentage

points higher than a formal wage worker (differences exist depending on the occupation of employment). Significant wage premiums in the public sector and high accompanied fiscal costs of public sector workers have implications for public sector performance and productivity. Whether these relatively high wages incentivize better public sector performance or not is still a question that needs to be addressed in future research.

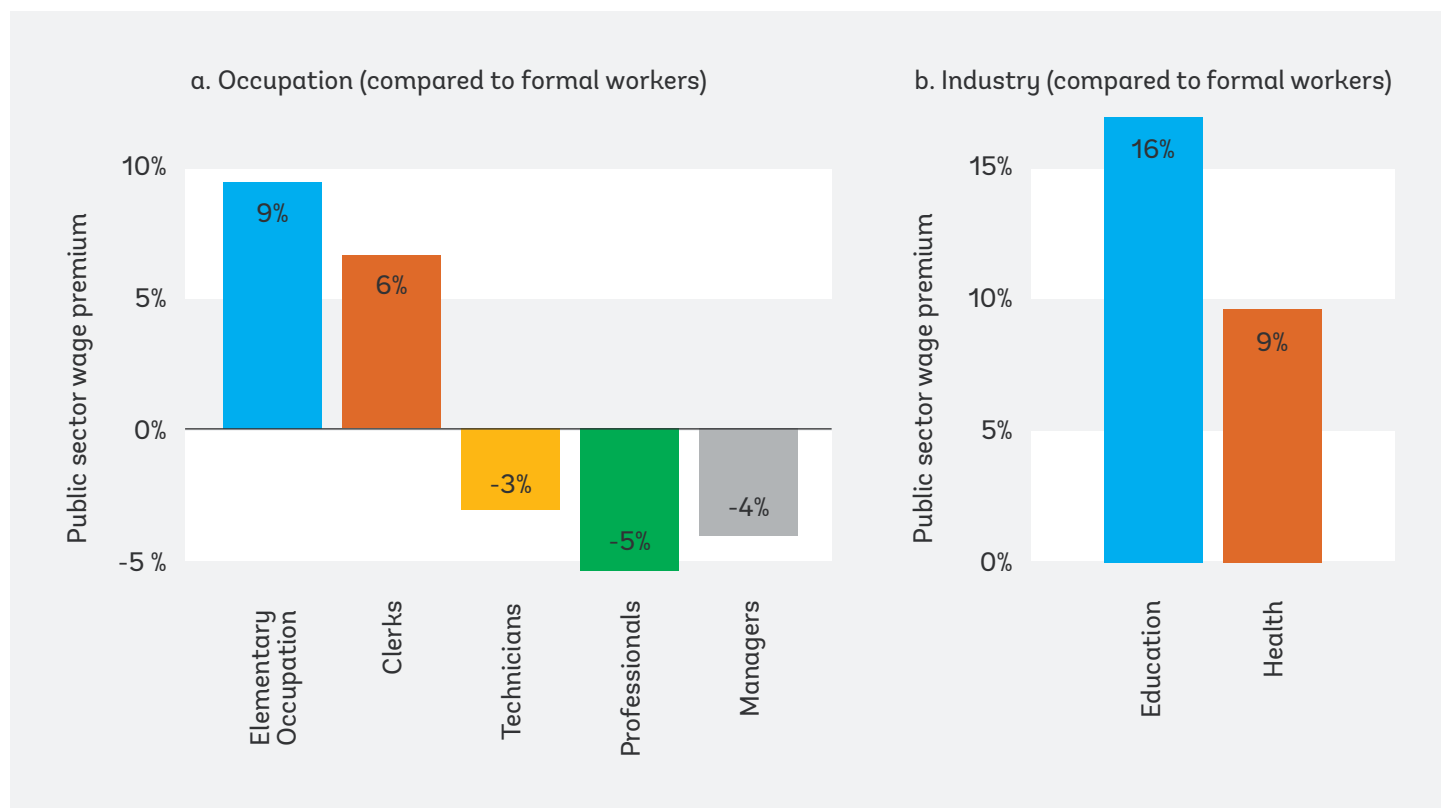
FIGURE 19 - The Public Sector Wage Premium Has Risen for Tertiary Educated Formal Employees



Source: Worldwide Bureaucracy Indicators, 2000–2018.

A more detailed analysis of the public sector wage premium by industry and occupation reveals its heterogeneity across types of work. Figure 20 shows that the public sector wage premium is higher for individuals employed in elementary or clerical occupations: 9 percent and 6 percent, respectively. However, individuals employed as technicians, professionals, or managers earn a wage penalty compared to private sector workers in similar occupations even after controlling for personnel characteristics. While it is not possible to compare public administration since the industry does not exist in the private sector, it is possible to compare the compensations of public sector workers employed in the education and healthcare sectors with their private sector counterparts. In both industries, public sectors workers enjoy a wage premium over the private sector.

FIGURE 20 - Public Sector Wage Premium Varies by Sector of Employment



Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

Public sector enterprises represent another important source of variation for public sector wage premiums.

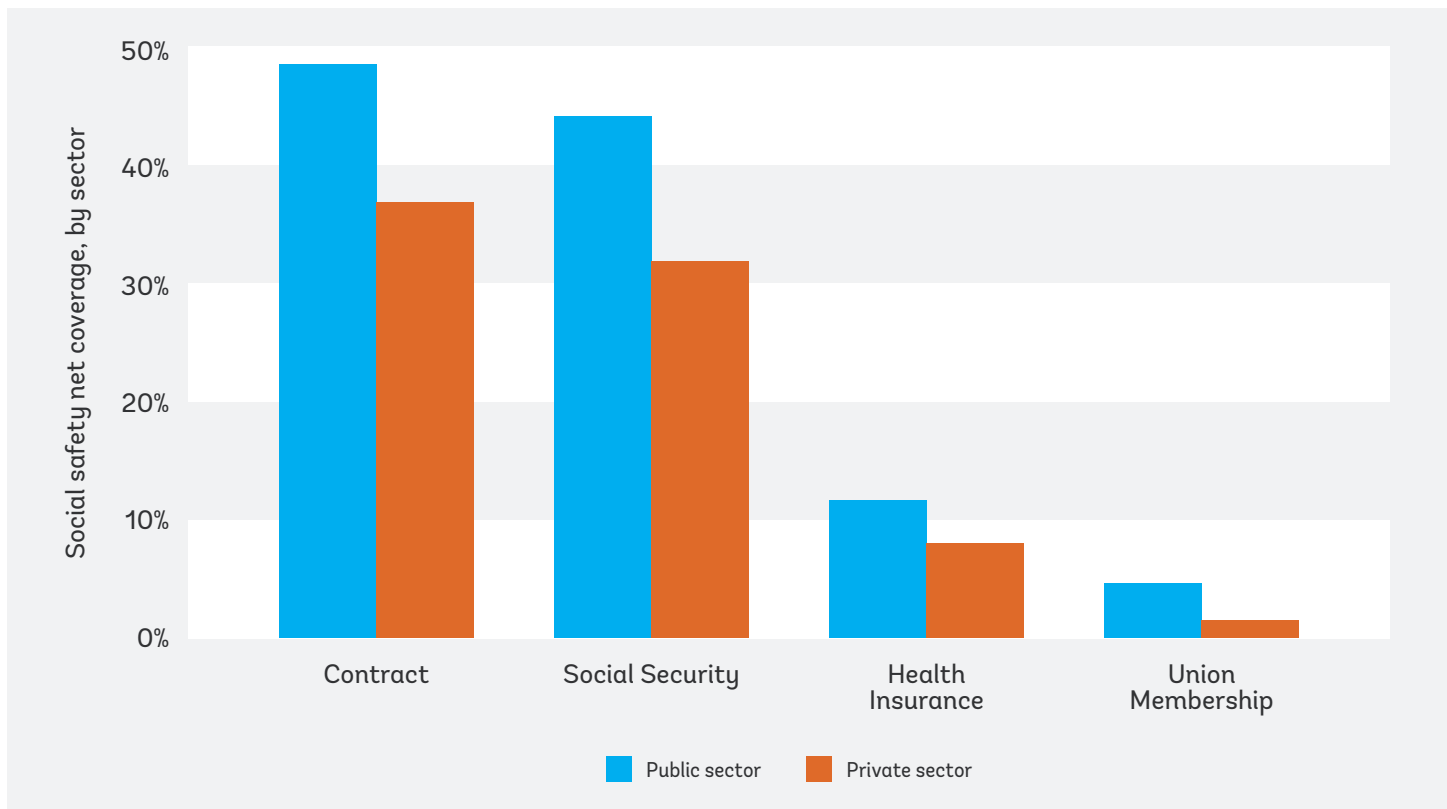
As mentioned previously, the definition of the public sector used in the WWBI includes individuals employed in public administration and security services, healthcare, and education, as well as a multitude of public for-profit enterprises and SOEs across a wide spectrum of industries. Individuals employed within these public enterprises and SOEs, unlike those employed in public administration, have more precise comparators in the private sector. Therefore, a fuller assessment of the public sector wage premiums would require the decomposition of public sector employment across these sectors and industries. Given the immense importance and large representation of these two industries within the public sector workforce, compensation for two such industries, education and healthcare, were decomposed. Unfortunately, data limitations hinder the expansion of this analysis to other

sectors of employment. However, this remains on the agenda for future iterations of the WWBI.

Public sector premiums, in general, are likely to be higher when benefits are taken into account.

Another illustration of the unique nature of the public sector is its primacy in the formal economy. An increased level of formality implies a greater prevalence of formal employment benefits in the public sector as opposed to the private sector. A much higher proportion of public sector workers enjoy benefits, such as job security, as well as receive pecuniary subsidies, including health insurance or pensions (figure 21). While the WWBI cannot calculate the public sector wage premium taking these monetary incentives into account, the literature suggests it is large and statistically important. In Cameroon, for example, per diems for attending meetings were equivalent to the base wages of civil servants (World Bank 2018).

FIGURE 21 - The Public Sector Provides More Benefits than the Private Sector



Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

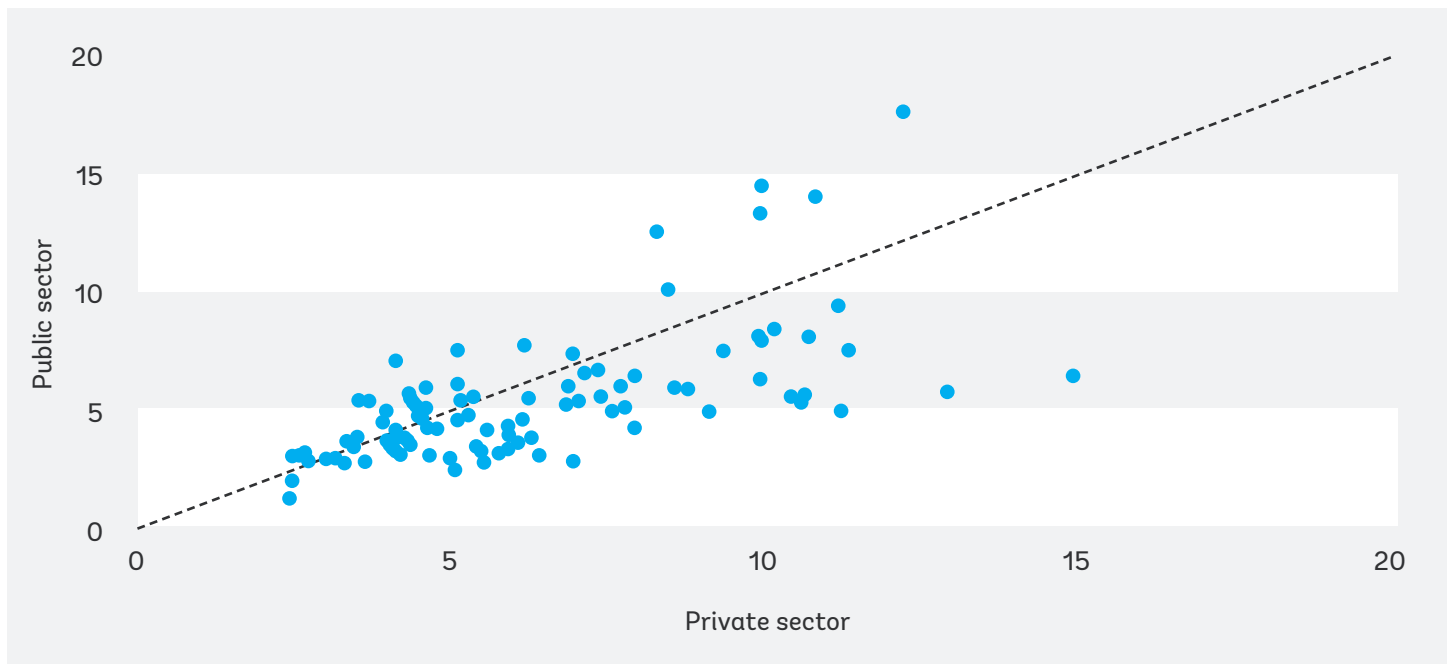
Relative Wages and Compression Ratios

Relative wages within the public sector are another important contributor to worker motivation and productivity. Much of the focus in the previous section was on the size of the wage differential between a typical worker employed in the public sector and their statistically comparable counterpart in the private sector. As discussed above, the public sector workforce represents a specific subset of the national labor force as employment is concentrated within a few industries (public administration, education, and healthcare) and certain occupational groups (including managerial, professional, and clerical occupations). Therefore, a second equally important element of public sector wage structure are the differences in wages for workers in different segments of the public sector workforce. Studies have shown that workers compare their wages to their peers in an organization, just as they do to the private sector, and wage differentials that are not perceived to be justifiable can be demotivating (Borjas 2003). Additionally, wage equity—whether staff in similar jobs,

with similar skills and similar performance are paid equally—impacts worker motivation and productivity and can be a major driver of the wage bill.

Wage dispersion is generally higher in the private sector than in the public sector. One common metric is the wage compression ratio which is the ratio of the 90th percentile wage to the 10th percentile wage in the salary distribution. This ratio is lower in the public sector for 70 out of 99 countries for which there is data (figure 22). The average wage compression ratio for the public sector across 101 counterparts is 4.9 compared to 6.3 in the private sector. The lower dispersion in the public sector reveals a tradeoff between equity and pay competitiveness at the top of the salary distribution that governments manage. A growing literature finds that relatively compressed wage structures in the public sector can lead to difficulties in attracting and maintaining a cadre of high-skilled functionaries in the public sector (Borjas 2003).

FIGURE 22 - Public Sector Employees Experience a Flatter Pay Compression Ratio

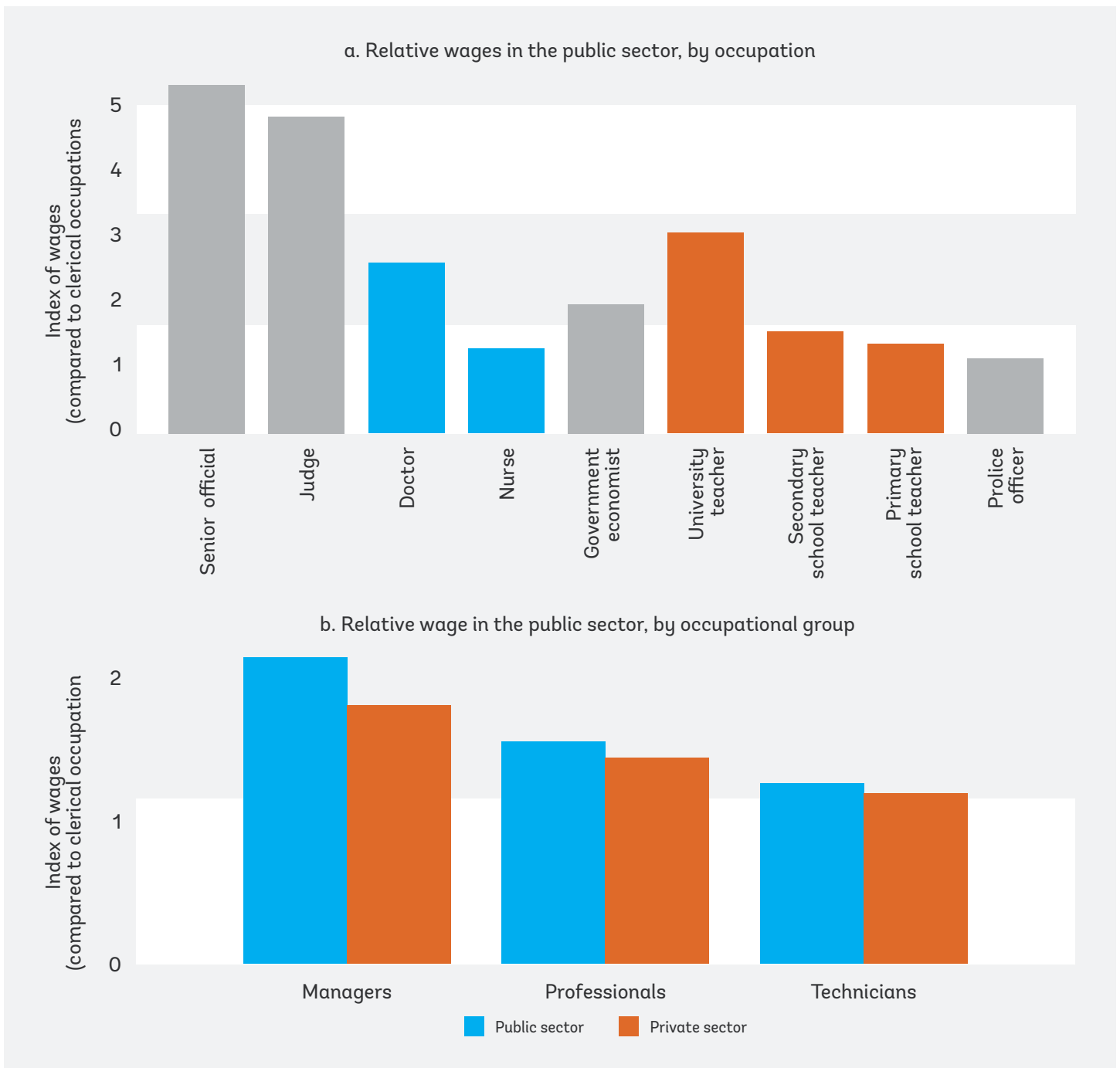


Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

Public sector wages vary by occupation, and pay progressions become flatter with seniority. A second metric for relative pay is the ratio of the wages of the indexed occupations to clerical occupations (as the benchmark). Globally, senior officials and judges are some of the highest-paid public sector employees, receiving around five times the wages of those employed in clerical occupations in the public sector. Additionally, university teachers receive twice more than secondary and primary school teachers, and doctors earn twice nurses' salaries. Police officers, on average, receive only marginally higher salaries than individuals employed in

clerical occupations (figure 23a). Moreover, while managers (which includes senior officials), on average, earn about 1.8 times the wages of clerical workers, managers in the private sector earn almost 2.2 times the average private sector clerical workers (figure 23b). Similarly, professionals (which includes judges, doctors and nurses, teachers, and economists) and technicians experience relatively lower levels of relative wages in the public sector. While some occupations in the public sector may not have direct compliments in the private sector, the relative wage ratios are of importance for retaining and motivating qualified employees in the public sector.

FIGURE 23 - Relative Wages in the Public Vary by Occupations and Seniority

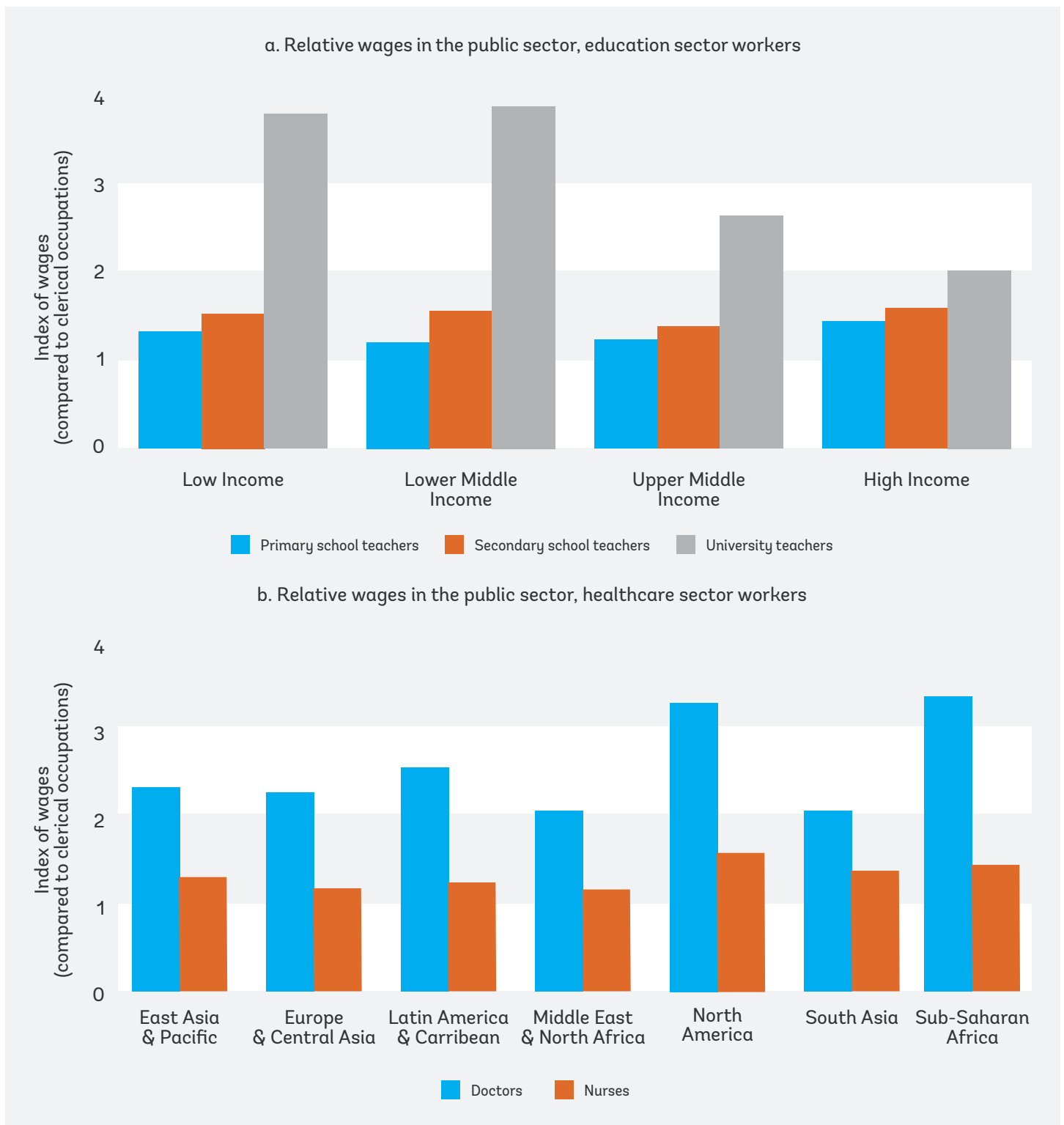


Source: Worldwide Bureaucracy Indicators, 2017

Relative wages within industries also vary by country incomes. Another important source of wage comparison in the public sector is individuals employed within different occupations in the same industry. Data from the WWBI reveals that while primary and secondary workers earn relatively similar wages compared to clerical workers in most countries (1.35:1 and 1.56:1 for primary and secondary school teachers,

respectively), university teachers earn a considerable premium over both (on average 3.1 times the wages of clerical workers). This premium over primary and secondary school teachers falls with country incomes (figure 24a). However, a similarly clear relationship between the disparities of wages of nurses and doctors (compare to clerical workers) and country incomes is not found (figure 24b).

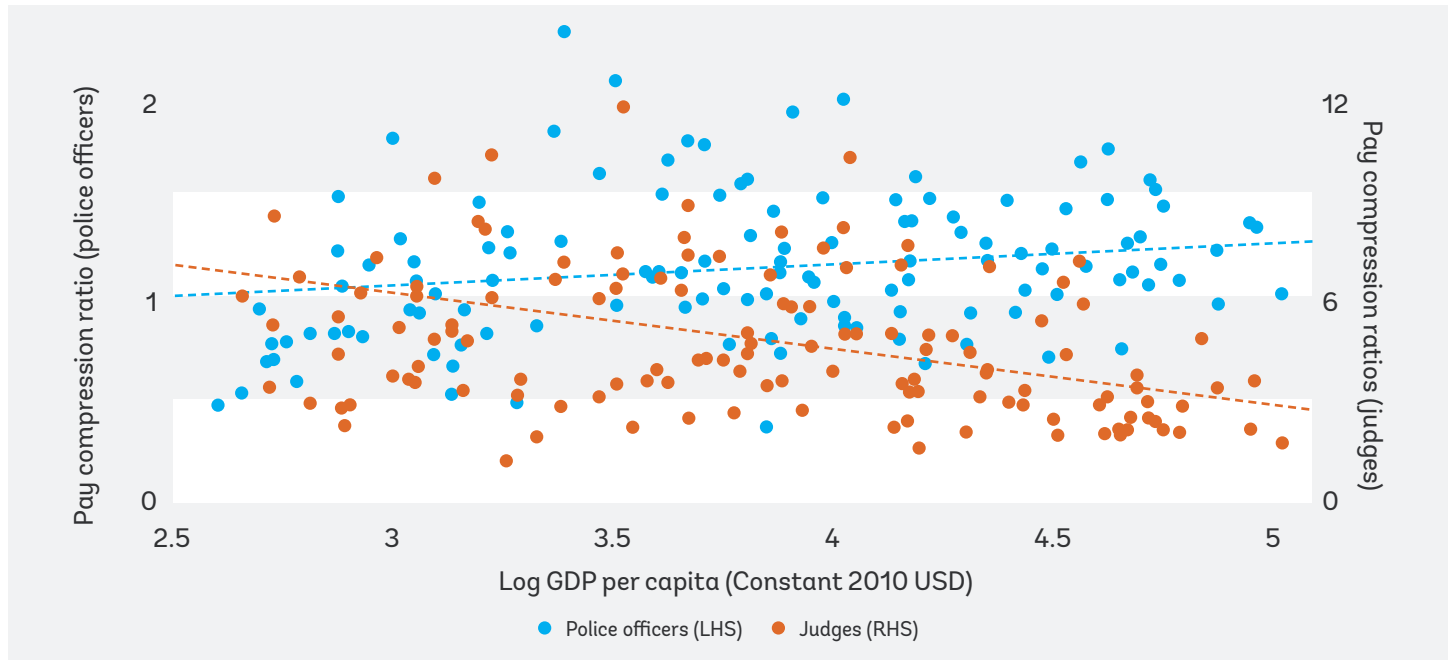
FIGURE 24 - Relative Wages of Key Service Delivery Staff Can Vary Significantly



Source: Worldwide Bureaucracy Indicators, 2017

Relative compression ratios of similar occupations may highlight disparities within the public sector. Taking the example of the justice sector, the pay compression ratios for judges is negatively correlated with country incomes while the same for police officers is positively correlated. Moreover, given that police officers make one-fifth compared to the judges, these increasingly polarized rates of compensation for police officers compared to judges in low- and middle-income countries can potentially be a source of demotivation (figure 25).

FIGURE 25 - Relative Wages of Key Service Delivery Staff in the Justice Sector

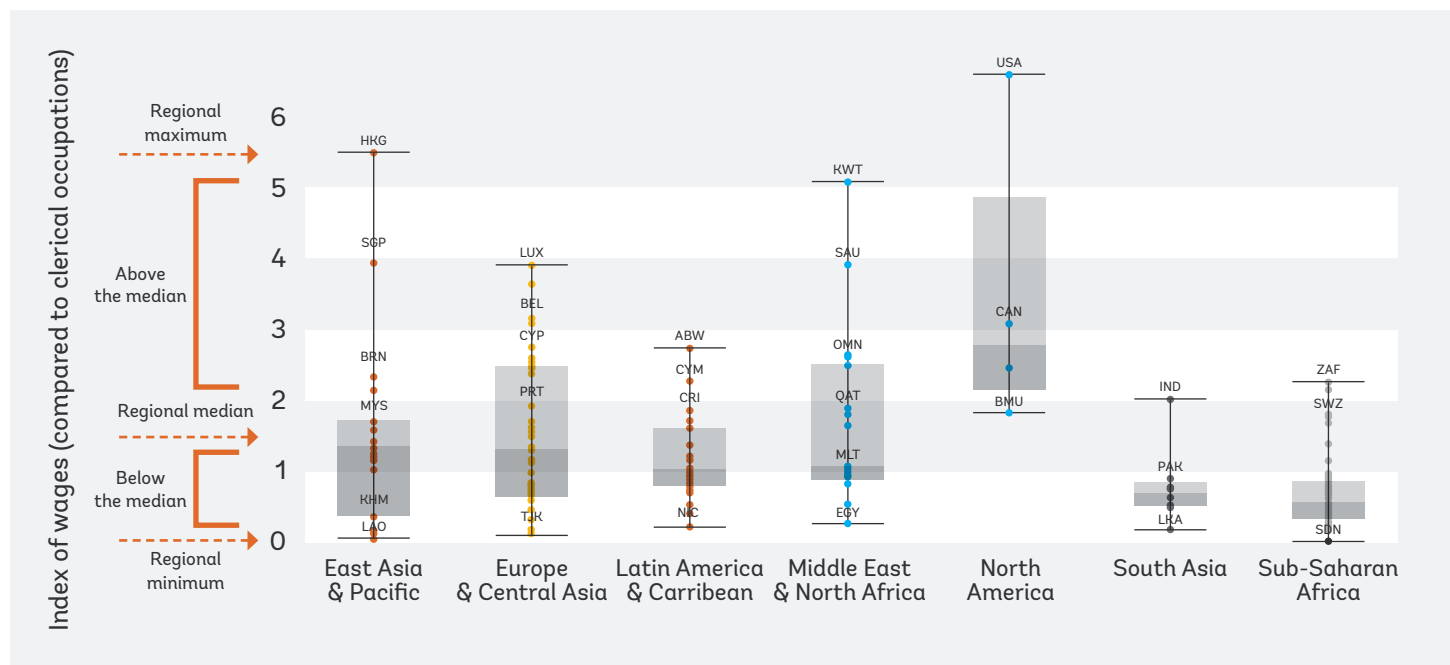


Source: Worldwide Bureaucracy Indicators, 2017

Given that certain occupations may only or mostly exist in the public sector, a preferred appropriate benchmark may be the public sectors of other countries. Police and security occupations have limited private sector alternatives. Similarly, over almost 77 percent of education sector workers are employed in the public sector, with higher ratios in low- and middle-income countries. Doctors and nurses have a high incidence of migration, and retaining these workers requires tracking the wages for these occupations in destination countries. The ICP's wage data enable cross-national wage comparisons for specific occupations adjusted for purchasing

power parity. They reveal that, for example, South Africa provides the highest wages for hospital doctors (relative to the global median) employed in the public sector among Sub-Saharan African countries (figure 26). This difference in the wages of doctors may result in economic migration of doctors into South Africa. Globally, The United States provides the highest levels of compensation for public sector doctors in the world, even after considering its high cost of living. International public sector wage benchmarking for high-demand jobs with relevant countries can be a valuable complement to public-private wage comparisons.

FIGURE 26 - Cross-country Public Sector Pays Comparison Ratio: Hospital Doctor



Source: Worldwide Bureaucracy Indicators, 2017

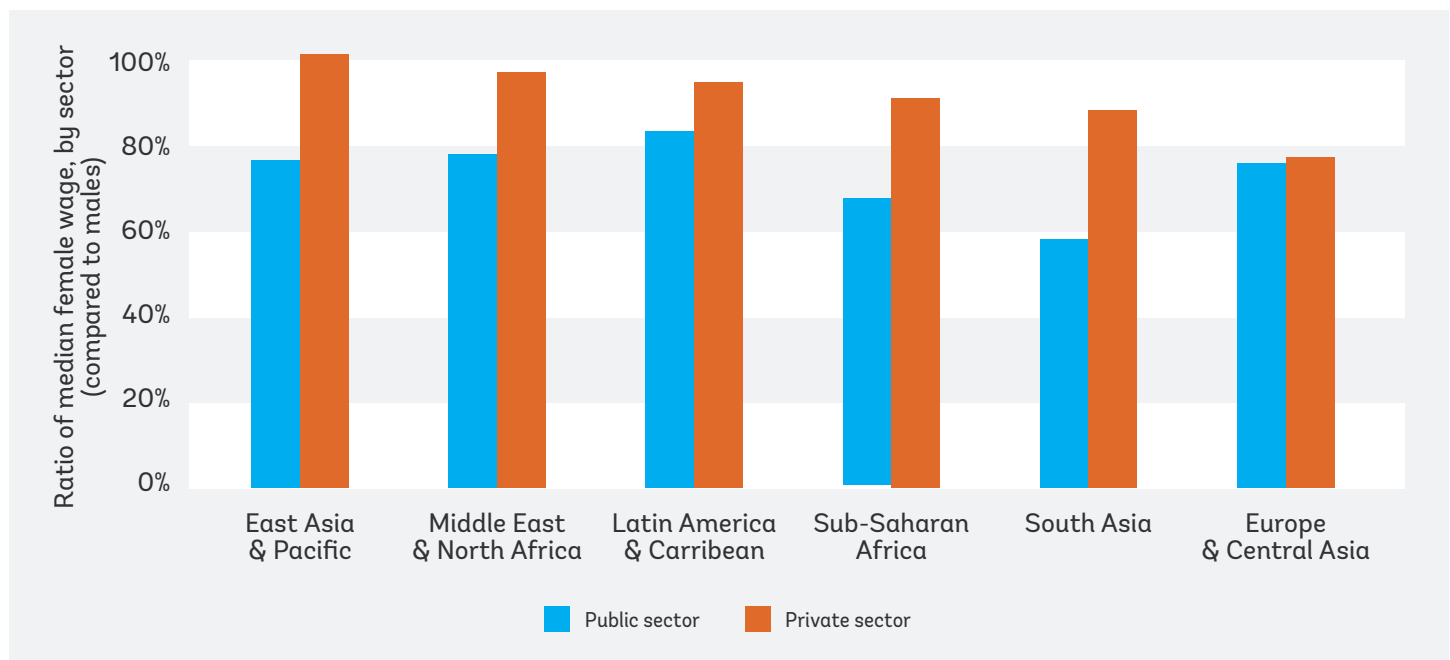
Gender Pay Gap

The public sector operationalizes its large labor market footprint for improving gender equality in public sector employment. It is well known that women globally earn significantly less in the private sector than men for doing the same work, with the disparity holding for developed and developing countries. While one source of the gender pay gap is lower rates of female labor force participation rates, the issue is multi-dimensional and intersectional. The reasons for this inequality in employment are under studied, but a growing body of literature is devoted to understanding and rectifying the sources of this disparity. Studies cover social norms and attitudes about what type of work women are more suited to (Boniol et al. 2019); divergent rates of salary negotiations between men and women (Babcock and Lashever 2003; Azmat and Petrongolo 2014); levels of competition (Niederle and Vesterlund 2007; Flory, Leibbrandt, and List 2015) or influence (Coffman 2014) and selection across task assignment (Babcock et al. 2017); and care-

related responsibilities that limit women’s career progression (Kleven et al. 2019) and create biases in task assignments so that women are less likely to receive more visible and career-enhancing responsibilities.

Women globally earn significantly less than men for doing the same work in public and private sectors. Figure 27 illustrates the male to female wage ratio in the public and private sectors across Regions. While this divergence holds for developed and developing countries, it varies across Regions. Additionally, the difference is relatively smaller in the public sector. Females earn 87 percent in the public sector but 74 percent in the private sector compared to the salary of respective male counterparts. The public sector wage gap is substantially less than the private sector wage gap in South Asia while being roughly equivalent in Europe and Central Asia.

FIGURE 27 - The Gender Wage Gap Is Lower in the Public Sector and Varies by Region

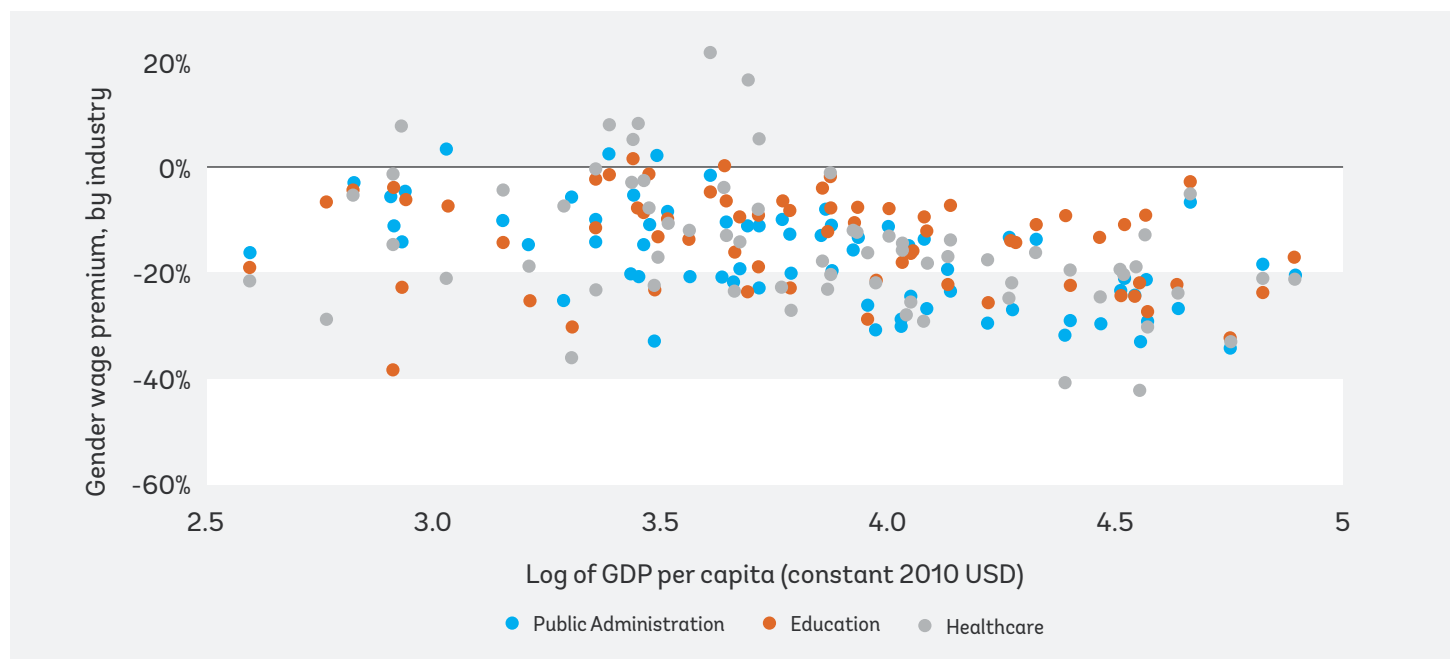


Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

Female wage penalties persist even in industries with high female representation. Figure 14a showed how females perform most tasks in the public sector education and healthcare sectors, but their participation is mostly confined to lower-paid occupations. In 191 of 201 observations for gender wage premiums by industry, women face wage penalty compared to their male counterparts working similar jobs with

similar hours (figure 28). This disparity, like the public sector wage premium, is after accounting for differences in age, educational qualifications, and location. The average global gender wage penalty is 14 percent for education, 20 percent for healthcare, and 21 percent for public administration industries, respectively.

FIGURE 28 - Gender Wage Gaps Persist Even in Industries with Large Female Representation



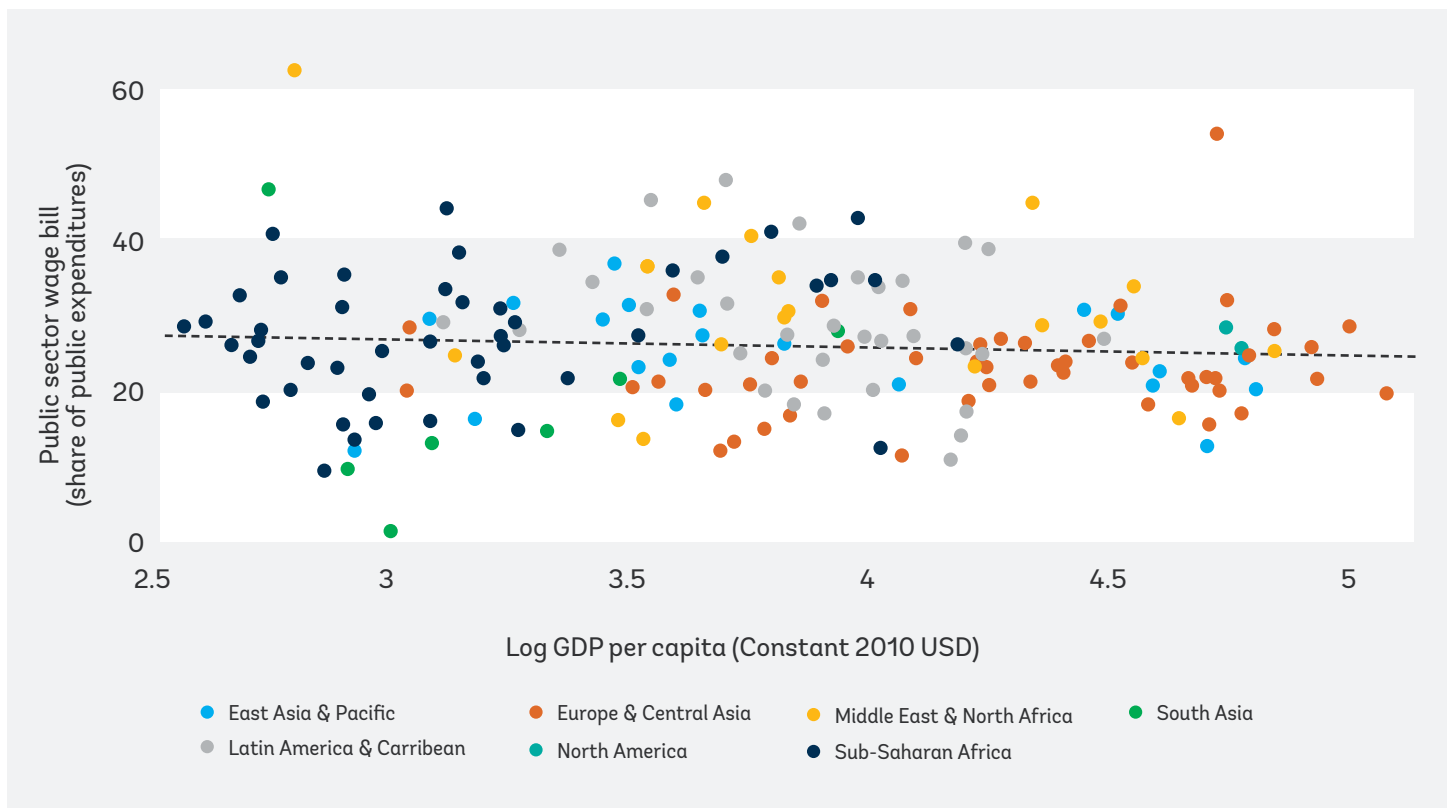
Source: Worldwide Bureaucracy Indicators, World Development Indicators, latest observations per country (multiple years).

Public Sector Wage Bill

The effective management of public sector employment and compensation is a vital activity of governments with broad implications for fiscal sustainability, public sector productivity, and the competitiveness of the overall labor market. Government expenditures on employees and retirees represent a large proportion of their expenses. Therefore, wage bill management has fiscal and expenditure efficiency implications. The objective of employment and wage policies is to maximize public sector productivity in a fiscally sustainable manner and without distorting the overall labor market. Explicit in this objective is a difficult technical and political trade-off. Wage bill management has traditionally been approached primarily from a fiscal sustainability perspective, often in the context of an economic crisis, prioritizing short-term fixes as opposed to well-designed reforms that take the long-term implications of the recommendations into account.

The wage bill represents a large and less flexible proportion of government expenditures with significant future liabilities. Globally, and noting the difficulties with cross-country comparisons, the wage bill represents about 30 percent of government expenditures (figure 29), with significant variation around this average. In many low- and middle-income countries, the wage bill can take up almost half of all government expenditures. These wage bill numbers underestimate the full fiscal costs of public sector workers given the generous pension benefits that they enjoy. In Brazil, for example, the wage bill is 13 percent of gross domestic product (GDP), and public sector pension expenditures are another 4 percent of GDP (World Bank 2017).

FIGURE 29 - The Public Sector Wage Bill Is a Significant Share of Public Expenditure

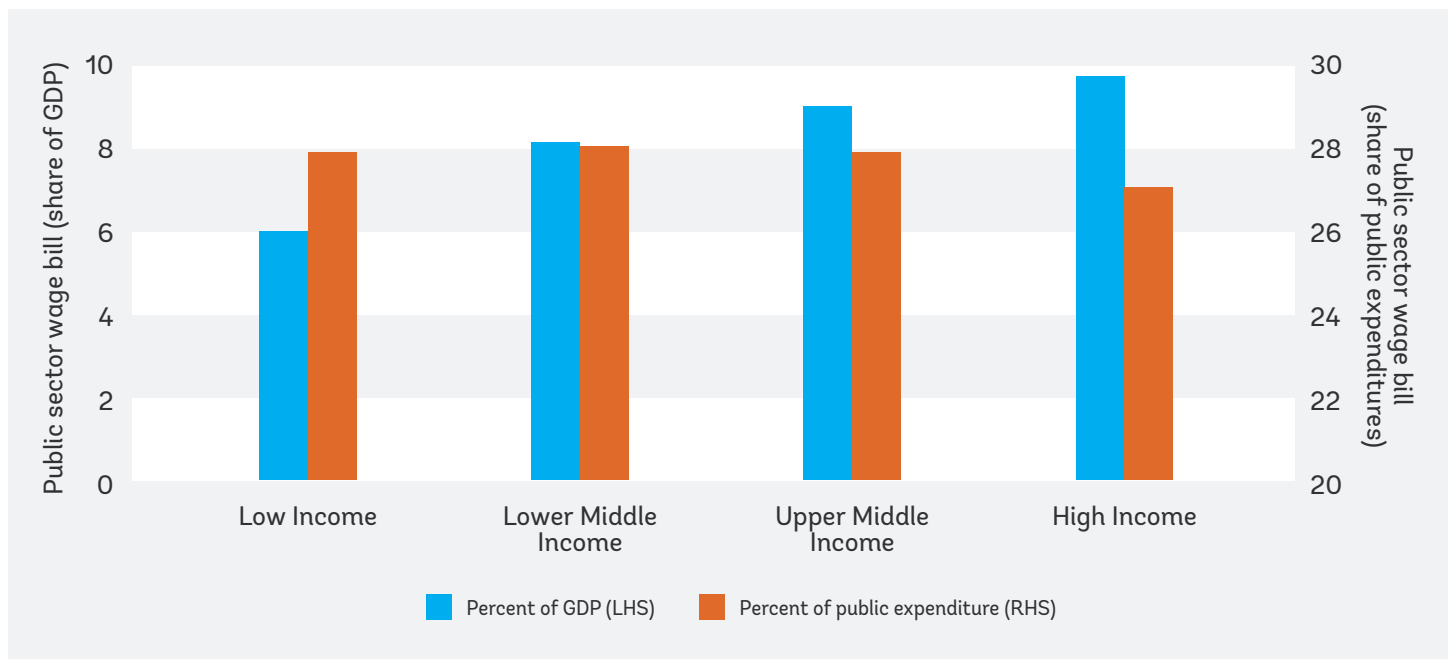


Source: Worldwide Bureaucracy Indicators, World Development Indicators, latest observations per country (multiple years).

A negative relationship exists between the relative size of the public sector wage bill within GDP and country income. While high-income countries spend a larger proportion of their GDP on the public sector wage bill, this expenditure represents a slightly smaller if not roughly similar proportion of their total public outlays as compared to low- and middle-income countries (figure 30). Public wage bill spending (as a share of GDP) differs more substantially between high- and low-income countries—63 percent higher for high-income countries compared to low-income countries. The difference in the relative spending of countries within different income categories is relatively less muted with high-income countries spending differing by just over 3 percent between high and

low-income countries; roughly 27 percent of total public spending in high-income countries to 28 percent in low-income countries. The large difference in the relative size of the public sector wage bill (as a fraction of GDP) is partly due to the greater demands on public services that accompany higher levels of economic development. The relatively stable share of public wages (within government expenditures) is most likely due to the sticky nature of public expenditures that increase countercyclically but do not contract as elastically in growth periods, thus further necessitating a systematic review of public expenditures through a robust and evidence driven framework.

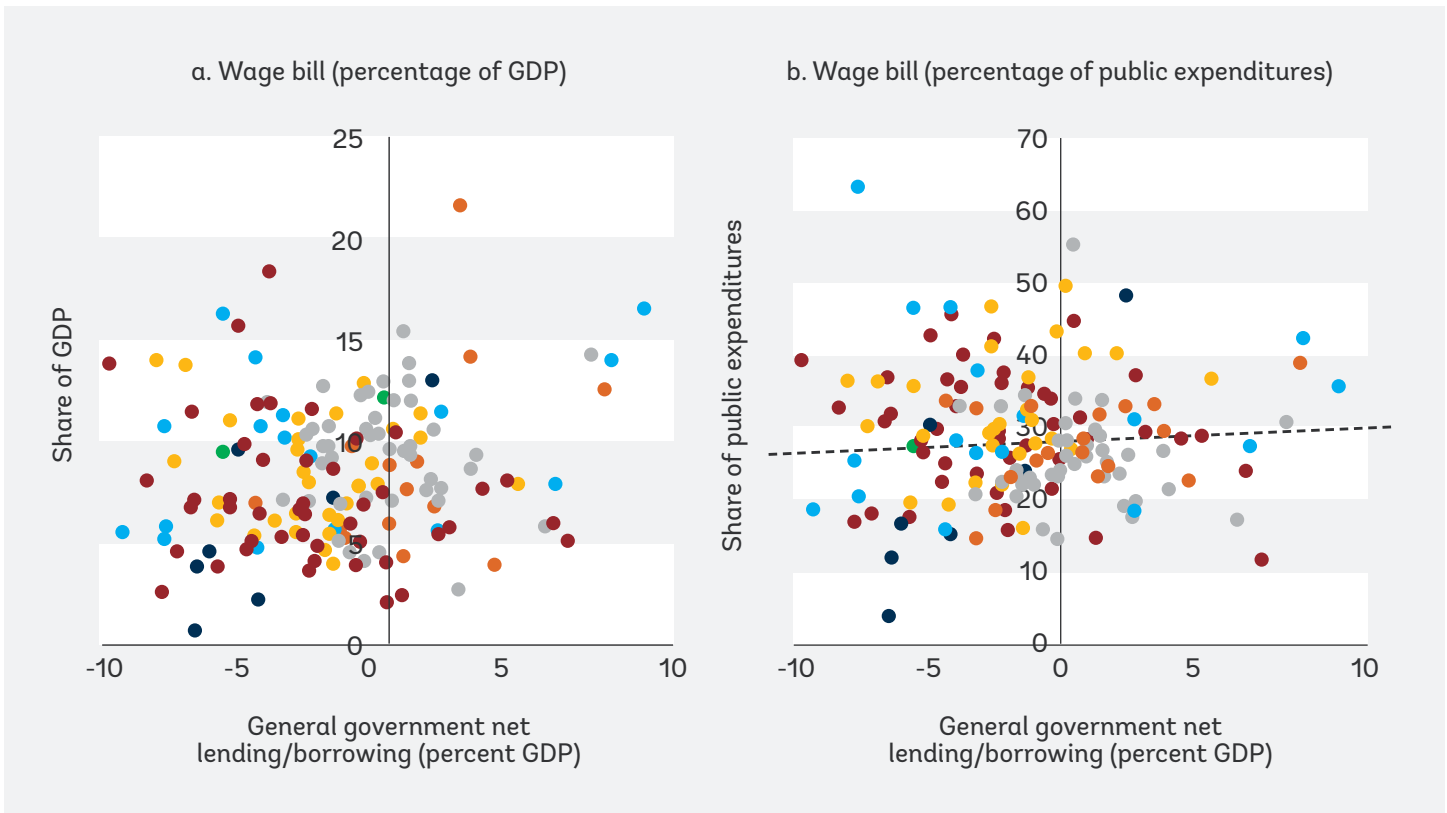
FIGURE 30 - Variations in the Public Sector Wage Bill by Country Income



Source: Worldwide Bureaucracy Indicators, latest observations per country (multiple years).

The wage bill can potentially have a major effect on fiscal balances, but there are no simple benchmarks of the “right” size of the wage bill. The most used metric for estimating the size of the wage bill (i.e., the wage bill as a share of GDP) is not a good indicator of fiscal impact given the cross-national heterogeneity in government functions, scope, and size. While the global wage bill average is about 9 percent of GDP, it is incorrect to conclude that countries with wage bills below this number, or below some other average for comparable countries, have more fiscally sustainable wage bills than countries with higher averages. Cross-nationally, there is no correlation between the size of the wage bill and fiscal balances. For example, Denmark has one of the highest wage bills in the world at over 17 percent of GDP, but has generally achieved budgetary surpluses. A better measure is the wage bill as a share of expenditures and revenues, but even here, there is no discernable relationship with fiscal deficits (figure 31).

FIGURE 31 - The Public Sector Wage Bill Is Uncorrelated with Fiscal Deficits and Surpluses



Source: Worldwide Bureaucracy Indicators, IMF World Economic Outlook, latest observations per country (multiple years).

4. Potential Applications of the Dataset

Chapter 3 provided a glimpse into the many new insights that the WWBI can provide. Chapter 4 discusses how the true potential of the WWBI is not limited to the findings of this summary analysis. Instead, its potential rests in its ability as a tool for benchmarking progress and disparities between countries and regions, its usefulness for analytical assessments and diagnostics of differences, and as an ingredient in empirical exercises.

Regional and Country Profiles

The WWBI can be a source for global benchmarking on pay and employment that policy makers and development practitioners can use as part of their regular monitoring activities. Benchmarking is used widely in the private sector to identify areas where processes might be improved and similar gains could be achieved in the public sector. The global nature of WWBI's coverage allows for comparisons of public sector employment and wages, both within and across geographical regions, income groups, and lending categories. An interactive online dashboard facilitates easy benchmarking as a performance instrument and support tool for policy making and can be found [here](#). It includes country profiles for each of the 202 countries included in the WWBI and can be used to generate benchmarks, with a single click, for any of the indicators. These include the most recent data on public sector employment and compensation alongside the wage bill assessment for each country, such as figures capturing key labor market themes for each country (e.g., gender and educational attainment).

Fiscal Sustainability Analysis and Public Expenditure Reviews

Effective management of public sector employment and compensation is a vital activity for fiscal sustainability and expenditure efficiency. The WWBI can inform core World Bank analytical products, such as public expenditure reviews and wage bill assessments. Detailed data on the levels and distribution of public employment and wages can help identify more nuanced, targeted, and politically feasible reforms that make explicit the difficult trade-offs in pay and compensation policies. Such evidenced-based policy advice is necessary as, historically, wage bill diagnostics have often been done in the context of economic crises, with a primacy toward blunt, short-term fixes, such as across-the-board wage freezes or cuts. Quick fixes can have adverse impacts on long-term growth and welfare as well as political viability, and often create distortions and perverse incentives (IMF 2016). For example, freezing basic wages has often resulted in a mushrooming of less transparent allowances and salary supplements that reduce wage bill transparency, harm pay equity, and hurt productivity. Political economy factors are paramount in these policies, either explicitly so, as in the role of trade unions, or implicitly. Public sector employees are a powerful stakeholder group in most countries and have a significant voice in what reforms are on and off the table. Better data can help with implementing more incentive-compatible reforms, such as reducing pay inequity by curtailing extremely high pay or non-transparent allowances.

Public Sector Productivity Diagnostics

A key question the WWBI can help answer is whether the public sector workforce is performing well and delivering high-quality infrastructure, services, and regulations, which is a question of public sector labor productivity. Productivity measures the efficiency with which inputs (e.g., labor) are converted into outputs and is a more precise and economically meaningful concept than “performance” since presumably performance can be improved by spending more. In contrast, productivity measures whether more is produced and delivered for a given wage bill. While productivity has a variety of measurement difficulties, the WWBI can be used to generate useful proxies for productivity, such as service delivery outcome indicators per service delivery staff. A large body of research shows that the skills, incentives, and

accountabilities of “street-level” bureaucrats, like doctors, police officers, and teachers, are the main determinants of service delivery outcomes (Finan, Olken, and Pande 2017). Moreover, given the high proportion of education and health personnel in the public sector, the dataset provides a reasonably comprehensive measure for a large segment of the public sector. It can contribute to this literature by analyzing whether increased spending on the public sector education and healthcare workforce is correlated with improvements in student learning outcomes or health outputs, such as the number of consultations or patients discharged per doctor.

The WWBI can be used to explore the behavioral determinants of productivity, such as public employee motivation. While it may be reasonable to expect better-paid public employees to be more motivated and less corrupt, cross-national estimates of public sector effectiveness and accountability using measures of the quality of governance, such as the WGI, reveal no clear relationship with public sector wage premiums. Therefore, a second equally important set of determinants of public sector productivity, the *human resource management* aspects of the public sector, warrant consideration. For example, whether public sector employees are productive depends on merit-based recruitment and performance management as much as the appropriate number of staff numbers and competitive pay (Behn 1995; Christensen, Paarlberg, and Perry 2017; Moynihan and Pandey 2010; Wright 2001). Unlike individuals employed in frontline service delivery (such as doctors and teachers), literature on the motivations of public administrators—responsible for policy making, regulating, financing, and monitoring the work of frontline service providers—is relatively less developed. The WWBI can be used to perform more nuanced investigations into the relative ability of pecuniary and non-monetary incentives for boosting worker efficiency and productivity and reducing employee turnover. The indicators included within the WWBI can be combined with others, based on complementary prosocial motivations from other sources, to explore the relative importance of motivation on public employee productivity and their initial decision to join and remain in the public sector (Hasnain et al. 2019; U.S. Merit System Protection Board 2008; Perry and Vandenabeele 2015).

Jobs and Economic Transformation

The need for more and better jobs is a top development priority, particularly in low- and lower-middle-income countries with a high proportion of youth. The challenge of

this task is significantly impacted by public sector employment and compensation policies. While the private sector will have primary responsibility for growing jobs, research and policy advice need to examine the public and private sectors holistically, exploring the interactions between the two, given the major role that the public sector has as an employer. This is particularly so in low- and middle-income countries in which the public sector is the dominant formal sector employer. Presently unanswered questions on the appropriate levels of employment and compensation for public sector workers—sufficient for attracting and motivating quality staff without distorting the overall labor market and causing misallocations of labor—require particular attention. Given its nuanced coverage of public and private sector employment along with decomposition by occupations, industries, and levels of education, the WWBI can be useful in shedding light on the public sector’s ability to affect labor allocations between the public and the private sectors. Analysis of the public-private wage gap provides a good indication of these labor market effects, which can be complemented by exploring whether the public sector is a wage leader and influences private sector wage setting; and if a large and sustained demand for public sector jobs results in the crowding out of workers in the private sector or skills shortages, including long periods of unemployment as individuals queue for public sector jobs and reject private sector job offers.

Equality in the Public Sector

Building representative bureaucracies should be an important policy objective of governments, and the WWBI represents an ideal tool for benchmarking the varying successes of different countries. Improving equality of opportunity in the public sector is key to improved service delivery (Headley, Wright, and Meier 2021; Kennedy, Bishu, and Heckler 2019; Wise and Tschirhart 2000). Furthermore, the public sector’s large footprint means that it can be a strategic leader in changing norms and behaviors and promoting greater employment equality in the overall labor market. Governments and donors commit substantial resources to equality and diversity programs, and they must have the knowledge and evidence needed to develop the most effective programs and policies. The WWBI can help practitioners and policy makers expand their understanding of representative bureaucracy and provide evidence on the innovative approaches that can be operationalized. The dataset provides clear indicators on the share of employment at various levels of occupations ranging

from senior management to clerical staff and along income quintiles within the public sector. A large body of research shows the demotivating impact of large disparities in wages for peers working within the same or similar functions. For example, the diverging trends in compensation for men and women judges and police officers by country incomes can potentially be a source of demotivation.

Worker Adjustment Costs and Wage Rigidities

Persistent differences in public sector wage premiums for different segments may instead point to the existence of large adjustment costs or opportunity costs for some individuals to transition out of the public sector. Given the unique composition of the public sector workforce, along with gender, educational qualifications, occupations, and industries, certain occupations mostly if not entirely exist in the public sector. Additionally, research has shown diverging effects of extrinsic sources of motivation (including money and benefits) for public versus private sector workers in some settings (Frey, Homberg, and Osterloh 2013). In these countries, the existence of a public sector wage premium is shown to further amplify the intrinsic motivation of public employees (Hasnain and Manning 2014; Liu and Tang 2011). However, public sector premiums are not distributed equally across all public servants but differ extensively in magnitude from large premiums to strong penalties. These combined may point to the inability of some individuals to find suitable employment in the private sector or the disinterest of individuals to transition out of the public sector into the private sector, given the premiums.

Development professionals and researchers can use the WWBI to understand the relationship between these premiums and the ability to select between the public and private sectors. For example, the WWBI shows there are relatively lower levels of disparities between the wages of nurses and doctors compared to the wages of primary and secondary school teachers and university teachers. This may be due to the higher levels of cross-border economic migration for healthcare workers which does not allow for large differences in the wages of nurses and doctors to develop. Therefore, while public sector wages may not directly respond to price-setting mechanisms in the private sector, workers’ ability to switch between the private and public sectors may create equilibrating effects between public and private sector wages.

Myth of Bureaucratic Neutrality: Political Economy of the Public Sector

The existence of electoral budget cycles can potentially have large implications related to the size of the public sector workforce and consequently the wage bill. A relationship between the proximity of elections and public sector hiring practices can have impacts on public sector spending patterns. While there is theoretical evidence to show a relationship between the contiguity of the bureaucracy (as a monolith voting block) and propensity for incumbent support (Frey and Pommerehne 1982; Golden 2003), empirical literature is missing. WWBI, given its coverage across 19 years and 202 countries, is ideally suited for an exploration of this topic from a comparative studies perspective.

Conclusion

The WWBI was developed to satisfy the need for a global, cross-nationally comparable, and analytically rigorous dataset. As this report shows, the WWBI enables researchers, development practitioners, and policy makers to answer some of the most important questions on the appropriate level and distribution of employment in the public sector; the equity, transparency, and market competitiveness of public sector wages; and their impact on fiscal sustainability, the labor market, and service delivery. The micro-founded nature of

the WWBI's country-level indicators, its global coverage, the credibility of its primary sources, and an extensive suite of harmonization make it a unique and comprehensive dataset to explore these issues. The report details the methodology employed in the construction of the indicators, showcases some of the main findings from the dataset, and suggests some of its analytical and operational applications.

The WWBI is envisioned as a live database that will be regularly updated and expanded to meet its objective as a source of more evidence-based policy design on the public sector workforce. To achieve this, the WWBI also represents a call for more and better data on the public sector workforce. While the dataset already boasts global coverage, regional imbalances remain in terms of the coverage across countries, indicators, and years. These imbalances are primarily due to limited access to the labor force and other household surveys that are the primary sources of data. This results in irregular or dated coverage for certain regions over others. For example, WWBI coverage for European and Latin American countries is relatively comprehensive, with 44 percent of the countries having data after 2015 with an average of 7.5 years of coverage across the two regions. However, Middle East and East Asian countries are less represented in the dataset with only 5 percent of countries having data past 2015 and an average of only 1.5 years of coverage between 2000 and 2018. The future success of the WWBI rests on the ability of WWBI the team to leverage World Bank and government counterparts to improve the country and temporal coverage of the WWBI in the planned yearly updates of the dataset.

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More information about the World Bank Worldwide Bureaucracy Indicators, including an online data visualization dashboard, can be found [here](#).

The dataset, detailed explanatory note, and codebook are publicly available in the World Bank Data Catalog [here](#).

The entire Stata code used in cleaning and estimation has been archived on GitHub [here](#).