CHAPTER 27

Government Analytics Using Household Surveys

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SUMMARY

This chapter presents a guiding framework for using household survey microdata, readily available to most governments, to develop insights into the structure of the public sector workforce and the qualities of its compensation practices. National statistical authorities frequently collect household surveys with detailed information on labor force participation. These surveys are broadly consistent across time and are developed using globally standardized definitions and classification nomenclature. This offers governments unique insights into the public sector workforce that cannot be derived solely from administrative data sets, including the ability to juxtapose the demographics and skills composition of the public sector workforce to the private sector and assess the relative equity and competitiveness of public sector compensation practices. The chapter provides illustrations of the insights into public sector employment and wages that can be generated by this framework, using examples from the World Bank's Worldwide Bureaucracy Indicators (WWBI). Such insights can inform policy choices related to managing human resources in the public service.

ANALYTICS IN PRACTICE

- Governments routinely conduct household surveys in order to understand the populations they serve, target public policy, and inform policy debates. Many of these surveys record a dedicated and detailed set of variables on the labor market experiences of people in the country, including whether respondents work in the public or private sector. By collecting comparable data across the two sectors, household surveys provide a foundation for understanding the characteristics of public officials compared with their private sector counterparts—which is not possible through administrative data sources alone. Including precise and coherent indicators of the employment sector in household surveys thus enables their use in understanding the characteristics of public sector workers.

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- Given the unique nature of the public sector, time-series and international benchmarks and comparisons are critical for understanding the current state of government functioning. The precision and consistency with which household surveys are conducted across time open up the possibility of understanding the longitudinal dynamics of the public sector relative to the private sector. Similarly, ensuring such surveys collect data in line with globally standardized definitions and classification nomenclature enables comparisons across countries.

- Setting up household surveys in this way allows the government to juxtapose any feature of individuals in the public and private sectors that surveys have collected data on. Demographic variables allow for an analysis of how gender-related differences in pay vary across sectors, regions, organizations, and so on. Assessments of the skills composition of the public sector workforce with respect to the private sector identify in what areas the government is competing most intensively for skills with private sector actors and what that competition is doing to wages.

- Taking household surveys as the foundation of analytics around the equity and competitiveness of public sector compensation practices is a relatively low-cost approach to the analytics of the personnel determinants of state capacity. However, the usefulness of these surveys is underpinned by the representativeness of sampling and interviews, which ensure that the resulting data provide a robust estimation of labor force participants. This requires coordination between agencies of public employment and national statistical agencies.

- Detailed data from household surveys on the distribution and remuneration of public employees can help identify more nuanced, targeted, and politically feasible reforms that make explicit the difficult trade-offs in employment and compensation policies. Such an evidence-based approach is necessary because, historically, public sector employment reforms have often occurred in the context of economic crises, with an emphasis on blunt, short-term fixes that can have adverse impacts on long-term growth and welfare, and often create distortions and perverse incentives.

INTRODUCTION

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. The wages of public sector employees consume a significant proportion of government expenditures. Across the world, government expenditures on employee compensation represent, on average, 30 percent of total expenditures (Hasnain et al. 2019). Spending on public sector salaries comes at the opportunity cost of spending on public sector programs.

At the same time, human resources in the public service are essential providers of government services and infrastructure, as well as ensuring the effectiveness of regulations (Arizti et al. 2020; Ingraham, Joyce, and Donahue 2003; Moynihan and Beazley 2016; Rasul and Rogger 2018). The size and nature of public sector wages affect the selection, retention, and motivation of public sector workers, which, in turn, impacts productivity, the amount and quality of government outputs, and public service provision (Finan, Olken, and Pande 2017).

These issues matter not only because they impact the quality of government functioning. The public sector is a large employer, accounting for, on average, 37 percent of global formal employment (Baig et al. 2021). Changes in government wages are likely to produce significant effects on the national labor market and the overall economy, including potentially crowding out recruits in the private sector (Behar and Mok 2013). In many lower-middle-income countries, especially those experiencing fragility, public sector employment is the core ingredient of the political settlement, and wage bill reforms have immediate and often severe implications for political stability, peace, and security (Gifford 2006).

There are thus 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, in particular? 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 promote gender equality in employment, both in absolute terms and relative to the private sector? And are public sector pay and employment practices contributing to robust and dynamic labor markets at the national and regional levels?

Answering these questions requires high-quality microdata on public sector employment and compensation and comparable data for the private sector. Utilizing household surveys as a source of information on public employment offers certain advantages over administrative data. These data are routinely collected by national statistical organizations for informing broader policy goals and thus represent a cost-effective tool for government analysts. Household surveys 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. Such surveys allow data to be drawn from the public and private sectors in a common manner. Thus, these data often represent a richer source of insights than are available from administrative data alone.

This chapter is targeted at government officials, development practitioners, and researchers who aim to gain a better understanding of the structure of the public sector labor market and its implications for the overall labor market. It begins by introducing the advantages of this survey-based framework and key areas for caution. It showcases the main features of the methodology and presents guidance for conducting analysis to delineate trends from these surveys. It goes on to provide guidance on how improvements in the design and conduct of labor force surveys allow for even more granular analysis. Finally, it illustrates the breadth of insights that can emerge from a study of public administration founded on household survey data. The approaches outlined here are a natural complement to those presented in chapter 10 of *The Government Analytics Handbook*, trading off the granularity of data with comparability with the private sector.

THE POWER OF USING HOUSEHOLD SURVEYS FOR GOVERNMENT ANALYTICS

Nationally representative *household surveys,* collected by national statistical authorities, are some of the most professionally conducted surveys in the world and are frequently supported or improved through consultations with multilateral organizations' data teams, which possess substantial experience in such exercises. By collecting data on a representative sample of the whole or some subset of the population, such surveys provide a window into the lives of those about whom data are collected. When surveys collect data on whether respondents work in the public or private sectors, they provide windows into life in those sectors.

This chapter will focus on employment-related variables in such surveys and thus on the *labor force modules* in household surveys. When these modules are the dominant concern of a survey, the survey is typically classified as a *labor force survey*. In much of the rest of the chapter, we will use these terms interchangeably. However, most of the principles of the discussion carry over to other elements of standard household surveys, such as consumption patterns drawn from consumption modules.

The Strengths of a Survey-Based Approach

Governments routinely rely on household survey sources to generate headline indicators of the health of labor markets and the overall economy. Insights emerging from these surveys are often used in the design of a wide array of economic and social policies. For example, information on the share of employed (and unemployed) individuals within the labor force frequently has direct consequences on the monetary and fiscal

policies of the government. Unemployment rates are often used as proxies for the vitality of the labor force and are used—in combination with inflation rates—in determining interest rates by central banks.

The quality of these data makes them an attractive foundation for government diagnostics of relative labor market characteristics and dynamics. Specifically, utilizing nationally representative labor force survey data to characterize public and private labor markets offers government and analysts five unique advantages over other data sources.

First, labor force surveys provide a rich, consistent, and regularly updated set of variables for a variety of worker characteristics in the labor market. Given the investments governments have made in methodological rigor, effective implementation, and quality assurance, these surveys are one of the richest available sources of information on population characteristics. Household surveys provide coherent descriptions of the composition of individuals within households, their demographics and qualifications, their consumption behaviors, and the nature and sector of their participation in the labor market, as well as detailed indicators on the industries and occupations they are engaged in and their salaries and other sources of compensation (including in-kind payments, government assistance programs, and social security benefits).

Second, labor force surveys undertake the same measurement approach across the public and private sector labor markets. This is a unique advantage of these surveys for measuring state capacity because these data are collected simultaneously for workers in both sectors from the same sample frame in a coherent manner. Administrative data sources (while being a potentially more accurate and detailed measure of employment and wages in the public sector) only include information on public sector employees and, at times, only the employees of particular ministries or organizations. It is extremely unlikely that any single administrative data set would not only cover workers employed across a diverse set of economic activities (from agriculture to mining, manufacturing, and the services sector) but also include information on both public and private sector labor force participants.[1] Even if such a data set does exist, its data will rarely be consistent with administrative data from other countries, complicating international comparisons.

Third, the granular nature of the underlying data ensures that labor market models are based on representative data sourced from across the economy. These surveys often sample thousands of employed individuals and are based on a meticulously designed sampling frame based on national census data, allowing for a close and accurate approximation of local labor markets. This reduces the assumptions on which analysis is based—the data are allowed to speak for themselves—and allows for decomposition by the characteristics of workers where sample sizes are sufficiently large.

Fourth, household surveys may represent a more complete view of the public sector workforce than even administrative data sets. Public sector administrative data are often too restrictive in defining who is included in their measurement. For example, contract workers have become an essential part of the public sector workforce, working alongside permanent staff in the promulgation of regulations and the delivery of social services. In many developing countries, they also represent a sizeable proportion of the public sector education and health care workforce. However, they are not counted as formal public employees in many administrative systems; that is often the reason for their contractual status. Given that contract workers are often exempt from budgetary limits on spending, their recruitment allows ministries to circumnavigate budgetary conditionalities against overspending on personnel.

This impairs the ability of governments to assess the true size of the public sector workforce. Further, given that these data sets are often unique to individual public sector organizations, the determination of who does or does not constitute a public sector worker may differ across organizations. Both of these factors would bias any estimate of the size of the public workforce, weakening the ability of governments to track wage bill spending. Survey data, on the other hand, are not limited by this distinction. Given that they are collected directly from individuals, who can elaborate on their sector employment, surveys can allow for a better determination of the size and structure of the public sector workforce.

Finally, household survey data are typically collected with research and diagnostic objectives in mind. Administrative data sets are collected for a variety of nonstatistical reasons, such as human resource management, program administration, or other regulatory or enforcement purposes. Therefore, administrative data in their "raw" form may not be suitable for statistical analysis.

Areas to Be Cautious in a Survey-Based Approach

It is important also to point to the caveats associated with the use of survey data. Labor force surveys can only generate insights into the nature and organization of public sector human resources with rich, complete, and consistent data collection on labor force participants, in general, and the public sector workforce, in particular. Given the self-reported nature of household surveys, respondents may not be able to fully articulate or comprehend nuances within their responses around the nature of their employment. While these surveys are designed and extensively piloted with particular care given to how questions may be interpreted, in order to ensure the quality of responses, there may be lingering imprecision within the variables that define individuals as working in specific sectors.

Utilizing a more broadly defined public sector identifier may make it easier for respondents to accurately answer relevant survey questions and allow for a more comprehensive comparative analysis between the public and private sectors. However, this may make the survey's definition of the public sector unfit for particular purposes. It is often difficult to differentiate between, for example, federal and state employees or those that are employed within specific ministries and those employed within state-owned enterprises.

The second area for caution is the respondents' representativeness of the underlying population of public and private sector workers. Labor force surveys, by definition, sample the working-age population. When designing the sampling frame, surveys often strive to ensure a representative sample in terms of age, gender, and racial and ethnic demographics. Some surveys aim to sample a representative share of employed and unemployed individuals and those not active in the labor force. However, they rarely if ever explicitly attempt to ensure a balanced sample of public and private sector workers. Analysts must thus assess whether the sampling approach might have biased data collection toward one or the other sector's employees or otherwise changed the nature of measurement in either sector.[2]

SETTING UP THE ANALYSIS

Capitalizing on Current Household Surveys

What features of a survey are necessary for it to be useful for government analytics? The answer to this question will be determined by the specific analysis intended. This chapter therefore follows the requirements of an analytical framework used by the World Bank to understand public and private sector labor markets in the development of the Worldwide Bureaucracy Indicators (WWBI). The WWBI is a unique cross-national data set on public sector employment and wages that utilizes global repositories of household survey data from 202 economies to present a globally consistent and analytically rigorous set of indicators across 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.[3]

WWBI indicators on public employment track key demographic characteristics, including the size of the public sector workforce (in absolute and relative numbers), the age of the workforce, and the distributions of employees across genders, industries, income quintiles, and academic qualifications. Compensation variables capture both the competitiveness of public sector wages (compared to the private sector) and wage differentials across industry or occupation, gender, education, and income quintile within the public and private sectors, as well as pay compression ratios in the public and private sectors.

What features of a survey make it eligible for inclusion in the WWBI, and, more broadly, what features are useful for the analytics of public and private labor markets? Since the WWBI focuses on national aggregates, the survey must be representative at the country level (rather than, for example, including just urban areas). Correspondingly, the survey must have taken a sampling approach that attempts to represent each unit of observation across the country equally. Beyond the WWBI, if analysts are only interested in public

sector labor markets in urban areas, the survey should have appropriately sampled within the requisite con-urbations of the country.

A second set of requirements relates to the size and composition of surveys included in the WWBI. Specifically, attention is paid to the sample sizes for major categories of respondents. The ability of the WWBI to properly characterize the public and private sector workforces is dependent on the underlying surveys' possessing large enough samples of these two categories of workers that any estimates would approximate the demographics and compensation of the actual labor forces they model. Within the WWBI framework, surveys with fewer than 200 observations for either labor market, or in which either labor market comprises less than 5 percent of all employed individuals within the survey, are excluded from the analysis. More broadly, any survey should be judged on its ability to enable statistically valid inferences on the underlying population.

Third, the survey should have a sufficient sample size for key variables, so as not to be dropped by the WWBI's quality filters. There are three sets of variables we use for the WWBI, presented in table 27.1. If a survey does not include any of the variables shaded in green in table 27.1 or has greater than 40 percent missing/miscoded observations for any of those variables, the survey is disregarded. If a survey is missing any of the variables shaded in blue or has greater than 40 percent missing/miscoded observations for any of those variables, the specific set of variables related to that module is excluded. The gray variables are additional variables that are not universally used in the construction of the WWBI variables, so we do not require them. However, those variables related to sampling are required if sampling weights were used. Finally, the unshaded variables are frequently used to investigate outliers and so are useful to have if available.[4]

The availability of the variables outlined in table 27.1 provides analysts with a basic setup for labor market analysis. Many such analyses look to compare contemporary results over time or across countries. This requires the availability and harmonization of variables across surveys. The WWBI aims to produce statistics that can be compared across time and space and thus faces issues of the classification of employees, the definition of the public sector, and the formulation of wages.

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

> all 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, flexitime and compensatory leave for overtime). (ILO 2013, 6)

Paid employment refers to a subsection of total employment and includes only salaried workers, excluding unpaid or own-account (commission-based) employees, employers, and those that are self-employed. Formal employment is a further subset of paid employment and counts those who are employed in formal occupations (possessing a written contract or having access to benefits like health insurance, pensions, or union membership).

A globally harmonized definition of the public sector is hindered due to issues of comparability emerging from the heterogeneous definition of public employees across countries. To avoid this, the WWBI, as a guiding principle, utilizes the more broadly defined *public sector* as opposed to *general government*, as defined by the International Monetary Fund (IMF) *Manual on Government Finance Statistics* (IMF 2014). Specifically, the public sector consists of all institutional units controlled by the central and subnational governments, as well as public corporations that are engaged in market-based activity. Utilizing this broader definition allows for a cleaner comparison across national surveys.

To make wage data as comparable as possible across surveys, the WWBI denotes only the income associated with the occupation used in the analysis (to which the individual dedicated most of their time in the

TABLE 27.1   Variables Required for the Inclusion of a Survey in the WWBI

Metadata variables
Survey ID
Country ID
Year of the survey
Month of the interview
Household ID
Individual ID
Household sampling weight
Strata
Primary sampling units ID
Demographics
Household size
Gender
Age
Urban/rural
Education module application age
Ever attended school
Attending school
Years of education
Level of education (no education, primary, secondary, tertiary)
Labor module
Labor module application age
Labor status • Employed • Unemployed • Not in labor force
Employment status • Paid employee • Unpaid employee • Employer • Self-employed • Other, workers not classifiable by status
Number of additional jobs
Sector of activity (public vs. private) • Public sector, central government, army, NGO, state-owned company • Private
Industry sector classification (minimum one-digit level, but three-digit level is required for occupational decomposition)
Occupational classification (minimum one-digit level, but three-digit level is required for occupational decomposition)
Wage module
Hours of work in the last week
Last wage payment

Source: Original table for this publication, based on World Bank 2021.
Note: The table shows the three sets of variables used. If a survey does not include any of the variables shaded in green or has greater than 40 percent missing/miscoded observations for any of those variables, the survey is disregarded. If a survey is missing any of the variables shaded in blue or has greater than 40 percent missing/miscoded observations for any of those variables, the specific set of variables related to that module is excluded. The gray variables are additional variables that are not universally used in the construction of the WWBI variables, so are not required. ID = identification; NGO = nongovernmental organization; WWBI = Worldwide Bureaucracy Indicators (World Bank).

week preceding the survey) and excludes bonuses, allowances, and other in-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 in most household surveys, the wages from the primary job are not net of taxes. For those who are self-employed or own their own businesses, this corresponds to net revenues (net of all costs excluding taxes) or the amount of salary withdrawn from the business.[5]

Wage information in the surveys is reported in each country's local currency units, with a diverse array of periodicity. Great care should be taken to identify the exact frequency of income for each individual within the surveys and convert all wages to a weekly (or another common unit of) wage after accounting for the varying hours worked to ensure credible comparisons across individuals and groups. Additionally, to control for the effect of possibly spurious outliers, the wage variables in the WWBI are winsorized by limiting extreme values in the survey data at the top 0.01 percent level.[6] More broadly, analysts may want to be cautious with wage information that seems like an outlier from the general distribution of a particular survey.

Overall, to be useful for government analytics, existing household surveys should have sufficient coverage of the population and relevant variables, be of sufficient size, and, where comparisons to international surveys are required, have questions appropriately harmonized with international standards. Fitting these criteria, individual country efforts can always be integrated into existing indicators, such as the WWBI, or compared with relevant surveys in other countries of interest.

Extending Data Collection

What if appropriate household surveys do not exist? Governments, independent organizations, or even individual analysts may be in a position to create and field such surveys. In many instances, project teams from the World Bank have run large, nationally representative household surveys themselves to collect information to aid policy guidance. In India, a private sector organization, the Centre for Monitoring Indian Economy (CMIE), complements the government's labor force survey. By operating the "world's largest household panel survey," with over 2 million individual respondents covering 236,000 households three times a year, the CMIE increases the frequency of up-to-date labor market data for the government and other stakeholders.[7]

Household surveys that are optimized for government analytics could solve the issues with representative sampling identified above by targeting populations of public and private sector workers in a way that ensures an equal probability of inclusion. Such sampling could be done at the subnational level and targeted at those sections of the labor market where the government is particularly prevalent or is aiming to emphasize recruitment. Information not typically collected by household surveys but of substantial interest to those aiming to understand public sector labor markets could be collected, such as information on perceptions of the public recruitment process at different levels of government and how features of the public sector (such as perceived wage and pension benefits) affect respondents' wider labor market choices. Finally, sector variables, such as what specific parts of the government a respondent works in (or its private sector comparator), would allow for analyses that are more precisely targeted at particular job categories.

INSIGHTS EMERGING FROM HOUSEHOLD SURVEYS

Such a systematic utilization of labor force data can allow for the delineation of unique stylized facts on public sector employment and compensation that can provide valuable insights for governments. This section provides illustrative examples of insights into the (relative) nature of government labor markets emerging from household surveys.

The Size of the Public Sector in the Overall Labor Market

A foundation stone of government analytics is the size of the public sector as a share of the national, regional, or local labor market. This topic relates to questions about the appropriate size of government and its impacts on private sector labor markets.

The WWBI reveals that the public sector is a major source of employment in most countries; often, it is the single largest employer. More specifically, the public sector accounts for an average of 16 percent of total employment and over 30 percent and 37 percent of paid and formal employment, respectively. The first metric measures the overall labor market footprint of the public sector, while the latter two are more precise measures of the public sector's relative size within the salaried and formal segments of the labor market.
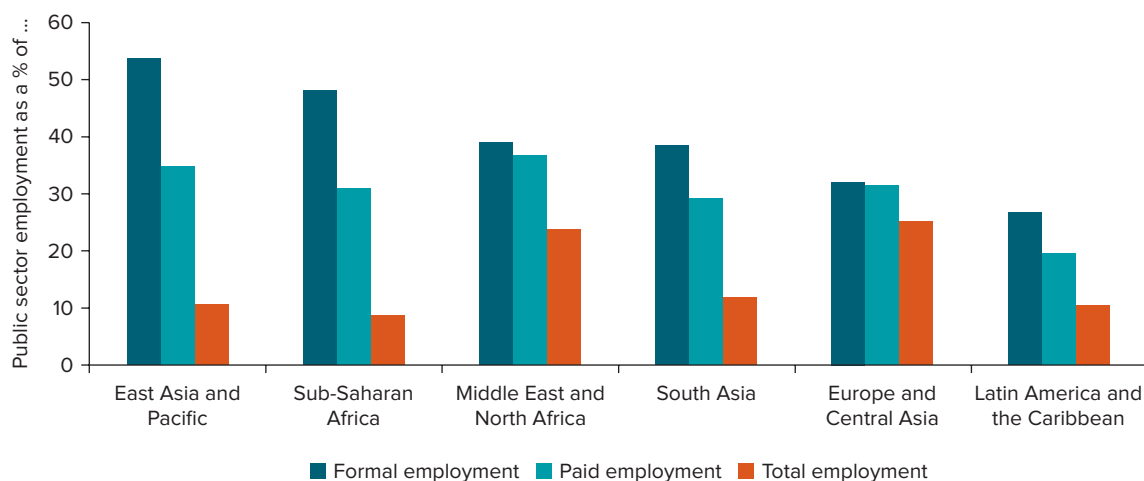
The size and importance of the public sector vary extensively by country income and region (see figure 27.1). While less than 9 percent of the total labor force of the average nation in Sub-Saharan Africa is employed in the public sector, the governments of the Middle East and North Africa employ a quarter of the entire labor force there. This difference is even more stark when looking at formal employment. Such comparisons can be made at the subnational level, allowing the government to develop a sense of how "imposing" its employment is as part of the total stock of formal jobs.

These basic statistics illustrate the wealth of information contained within household surveys that can help governments understand the importance of the public sector, not only as a provider of essential public services but as a key determinant of the health of labor markets, which can help practitioners make better-informed policy decisions.

Further, tracking these indexes over time can help governments understand how the share of the public sector has evolved over time. Figure 27.2 illustrates that, for the world as a whole, a convergence is taking place in terms of the relative size of the public sector. While the public sector's share within total employment has increased, public employment as a share of formal employment has steadily declined over the 18-year period studied.

The former is likely due to the fact that as countries develop, their public sectors are called upon to provide more and increasingly complicated services. Conversely, the decline in the public sector's importance within the formal labor force is in part driven by the increased penetration of formal contracting and benefits within the private sector. Regional analysis shows that the relative importance of the public sector within formal employment fell faster and further in middle-income countries than in high- or low-income countries, both of which experienced relatively slower growth rates of labor force productivity and per capita income (Cho et al. 2012).

FIGURE 27.1   Differences in Public Sector Employment, by Region, 2000–18

Source: Worldwide Bureaucracy Indicators, version 2.0, https://datacatalog.worldbank.org/search/dataset/0038132.

FIGURE 27.2 Relative Size of the Public Sector Workforce, 2000–18

Source: Worldwide Bureaucracy Indicators, version 2.0, https://datacatalog.worldbank.org/search/dataset/0038132.
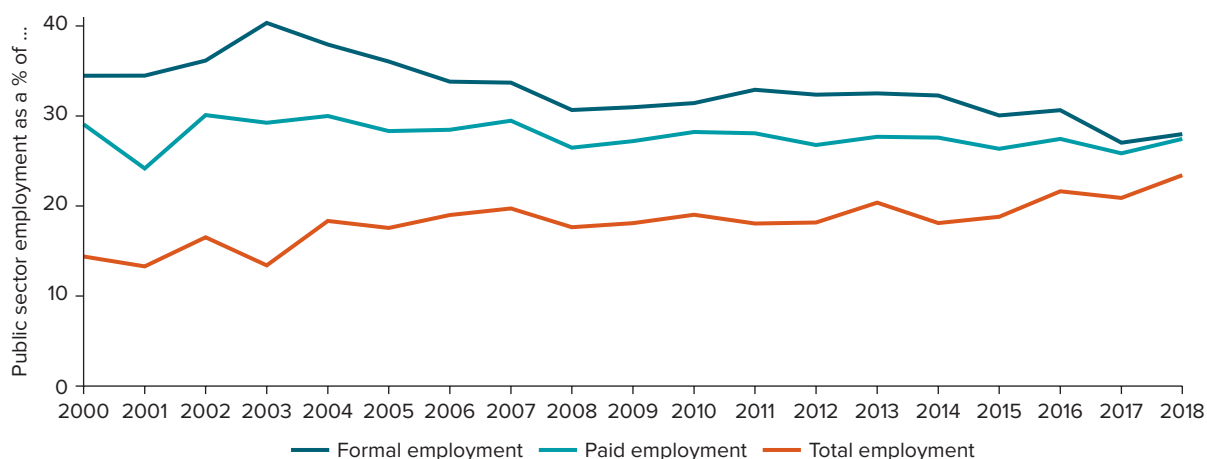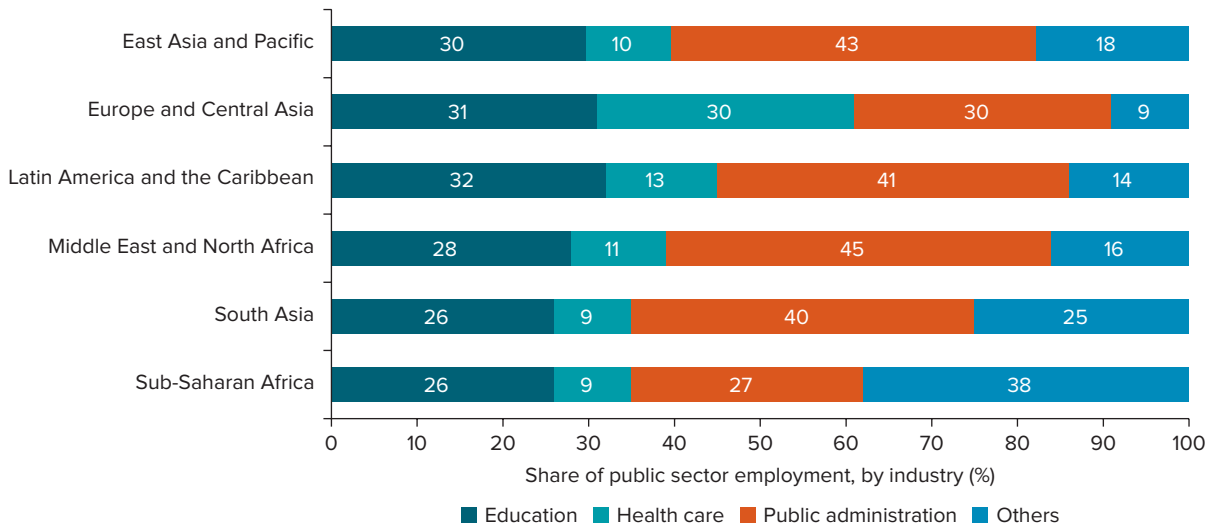
Moreover, household surveys allow policy practitioners to further disaggregate public employment by industry. Countries often have unique legal and occupational classifications for public sector employees, complicating cross-national comparisons. In some countries, all government employees are classified as civil servants, meaning they enjoy distinct legal protections. In others, only management and policy staff are categorized as civil servants, with others, particularly service delivery staff, enjoying fewer privileges and being governed by labor codes similar to private sector employees.

The WWBI reveals that the public administration workforce (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 segment of the public sector workforce in most countries. On average, 35 percent of the public sector workforce is employed in public administration, followed by the education and health care 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 (figure 27.3). The oversized nature of the health care sector within the Europe and Central Asia region is driven primarily by the extensive public health systems within countries in the European Union.

Additionally, the "other" category in figure 27.3 accounts for public sector employment in all remaining areas of economic activity, ranging from construction and infrastructure to the provision of public utilities, or workers employed within state-owned enterprises other than those involved in public administration, education, or health care provision. Here, countries within the Sub-Saharan Africa region are clear outliers, a phenomenon driven by large public sector penetration in the mining, manufacturing, and services sectors. Given the relatively lower levels of economic development in many countries within the region, this points to the important role that the public sector plays in countries with underdeveloped private sectors. Still, while there may not exist a universal formula for the ideal makeup of the public sector workforce, household surveys can allow a government to benchmark the organization of its public sector workforce across peer countries, or even historically, to track its evolution.
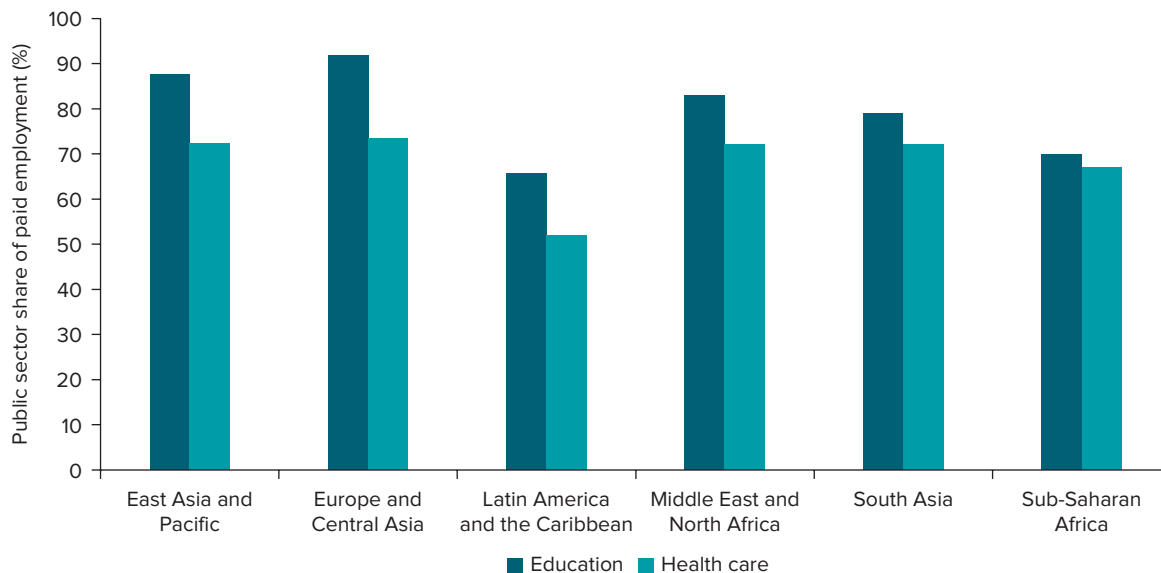
Education and health care workers are essential to a country's ability to meet its Sustainable Development Goals (SDGs) for the adequacy and universality of health care coverage and education provision. The share of the public sector devoted to the provision of social services differs with country incomes. Looking closely at the education and health care workforce through labor force surveys helps explain the importance of the public sector in the provision of these services. Globally, over three-fourths and two-thirds of the education and health care paid workforce are employed in the public sector, respectively (figure 27.4). This is, in part, driven by the importance that governments across the world place on the provision of education and health care as mandated by the SDGs. It is also partly due to the limited capacity within the private sector to satiate national demand for these services.

FIGURE 27.3   Areas of Economic Activity as a Segment of Public Employment, by Region, 2000–18

Region	Education	Health care	Public administration	Others
East Asia and Pacific	30	10	43	18
Europe and Central Asia	31	30	30	9
Latin America and the Caribbean	32	13	41	14
Middle East and North Africa	28	11	45	16
South Asia	26	9	40	25
Sub-Saharan Africa	26	9	27	38

Share of public sector employment, by industry (%)

■ Education ■ Health care ■ Public administration ■ Others

Source: Worldwide Bureaucracy Indicators, version 2.0, https://datacatalog.worldbank.org/search/dataset/0038132.

FIGURE 27.4   Public Sector Education and Health Care Employment, by Region, 2000–18

Source: Worldwide Bureaucracy Indicators, version 2.0, https://datacatalog.worldbank.org/search/dataset/0038132.

Both these segments of the workforce have seen significant attention in the aftermath of the COVID-19 pandemic, as frontline education and health care providers, academics and researchers, epidemiologists, public health experts, and engineers have been an essential bulwark against the public health crisis. Their importance and contribution cannot be overstated. Household surveys can shed light on the role that the public sector education and health care workforce plays within these two sectors. The WWBI finds substantial variation by region (as illustrated in figure 27.4). While over 91 percent of the education workforce and 73 percent of the health care workforce in the Europe and Central Asia region is employed in the public sector, the Latin America and the Caribbean region employs just under 66 percent and 52 percent of these workers, respectively.

The public sector is an important employer for workers with tertiary degrees. Given the particular focus that household surveys place on collecting information systematically on the academic qualifications of workers in the labor force, using globally harmonized measures of educational attainment, these surveys offer a window into the skills makeup of the public and private sector workforces. Looking at data from the WWBI, which tracks the qualifications of workers internationally, we can see that the public sector has a higher proportion of workers with tertiary degrees. Of public sector workers, 47 percent have a tertiary degree, compared to 21 percent in the private sector. (Figure 27.5 provides a dot plot of countries in the WWBI comparing the national shares of tertiary-educated workers in the public and private sectors.) These differences between public and private sector workers have implications for any comparative analysis between the two labor markets, especially public-private wage differentials.

The proportion of public sector workers with tertiary education varies by country income level. In low-income countries, 19 percent of public workers have either no or only primary education, while in high-income countries, this share is negligible. A high proportion of low-skilled workers points to the public sector's serving a social welfare function. A corollary to a high proportion of low-skilled workers is a high proportion of clerical or support jobs. At the other end of the education spectrum, the share of employees with a tertiary degree has increased globally by around 20 percentage points in both sectors over the past decade, but the public sector continues to employ more workers with degrees.

By generating comparative information on the two sectors, possibly over time and across regions and countries, household surveys allow government analysts to understand the broad features of the public sector labor market and the role of the public sector in various national labor markets. A growing body of literature confirms this ability and the importance of the public sector in employing high-skilled workers (Gindling et al. 2020; Grindle and Hilderbrand 1995; Tummers and Knies 2013). Labor force surveys are thus well positioned to enable coherent international comparisons that provide benchmarks to assess a country's current state and dynamics.

Understanding Gender Discrimination

The public sector is an important source of formal employment for women. The public sector's large labor market footprint means that it can be a strategic leader in changing norms and behaviors and promoting

FIGURE 27.5 Tertiary Education among Public and Private Sector Workers, by Region, 2000–18
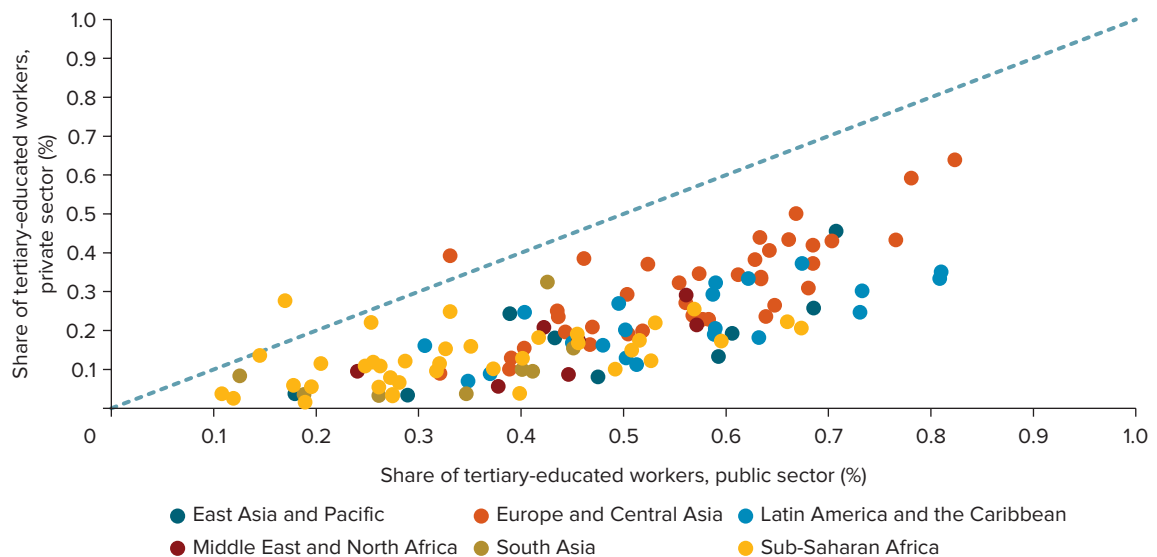
Source: Worldwide Bureaucracy Indicators, version 2.0, https://datacatalog.worldbank.org/search/dataset/0038132.
Note: There is no estimate for the private sector in North America, so the region is not included in the graph.

greater equality in employment in the overall labor market. However, understanding the current state of women's participation in differential labor markets requires detailed information on the quality of gender representation in the public and private sectors.

In many developing countries, the public sector, in general, and the education and health care sectors, in particular, have been among the few options for formal employment available to women (Yassin and Langot 2018). Globally, women represent 46 percent of the public sector workforce, compared to 33 percent of the private sector workforce. (Figure 27.6 provides a dot plot of countries in the WWBI comparing the national shares of public and private sector workers who are women.) 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.

Female representation in the public sector is strongly correlated with country income. A large body of literature finds a U-shaped relationship between female employment in the private sector and economic development (Goldin 1995; Goldin and Polachek 1987).[8] Labor force surveys included in the WWBI help provide evidence for a positive and significant relationship between female participation in the public workforce and country income. Multiple factors influence female participation rates in the labor force.[9] A growing body of literature confirms the positive relationship between 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), improvements in student performance (Zhang 2019), and improvements in public sector productivity (Andrews et al. 2005; Park 2013).

The Appropriateness of Public Sector Wages

Public sector wages are an important determinant of personnel quality and motivation and, therefore, a key determinant of state capacity. However, what is the appropriate level and structure of these wages? 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

FIGURE 27.6 Share of Female Workers in the Public versus Private Sector, by Region, 2000–18
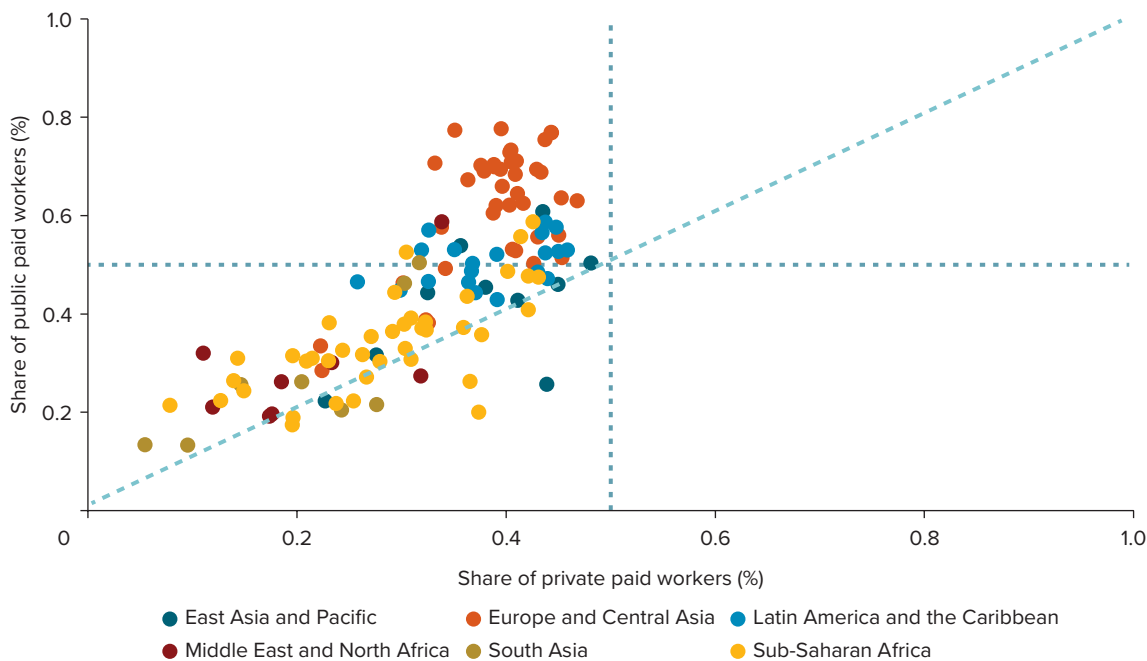
Source: Worldwide Bureaucracy Indicators, version 2.0, https://datacatalog.worldbank.org/search/dataset/0038132.
Note: The diagonal dashed line represents equity between the two sectors. There is no estimate for the private sector in North America, so the region is not included in the graph.

within a particular country, given that the most likely outside option to employment in the public sector is the corresponding private sector. Estimating public-private wage differentials within a country has been explored in a very large body of academic and policy literature.[10]
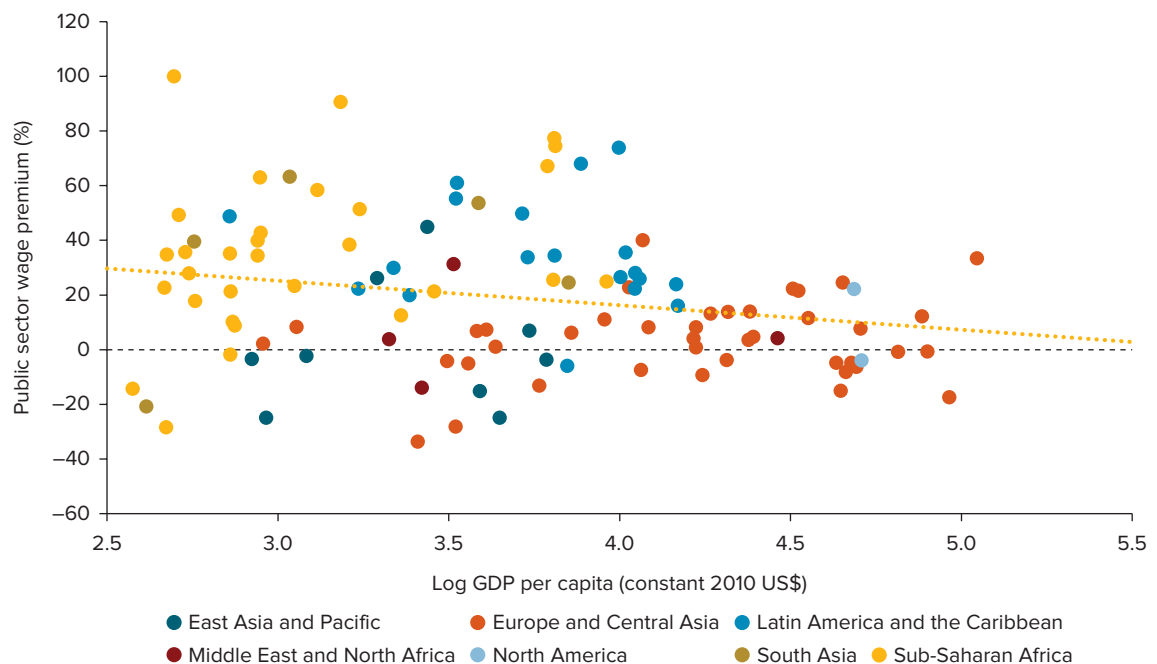
The second approach involves comparing the wages of public sector workers in one country with those of similar workers in other (comparable) countries. Given that these are the closest counterparts to one country's public sector workforce, this is another important method for estimating whether public servants in one country are over- or underpaid. These comparisons are particularly useful in the case of industries or occupations in which workers have transferable skills, such as health care workers who migrate internationally or workers in clerical or managerial positions who rotate within the public sector.

A third option is to compare individuals who perform different tasks or are employed in different occupations within the same country's public sector. This may be useful if public servants are able to move across the service from one organization or region to another.

Household surveys enable each of the above approaches, and such analysis has been undertaken in the WWBI. The data set indicates that public employees in most nations receive a wage premium compared to their counterparts in the private sector. Figure 27.7 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, level of education, and location). The figure is ordered by log GDP per capita to provide an indicative sense of premia vary with economic wealth. Public sector workers have approximately 19 percent higher basic wages (excluding allowances and bonus payments) across the 111 countries for which household surveys were sourced, 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 income, a finding corroborating academic studies that report higher premiums for developing countries (Finan, Olken, and Pande 2017).

It is important for the government to understand how wage premiums are distributed across worker groups. The public sector wage premium is not uniform and varies by personnel characteristics.

**FIGURE 27.7** Public Sector Wage Premium Compared to Country Income, by Region, 2000–18

Source: Worldwide Bureaucracy Indicators, version 2.0, https://datacatalog.worldbank.org/search/dataset/0038132.

The magnitude of the public sector wage premium depends on an employee's educational qualifications and is lowest for tertiary-educated officials. The main reason that tertiary-educated individuals earn a low, or no, premium compared to private sector workers is the ability to earn greater wages in the private sector. Similarly, the large wage premium for women in the public sector has greater implications for the large gender pay gaps that exist in the private sector.

While the wage differentials between typical public and private sector workers presented above are worthy of attention from public officials in terms of their impact on the competitiveness of wages in the public sector, the public sector workforce represents a specific subset of the national labor force as employment. Public sector workers are concentrated within a handful of industries (public administration, education, and health care) and certain occupational groups (including managerial, professional, and clerical occupations). Therefore, a second, equally important element of the public sector wage structure for government officials is the difference in wages for workers in different segments of the public sector workforce. Studies have shown that workers compare their wages with their peers in an organization, just as they do with the private sector, and wage differentials that are not perceived as justifiable can be demotivating (Borjas 2002). 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 are data in the WWBI (figure 27.8). The average wage compression ratio for the public sector across 101 countries is 4.9, compared to 6.3 in the private sector. The lower dispersion in the public sector reveals a trade-off between equity and pay competitiveness at the top of the salary distribution that governments manage. Such information can help public sector managers determine new wage schedules aimed at attracting and maintaining a cadre of high-skilled functionaries in the public sector.

FIGURE 27.8 **Public versus Private Sector Pay Compression Ratios, 2000–18**
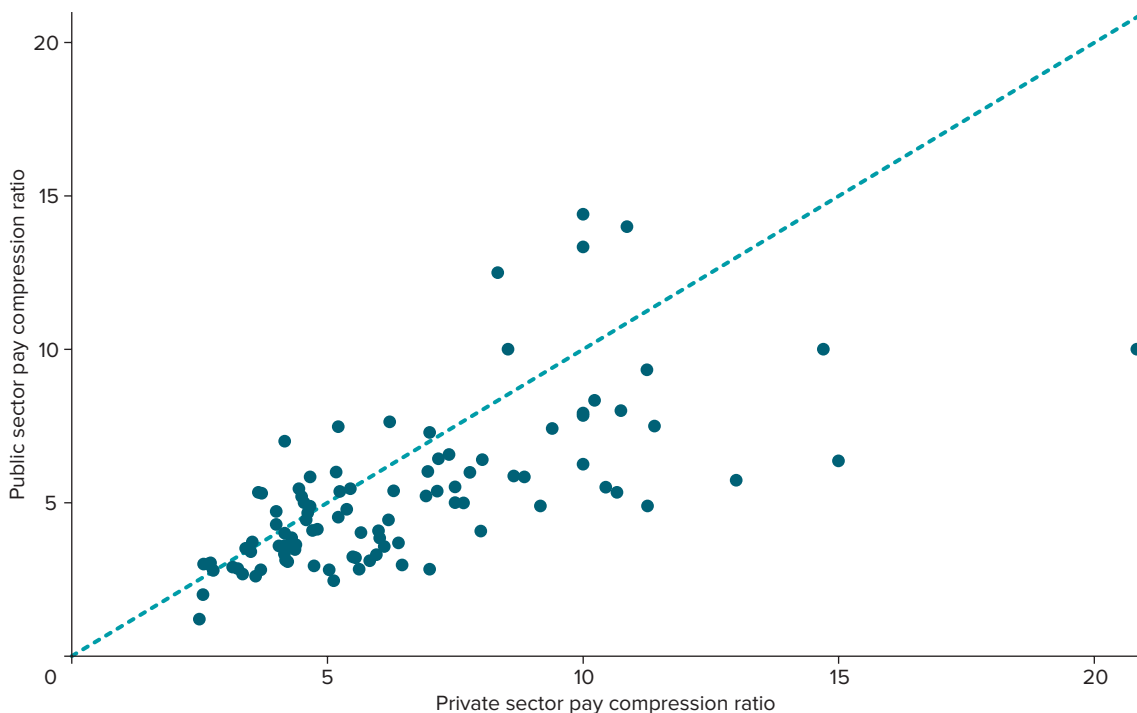
Source: Worldwide Bureaucracy Indicators, version 2.0, https://datacatalog.worldbank.org/search/dataset/0038132.
Note: Each dot represents a country.

FIGURE 27.9 Pay Inequity in the Brazilian Public Sector, 2020
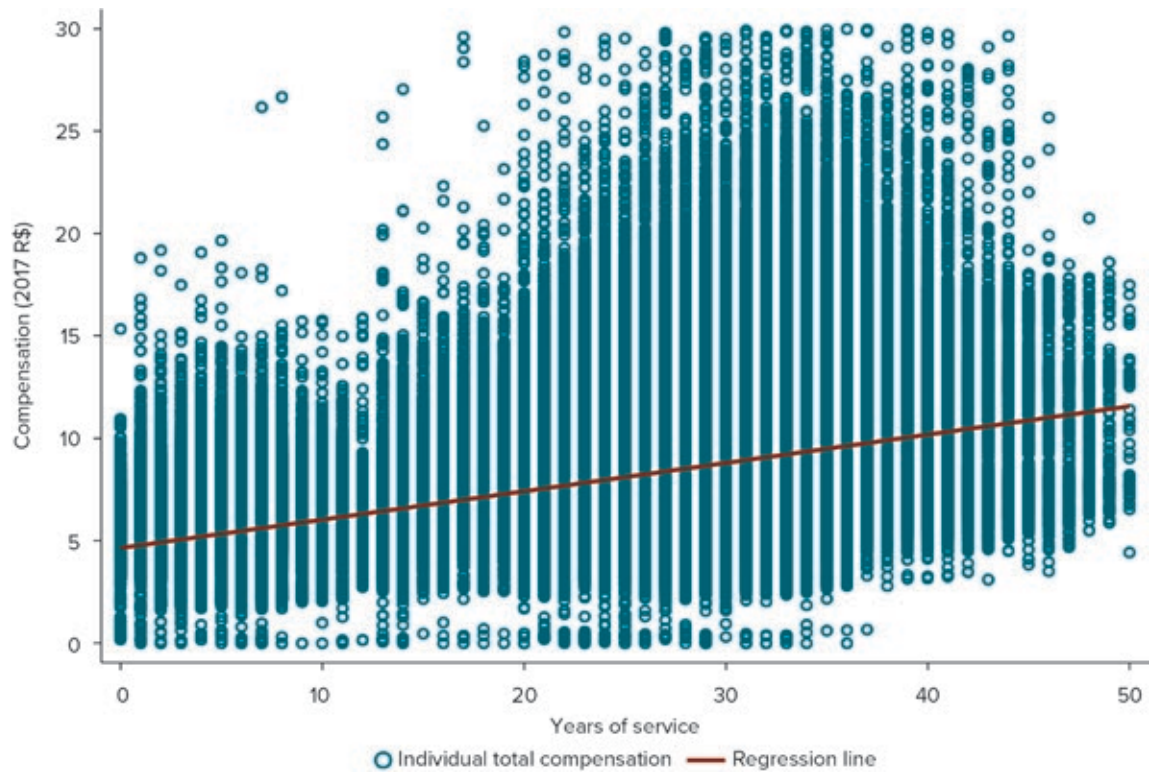

Source: World Bank 2020.
Note: Each dot represents an employee.

Household surveys are also able to provide information on the degree of unexplained variation in wages for individuals employed within similar occupations in the public sector. Figure 27.9 shows that the gross pay received can vary tenfold for workers with similar levels of experience, which is largely a result of non-performance-related payments and not basic pay. While these differences may, in part, be due to personnel demographics (age, gender, or educational qualifications) or the nature of work (job family, industry, or scale), this does point to public sector wages being weakly associated with the experience of workers. Still, these wage differences across employees performing similar tasks and of similar grades but working in different locations or organizations can potentially act as distortions in the workforce.

Understanding Regional Variation

To further illustrate the power of household surveys, if sample sizes are sufficiently large and survey sampling is appropriately stratified, this analytical approach can be replicated at subnational levels. For example, the team has applied the methodology to analyzing public and private sector labor markets at the provincial level in Indonesia. Two variables from this effort are illustrated for Indonesia's provinces in map 27.1. These efforts allow for a closer understanding of regional disparities in the scale, composition, and compensation of the public and private sectors across administrative divisions within countries. In the case of Indonesia, for example, the public sector comprises almost 60 percent of paid employment in the eastern provinces of East Nusa Tenggara, North Maluku, West Papua, and Papua, compared to less than 15 percent in the western provinces (map 27.1, panel a). The female share of public sector employment (which stands at 44 percent at the national level) is mostly concentrated in the eastern and central provinces (map 27.1, panel b). Stylized facts like these can help shed light on many aspects of the nature of public and private labor markets across subnational units within a country.

MAP 27.1   Subnational Patterns in Public Sector Employment, Indonesia, 2018

a. Public sector employment as a share of paid employment

Percent
60
15

b. Female share of public paid employment

Percent
58
31
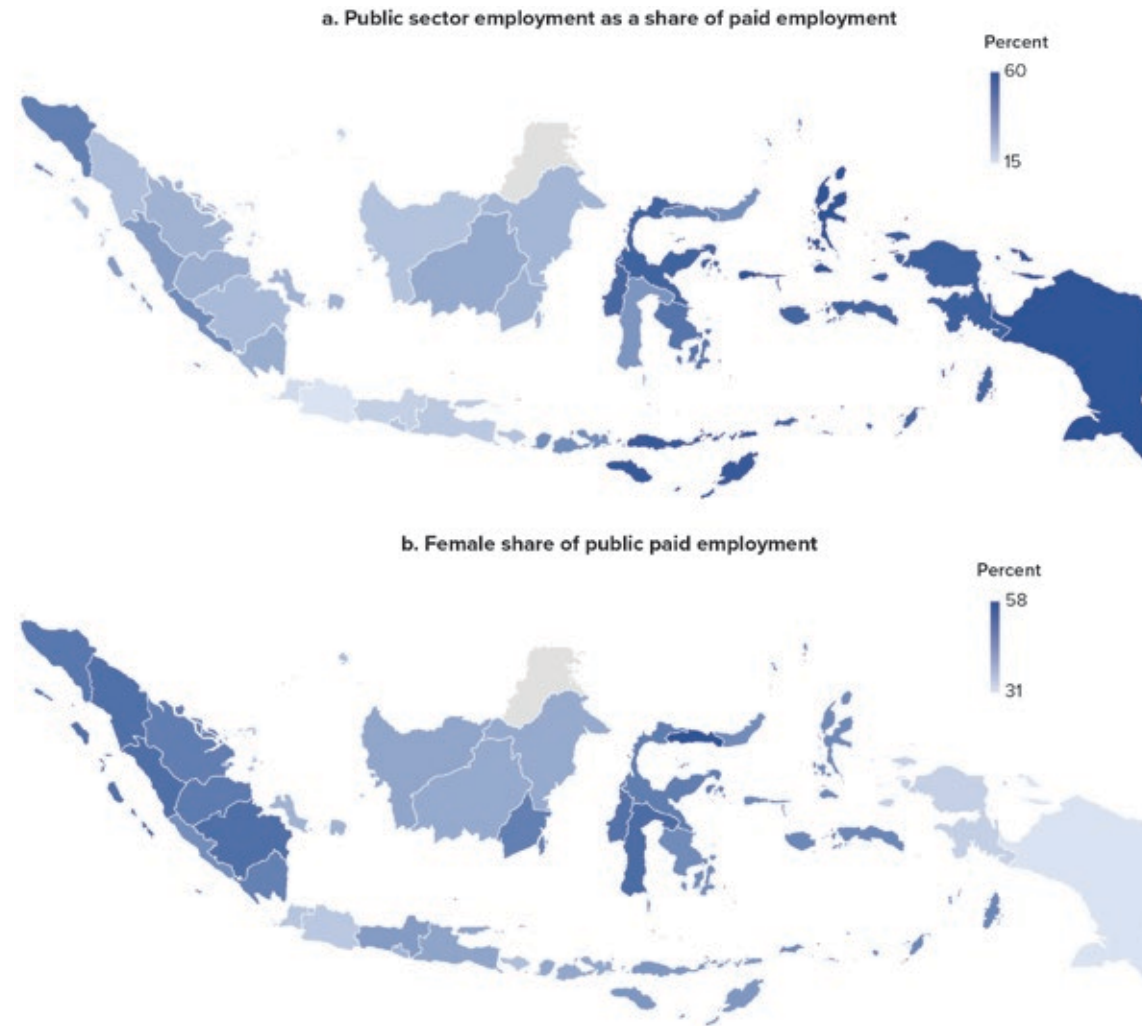
Source: Original maps for this publication, based on household survey data.

CONCLUSION

We have presented a microdata-based approach for governments to improve their understanding of the public sector workforce and labor markets. Such understanding helps in the development of empirically grounded public service compensation and employment strategies. We have demonstrated how government analysts can use existing household surveys to generate novel insights into government and how these lead to insights that can allow policy makers to make better fiscal choices. Thus, the range of data that should be included for consideration in human resources management information systems, outlined in chapter 9, includes household surveys. Capitalizing on household surveys for government analytics provides a powerful complement to payroll analysis (as described in chapter 10) and broader budget analytics.

These kinds of analytics matter for the effective management of the state, but they also matter for the impact of the public sector on private sector labor markets. 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 while not creating disequilibria in private sector labor markets through queuing and crowding effects. 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.

We have used a series of examples from the World Bank's WWBI to demonstrate how the use of household survey data can help policy makers gain insight into the current and future state of their government's employment and compensation policies. This approach enables researchers, development practitioners, and policy makers to answer some of the most important questions about 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.

NOTES

The approach laid out here leverages the methodological and operational guidelines followed by the Bureaucracy Lab in the construction of the World Bank's Worldwide Bureaucracy Indicators (WWBI), a novel cross-national data set on public and private sector employment and compensation practices. The data set was derived from over 1,000 nationally representative household surveys from 202 countries and territories between 2000 and 2020, providing over 300 granular indicators on the composition, demographics, and compensation of public sector workers. However, this chapter goes beyond that effort to showcase how such an approach can be replicated by researchers, development practitioners, and policy makers to gain a better understanding of the personnel dimensions of state capability, the footprint of the public sector within the overall labor market, and the fiscal implications of the public sector wage bill.

1. There are notable exceptions, such as the Brazilian Ministry of Labor and Employment's Relação Anual de Informações Sociais (RAIS) data set, which contains information about employees and businesses for 97 percent of the Brazilian formal market.
2. To counteract these two concerns, governments can limit the presence of these biases in two ways. First, they can ensure that the selection of respondents is based on high-quality census data that guarantee that the sample selected is a good representation of the overall population of the country and, more importantly, is a realistic representation of labor force participants in the public and private sectors. Second, they can look to surveys that include tens of thousands (or an even higher number) of respondents to ensure that any potential weakness in sample selection is alleviated through a large sample size.
3. Further details on the construction of the WWBI are available in a technical note (World Bank 2022). The WWBI data set can be accessed online here: https://datacatalog.worldbank.org/search/dataset/0038132. WWBI data are displayed in a dashboard viewable at https://databank.worldbank.org/source/worldwide-bureaucracy-indicators-(wwbi). The underlying analytical code has also been made available in the World Bank's repository on GitHub at https://github.com/worldbank/Worldwide-Bureaucracy-Indicators.
4. The thresholds used by the WWBI are a product of empirical investigation into the robustness of the indicators to different levels of missingness. More details are provided in the various technical reports accompanying distinct versions of the WWBI (see, for instance, World Bank 2022).
5. Certain surveys do include information on work benefits, such as health insurance and social security, but these are not monetized and cannot be added to wages to provide an estimate of total compensation.
6. *Winsorizing* or *winsorization* is the transformation of statistics by limiting extreme values in the statistical data to reduce the effect of possibly spurious outliers.
7. More information about the CMIE is available on its website, accessible at https://consumerpyramidsdx.cmie.com/.
8. Female participation is the highest in low-income countries, falling as countries industrialize, and increasing again at high levels of economic development, as the services sector grows.
9. See Jayachandran (2021) for a rich discussion of this literature.
10. See Bales and Rama (2001), Bargain, Etienne, and Melly (2018), Campos et al. (2017), Christophides and Michael (2013), Coppola and Calvo-Gonzalez (2014), Gibson (2009), and Lausev (2014).

REFERENCES

Andrews, Rhys, George A. Boyne, Kenneth J. Meier, Laurence J. O'Toole, and Richard M. Walker. 2005. "Representative Bureaucracy, Organizational Strategy, and Public Service Performance: An Empirical Analysis of English Local Government." *Journal of Public Administration Research and Theory* 15 (4): 489–504.

Arizti, Pedro, Daniel J. Boyce, Natalia Manuilova, Carlos Sabatino, Roby Senderowitsch, and Ermal Vila. 2020. *Building Effective, Accountable, and Inclusive Institutions in Europe and Central Asia: Lessons from the Region.* Washington, DC: World Bank. http://hdl.handle.net/10986/34031.

Baig, Faisal Ali, Xu Han, Zahid Hasnain, and Daniel Rogger. 2021. "Introducing the Worldwide Bureaucracy Indicators: A New Global Dataset on Public Sector Employment and Compensation." *Public Administrative Review* 81 (3): 564–71.

Bales, Sarah, and Martin Rama. 2001. "Are Public Sector Workers Underpaid? Appropriate Comparators in a Developing Country." Policy Research Working Paper 2747, World Bank, Washington, DC. http://hdl.handle.net/10986/19338.

Bargain, Olivier, Audrey Etienne, and Blaise Melly. 2018. "Public Sector Wage Gaps over the Long-Run: Evidence from Panel Administrative Data." IZA Discussion Paper 11924, Institute of Labor Economics, Bonn, Germany. https://www.iza.org/publications/dp/11924/public-sector-wage-gaps-over-the-long-run-evidence-from-panel-administrative-data.

Behar, Alberto, and Junghwan Mok. 2013. "Does Public-Sector Employment Fully Crowd Out Private-Sector Employment?" IMF Working Paper WP/13/146, International Monetary Fund, Washington, DC.

Borjas, George J. 2002. "The Wage Structure and the Sorting of Workers into the Public Sector." NBER Working Paper 9313, National Bureau of Economic Research, Cambridge, MA.

Campos, Maria M., Domenico Depalo, Evangelia Papapetrou, Javier J. Pérez, and Roberto Ramos. 2017. "Understanding the Public Sector Pay Gap." *IZA Journal of Labor Policy* 6 (7). https://doi.org/10.1186/s40173-017-0086-0.

Cho, Yoonyoung, David N. Margolis, David Newhouse, and David A. Robalino. 2012. "Labor Markets in Low and Middle-Income Countries: Trends and Implications for Social Protection and Labor Policies." Social Protection and Labor Discussion Paper 1207, World Bank, Washington, DC.

Christophides, Louis N., and Maria Michael. 2013. "Exploring the Public-Private Sector Wage Gap in European Countries." *IZA Journal of European Labor Studies* 2 (15). https://doi.org/10.1186/2193-9012-2-15.

Coppola, Andrea, and Oscar Calvo-Gonzalez. 2014. "Higher Wages, Lower Pay: Public vs. Private Sector Compensation in Peru." Policy Research Working Paper 5858, World Bank, Washington, DC. https://doi.org/10.1596/1813-9450-5858.

Finan, F., B. Olken, and R. Pande. 2017. "The Personnel Economics of the Developing State." In *Handbook of Economic Field Experiments*, vol. 2, edited by Abhijit Vinayak Banerjee and Esther Duflo, 467–514. https://doi.org/10.1016/bs.hefe.2016.08.001.

Gibson, John. 2009. "The Public Sector Pay Premium, Compensating Differentials and Unions: Propensity Score Matching Evidence from Australia, Canada, Great Britain and the United States." *Economics Bulletin* 29 (3): 2325–32.

Gifford, Brian. 2006. "The Camouflaged Safety Net: The U.S. Armed Forces as Welfare State Institution." *Social Politics: International Studies in Gender, State and Society* 13 (3): 372–99.

Gindling, T. H., Zahid Hasnain, David Newhouse, and Rong Shi. 2020. "Are Public Sector Workers in Developing Countries Overpaid? Evidence from a New Global Dataset." *World Development* 126: 104737. https://doi.org/10.1016/j.worlddev.2019.104737.

Goldin, Claudia. 1995. "The U-Shaped Female Labor Force Function in Economic Development and Economic History." In *Investment in Women's Human Capital,* edited by T. P. Schultz, 61–90. Chicago: University of Chicago Press.

Goldin, Claudia, and S. Polachek. 1987. "Residual Differences by Sex: Perspectives on the Gender Gap in Earnings." *American Economic Review* 77 (2): 143–51.

Grindle, Merilee S., and Mary E. Hilderbrand. 1995. "Building Sustainable Capacity in the Public Sector: What Can Be Done?" *Public Administration and Development* 15 (5): 441–63.

Hasnain, Zahid, Daniel Rogger, John Walker, Kerenssa Mayo Kay, and Rong Shi. 2019. *Innovating Bureaucracy for a More Capable Government.* Washington, DC: World Bank.

ILO (International Labour Organization). 2013. *Resolution Concerning Statistics of Work, Employment and Labour Underutilization.* Adopted by the 19th International Conference of Labour Statisticians, Geneva, October 2–11, 2013. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_230304.pdf.

IMF (International Monetary Fund). 2014. *Government Finance Statistics Manual 2014.* Washington, DC: International Monetary Fund. https://www.imf.org/external/Pubs/FT/GFS/Manual/2014/gfsfinal.pdf.

Ingraham, Patricia W., Philip G. Joyce, and Amy Kneedler Donahue. 2003. *Government Performance: Why Management Matters.* Baltimore, MD: Johns Hopkins University Press.

Jayachandran, Seema. 2021. "Social Norms as a Barrier to Women's Employment in Developing Countries." *IMF Economic Review* 69 (3): 576–95.

Johnston, Kate, and John Houston. 2016. "Representative Bureaucracy: Does Female Police Leadership Affect Gender-Based Violence Arrests?" *International Review of Administrative Sciences* 84 (1): 3–20.

Lausev, Jelena. 2014. "What Has 20 Years of Public-Private Pay Gap Literature Told Us? Eastern European Transitioning vs. Developed Economies." *Journal of Economic Surveys* 8 (3): 516–50.

Moynihan, Donald, and Ivor Beazley. 2016. *Toward Next-Generation Performance Budgeting: Lessons from the Experiences of Seven Reforming Countries.* Washington, DC: World Bank.

Park, Sanghee. 2013. "Does Gender Matter? The Effect of Gender Representation of Public Bureaucracy on Governmental Performance." *American Review of Public Administration* 43 (2): 221–42.

Rasul, Imran, and Daniel Rogger. 2018. "Management of Bureaucrats and Public Service Delivery: Evidence from the Nigerian Civil Service." *The Economic Journal* 128 (608): 413–46.

Tummers, Lars G., and Eva Knies. 2013. "Leadership and Meaningful Work in the Public Sector." *Public Administration Review* 73 (6): 859–68.

World Bank. 2020. "Brazil: Public Sector Wage Bill and Personnel Management." Unpublished manuscript. Washington, DC: World Bank.

World Bank. 2021. *Worldwide Bureaucracy Indicators Version 2.0: Codebook and Explanatory Note.* Last updated May 26, 2021. Washington, DC: World Bank. https://datacatalog.worldbank.org/int/search/dataset/0038132/Worldwide%20 Bureaucracy%20Indicators?version=2.

Yassin, Shaimaa, and François Langot. 2018. "Informality, Public Employment and Employment Protection in Developing Countries." *Journal of Comparative Economics* 46 (1): 326–48.

Zhang, Youlang. 2019. "Representative Bureaucracy, Gender Congruence, and Student Performance in China." *International Public Management Journal* 22 (2): 321–42.