



IMF Working Paper

Quality of Government and Living Standards: Adjusting for the Efficiency of Public Spending

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Abstract

It is generally acknowledged that the government's output is difficult to define and its value is hard to measure. The practical solution, adopted by national accounts systems, is to equate output to input costs. However, several studies estimate significant inefficiencies in government activities (i.e., same output could be achieved with less inputs), implying that inputs are not a good approximation for outputs. If taken seriously, the next logical step is to purge from GDP the fraction of government inputs that is wasted. As differences in the quality of the public sector have a direct impact on citizens' effective consumption of public and private goods and services, we must take them into account when computing a measure of living standards. We illustrate such a correction computing *corrected* per capita GDPs on the basis of two studies that estimate efficiency scores for several dimensions of government activities. We show that the correction could be significant, and rankings of living standards could be re-ordered as a result.

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I. INTRODUCTION

“Citizens, especially poor people, who ultimately consume the education and health services generated by the public system are the clients. They have a direct relationship with frontline service providers, such as teachers in public schools and health care workers in public health facilities—the short route of accountability. Crucially, however, the service providers generally have no direct accountability to the consumers, unlike in a market transaction. Instead, they are accountable only to the government that employs them. The accountability route from consumers to service providers is therefore through the government—the long route. To hold service providers accountable for the quantity and quality of services provided, citizens must act through the government a process that is difficult for poor people especially because they can seldom organize themselves and be heard by policy makers. Moreover, the government rarely has enough information or indeed the mechanisms to improve service provider performance.” *Global Monitoring Report*, World Bank, 2011; page 74.

Despite its acknowledged shortcomings, GDP per capita is still the most commonly used summary indicator of living standards. Much of the policy advice provided by international organizations is based on macroeconomic magnitudes as shares of GDP, and framed on cross-country comparisons of per capita GDP. However, what GDP does actually measure may differ significantly across countries for several reasons. We focus here on a particular source for this heterogeneity: the quality of public spending. Broadly speaking, the ‘quality of public spending’ refers to the government’s effectiveness in transforming resources into socially valuable outputs. The opening quote highlights the disconnect between spending and value when the discipline of market transactions is missing.

Everywhere around the world, non-market government accounts for a big share of GDP² and yet it is poorly measured—namely the value to users is assumed to equal the producer’s cost. Such a framework is deficient because it does not allow for changes in the amount of output produced per unit of input, that is, changes in productivity (for a recent review of this issue, see Atkinson and others, 2005). It also assumes that these inputs are fully used. To put it another way, standard national accounting assumes that government activities are on the best practice frontier. When this is not the case, there is an overstatement of national production. This, in turn, could result in misleading conclusions, particularly in cross-country comparisons, given that the size, scope, and performance of public sectors vary so widely.

Moreover, in the national accounts, this attributed non-market (government and non-profit sectors) “value added” is further allocated to the household sector as “actual consumption.” As Deaton and Heston (2008) put it: “[...] there are many countries around the world where government-provided health and education is inefficient, sometimes involving mass absenteeism by teachers and health workers [...] so that such ‘actual’ consumption is

² Note that public expenditure (which includes transfers) is a different concept than the public sector’s contribution to GDP (which excludes transfers). For instance, in France, in 2003, while the former amounted to 54 percent of GDP, the latter was a smaller 16 percent of GDP as social transfers (including pensions) are a substantial share of French public spending (see, e.g., Lequiller and Blades, 2006).

anything but actual. To count the salaries of AWOL³ government employees as ‘actual’ benefits to consumers adds statistical insult to original injury.” This “statistical insult” logically follows from the United Nations System of National Accounts (SNA) framework once ‘waste’ is classified as income—since national income must be either consumed or saved. Absent teachers and health care workers are all too common in many low-income countries (Chaudhury and Hammer, 2004; Kremer and others, 2005; Chaudhury and others, 2006; and World Bank, 2004). Beyond straight absenteeism, which is an extreme case, generally there are significant cross-country differences in the quality of public sector services. World Bank (2011) reports that in India, even though most children of primary-school age are enrolled in school, 35 percent of them cannot read a simple paragraph and 41 percent cannot do a simple subtraction.

It must be acknowledged, nonetheless, that for many of government’s non-market services, the output is difficult to define, and without market prices the value of output is hard to measure. It is because of this that the practical solution adopted in the SNA is to equate output to input costs. This choice may be more adequate when using GDP to measure economic activity or factor employment than when using GDP to measure living standards.

Moving beyond this state of affairs, there are two alternative approaches. One is to try to find indicators for both output quantities and prices for direct measurement of some public outputs, as recommended in SNA 93 (but yet to be broadly implemented). The other is to correct the input costs to account for productive inefficiency, namely to purge from GDP the fraction of these inputs that is wasted. We focus here on the nature of this correction. As the differences in the quality of the public sector have a direct impact on citizens’ effective consumption of public and private goods and services, it seems natural to take them into account when computing a measure of living standards.

To illustrate, in a recent study, Afonso and others (2010) compute public sector efficiency scores for a group of countries and conclude that “[...] the highest-ranking country uses one-third of the inputs as the bottom ranking one to attain a certain public sector performance score. The average input scores suggest that countries could use around 45 per cent less resources to attain the same outcomes if they were fully efficient.” In this paper, we take such a statement to its logical conclusion. Once we acknowledge that the same output could be achieved with less inputs, output value cannot be equated to input costs. In other words, *waste* should not belong in the living-standards indicator—it still remains a cost of government but it must be purged from the *value* of government services. As noted, this adjustment is especially relevant for cross-country comparisons.

The remainder of this paper is structured as follows. Section II discusses the measurement of living standards and the measurement of waste. Section III illustrates the empirical size this correction for waste would entail, and Section IV concludes.

³ AWOL is an acronym meaning: ‘absent without official leave.’

II. MEASURING LIVING STANDARDS

Per capita Gross National Income (GNI)⁴ is the statistic that defines who is who in development rankings. The World Bank uses it to classify economies in groups. For a country to be eligible for international development assistance⁵ (e.g., services which include grants and low-cost loans), it must satisfy two criteria, one of which is the relative poverty defined as GNI per capita below an established threshold that is updated annually. The cutoff for fiscal year 2011 is a 2009 GNI per capita of US\$1,165. Likewise, to be eligible for International Bank for Reconstruction and Development (IBRD) lending, in 2011, a country must have a 2009 GNI per capita of between US\$1,165 and US\$6,885.⁶

While, under general circumstances, the GDP may be a suitable indicator for tracking economic activity for a given country over time,⁷ its shortcomings in measuring economic welfare are well known. As it is often pointed out, GDP does not, for example, capture differences in leisure or in longevity; it does not reflect differences in inequality or in poverty; and it does not take into account the effect of economic activity on the environment. This has led to alternative attempts to enlarge the concept of GDP, one of the earliest being the “Measure of Economic Welfare” developed by Nordhaus and Tobin (1971). The recent *Report by the Commission on the Measurement of Economic Performance and Social Progress* prepared for the French government by Stiglitz and others (2010) presents an insightful up-to-date summary of the issues.⁸ Some of the report’s main recommendations include (i) using net income- or consumption-based measures, together with wealth, rather than gross production-based aggregates, (ii) to broaden measures to non-market activities, and (iii) to consider a dashboard of indicators for the quality of life, environment, and sustainability. In addition, in the context of the public sector, many government activities (e.g., police, defense, sanitation services, road maintenance) are intermediate inputs⁹ for production activities rather than genuine final outputs. Government services used by firms are called ‘instrumental expenditures’ in Nordhaus and Tobin (1971). Similarly, in the private sphere, commuting to work would also be an ‘instrumental expenditure.’ These *instrumental expenditures* should be appropriately deducted from the aggregate measure of net income. Several government functions that provide public-goods—e.g., justice and defense—are arguably better classified as instrumental expenditures rather than goods and

⁴ Gross National Income (GNI) differs from Gross Domestic Product (GDP) by the net factor income of nationals (net primary income from rest of the world). Adding official transfers and remittances (net current transfers from the rest of the world) we obtain Gross National Disposable Income (GNDI). All the issues that we raise pertaining to the measurement of GDP apply to the measurement of GNI.

⁵ The International Development Association (IDA) is the part of the World Bank that helps the world’s poorest countries. It currently provides the world’s poorest 79 countries with interest-free loans and grants.

⁶ See <http://data.worldbank.org/about/country-classifications>.

⁷ Nonetheless, for new issues posed by the growth of services at the expense of manufacturing, see Abraham (2005).

⁸ See also Dasgupta (2001).

⁹ See Hicks and Hicks (1939) for a summary of the early debate on what ought to be included in the national income (which, at the time, was considered a welfare concept rather than a production concept as in the SNA).

services for final household consumption notwithstanding the importance of these several issues, we restrict ourselves here to the SNA framework where GDP is taken as a measure of production, not welfare. We also ignore the issue of netting out ‘instrumental expenditures’ from output.

In this context, as noted, the standard practice is to equate the value of government outputs to its cost, notwithstanding the SNA 93 proposal to estimate government outputs directly. The value added that, say, public education contributes to GDP is based on the wage bill and other costs of providing education, such as outlays for utilities and school supplies.¹⁰ Similarly for public health, the wage bill of doctors, nurses and other medical staff and medical supplies measures largely comprises its value added. Thus, in the (pre-93) SNA used almost everywhere, non-market output, by definition, equals total costs. Yet the same costs support widely different levels of public output, depending on the quality of the public sector.

Note that value added is defined as payments to factors (labor and capital) and profits. Profits are assumed to be zero in the non-commercial public sector. As for the return to capital, in the current SNA used by most countries, public capital is attributed a *net* return of zero—i.e., the return from public capital is equated to its depreciation rate. This lack of a net return measure in the SNA is not due to a belief that the net return is actually zero, but to the difficulties of estimating the return.

Atkinson and others (2005, page 12) state some of the reasons behind current SNA practice: “Wide use of the convention that (output = input) reflects the difficulties in making alternative estimates. Simply stated, there are two major problems: (a) in the case of collective services such as defense or public administration, it is hard to identify the exact nature of the output, and (b) in the case of services supplied to individuals, such as health or education, it is hard to place a value on these services, as there is no market transaction.”

Murray (2010) also observes that studies of the government’s *production* activities, and their implications for the measurement of living standards, have long been ignored. He writes: “Looking back it is depressing that progress in understanding the production of public services has been so slow. In the market sector there is a long tradition of studying production functions, demand for inputs, average and marginal cost functions, elasticities of supply, productivity, and technical progress. The non-market sector has gone largely unnoticed. In part this can be explained by general difficulties in measuring the output of services, whether public or private. But in part it must be explained by a completely different perspective on public and private services. Resource use for the production of public services has not been regarded as inputs into a production process, but as an end in itself, in the form

¹⁰ Note that value added is defined as payments to factors (labor and capital) and profits. Profits are assumed to be zero in the non-commercial public sector. As for the return to capital, in the current SNA used by most countries, public capital is attributed a *net* return of zero—i.e., the return from public capital is equated to its depreciation rate. This lack of a net return measure in the SNA is not due to a belief that the net return is actually zero, but to the difficulties of estimating the return.

of public consumption. Consequently, *the production activity in the government sector has not been recognized.*" (Our italics.)

The simple point that we make in this paper is that once it is recognized that the effectiveness of the government's 'production function' varies significantly across countries, the simple convention of equating output value to input cost must be revisited. Thus, if we learn that the same output could be achieved with less inputs, it is more appropriate to credit GDP or GNI with the *required* inputs rather than with the *actual* inputs that include waste.¹¹ While perceptions of government effectiveness vary widely among countries as, e.g., the World Bank's Governance indicators attests (Kaufmann and others 2009), getting reliable measures of government actual effectiveness is a challenging task as we shall discuss below.

In physics, *efficiency* is defined as the ratio of useful work done to total energy expended, and the same general idea is associated with the term when discussing production. Economists simply replace 'useful work' by 'outputs' and 'energy' by 'inputs.' Technical efficiency means the adequate use of the available resources in order to obtain the maximum product. Why focus on technical efficiency and not other concepts of efficiency, such as price or allocative efficiency? Do we have enough evidence on public sector inefficiency to make the appropriate corrections?

The reason why we focus on technical efficiency in this preliminary inquiry is twofold. First, it corresponds to the concept of waste. Productive inefficiency implies that some inputs are wasted as more could have been produced with available inputs.¹² In the case of allocative inefficiency, there could be a different allocation of resources that would make everyone better off but we cannot say that necessarily some resources are unused—although they are certainly not aligned with social preferences. Second, measuring technical inefficiency is easier and less controversial than measuring allocative inefficiency. To measure technical inefficiency, there are parametric and non-parametric methods allowing for construction of a best practice frontier. Inefficiency is then measured by the distance between this frontier and the actual input-output combination being assessed.¹³

Indicators (or rather ranges of indicators) of inefficiency exist for the overall public sector and for specific activities such as education, healthcare, transportation, and other sectors. However, they are far from being uncontroversial. Sources of controversy include: omission of inputs and/or outputs, temporal lags needed to observe variations in the output indicators, choice of measures of outputs, and mixing outputs with outcomes. For example, many social

¹¹ Among others, Pritchett (2000), and Keefer and Knack (2007) have called attention to the quality of public investment where spending often may not translate into genuine asset-building. See also Tanzi and Davoodi (1997) and Gupta and others (2011).

¹² A related concept is "productive public spending" (see IMF, 1995), however this deals with the contribution of spending to capital formation, accumulation and its depreciation.

¹³ While technical efficiency focuses on 'doing things right,' allocative efficiency focuses on the harder question of 'doing the right things.'

and macroeconomic indicators impact health status beyond government spending (Spinks and Hollingsworth, 2009, and Joumard and others, 2010) and they should be taken into account. Most of the output indicators available show autocorrelation and changes in inputs typically take time to materialize into outputs' variations. Also, there is a trend towards using outcome rather than output indicators for measuring the performance of the public sector. In health and education, efficiency studies have moved away from outputs (e.g., number of pre-natal interventions) to outcomes (e.g., infant mortality rates). When cross-country analyses are involved, however, it must be acknowledged that differences in outcomes are explained not only by differences in public sector outputs but also differences in other environmental factors outside the public sector (e.g., culture, nutrition habits).

Empirical efficiency measurement methods first construct a reference technology based on observed input-output combinations, using econometric or linear programming methods. Next, they assess the distance of actual input-output combinations from the best-practice frontier. These distances, properly scaled, are called *efficiency measures* or scores. An input-based efficiency measure informs us on the extent it is possible to reduce the amount of the inputs without reducing the level of output. Thus, an efficiency score, say, of 0.8 means that using best practices observed elsewhere, 80 percent of the inputs would suffice to produce the same output.

We base our corrections to GDP on the efficiency scores estimated in two papers: Afonso and others (2010) for several indicators referred to a set of 24 countries, and Evans and others (2000) focusing on health, for 191 countries based on WHO data. These studies employ techniques similar to those used in other studies, such as Gupta and Verhoeven (2001), Clements (2002), Carcillo and others (2007), and Joumard and others (2010).

- Afonso and others (2010) compute public sector performance and efficiency indicators (as performance weighted by the relevant expenditure needed to achieve it) for 24 EU and emerging economies. Using DEA, they conclude that on average countries could use 45 percent less resources to attain the same outcomes, and deliver an additional third of the fully efficient output if they were on the efficiency frontier. The study included an analysis of the efficiency of education and health spending that we use here.
- Evans and others (2000) estimate health efficiency scores for the 1993–1997 period for 191 countries, based on WHO data, using stochastic frontier methods. Two health outcomes measures are identified: the disability adjusted life expectancy (DALE) and a composite index of DALE, dispersion of child survival rate, responsiveness of the health care system, inequities in responsiveness, and fairness of financial contribution. The input measures are health expenditure and years of schooling with the addition of country fixed effects. Because of its large country coverage, this study is useful for illustrating the impact of the type of correction that we are discussing here.

We must note that ideally, we would like to base our corrections on input-based technical-efficiency studies that deal exclusively with inputs and outputs, and do not bring outcomes into the analysis. The reason is that public sector outputs interact with other factors to produce outcomes, and here cross-country heterogeneity can play an important role driving cross-country differences in outcomes. Unfortunately, we have found no technical-efficiency studies covering a broad sample of countries that restrict themselves to input-output analysis. In particular, these two studies deal with a mix of outputs and outcomes. The results reported here should thus be seen as illustrative. Furthermore, it should be underscored that the level of “waste” that is identified for each particular country varies significantly across studies, which implies that any associated measures of GDP adjusting for this waste will also differ.

III. CORRECTED GDP

Let y_i be country i 's per capita GDP (or GNI):

$$y_i = g_i + x_i$$

Where g_i is the government's value added (i.e., its contribution to national income), and x_i is the contribution of the non-government sector. If country i had an overall efficiency score of ε_i for the public sector, then the corrected per-capita GDP is given by

$$\tilde{y}_i = \varepsilon_i g_i + x_i$$

Arguably, \tilde{y}_i is a better measure of living standards, as it removes the waste, $(1 - \varepsilon)g_i$, from y_i —and, consequently, from household consumption. Note that this correction is not needed for the private x_i as its value is assessed directly by the consumers in their market transactions.

This correction may be carried out in a more disaggregated way when efficiency scores for different government functions are available. For illustrative purposes, we shall first use the efficiency scores estimated in Afonso and others (2010), rescaled to lie in $[0,1]$. In their paper, they estimate public sector efficiency indicators for different categories—i.e., administration, human capital, health, distribution, stability, and economic performance. We focus here on the ones corresponding to the functional categories of health and education.

Let ε_i^h and ε_i^e be the corresponding (rescaled) efficiency scores, and let H_i and E_i be country i 's public expenditure in health and education (h_i and e_i as percentages of GDP). If the fraction $\omega_i^h = (1 - \varepsilon_i^h)$ of resources is wasted, then

$$\tilde{H}_i = (\text{Health Expenditures} - \text{Waste}) = (1 - \omega_i^h)H_i$$

is the corrected estimate of the contribution of public health services to GDP. Similarly, with

education we have public waste equal to $\omega_i^e E_i$, and effective expenditures of $\tilde{E}_i = (1 - \omega_i^e)E_i$. Next we purge $\omega_i^h H_i$, and $\omega_i^e E_i$, from GDP using the average (1998–2002) functional shares reported in Table 1 of Afonso and others (2010).¹⁴

Table 1 shows the percentage-of-GDP losses due to public waste in education and health—i.e., $\omega^e e_i$ and $\omega^h h_i$. Overall, the size of the correction is quite remarkable; the average loss amounts to 4.1 percentage points of GDP, while averages for education and health are 1.5 and 2.6. Given an average spending of 4.6 percent of GDP on education and 4.0 percent of GDP on health, this means that 32.6 and 65.0 percent of the inputs are wasted in the respective sectors. Note that the best-practice frontier that is used as reference to compute the efficiency scores is constructed on the basis of this set of 24 countries. Increasing the reference group to a larger set of countries can only make these efficiency scores worse, as the reference technology becomes richer.

¹⁴ Note that the percent correction is a linear operation and, thus, can be applied either to components and ratios. If, e.g., we are considering per-capita GDP, then $\hat{y}_i = \tilde{Y}_i/N_i = \varepsilon_i Y_i/N_i = \varepsilon_i y_i$.

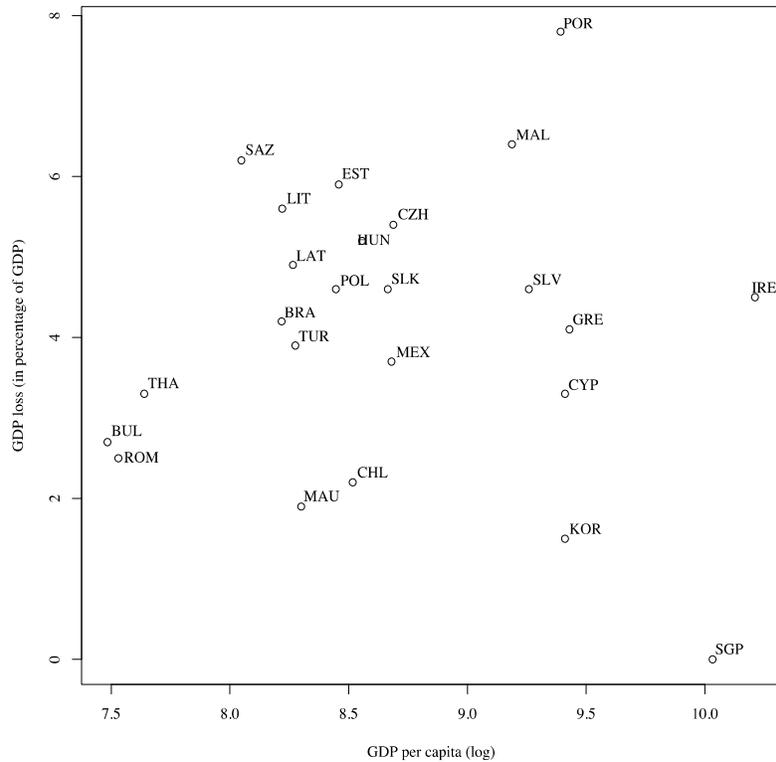
Table 1. GDP Losses Associated with Wasted Public Resources

(Percentages of GDP, averages 1998–2002)

Country	Education	Health	Sum
Brazil	2.2	2.0	4.2
Bulgaria	0.1	2.6	2.7
Chile	1.2	1.0	2.2
Cyprus	2.2	1.1	3.3
Czech Republic	0.6	4.8	5.4
Estonia	2.8	3.0	5.9
Greece	0.5	3.6	4.1
Hungary	1.3	3.9	5.2
Ireland	1.0	3.5	4.5
Korea, Rep.	0.5	1.0	1.5
Latvia	2.8	2.1	4.9
Lithuania	2.5	3.1	5.6
Malta	1.7	4.7	6.4
Mauritius	1.2	0.7	1.9
Mexico	2.4	1.2	3.7
Poland	1.8	2.8	4.6
Portugal	3.1	4.8	7.8
Romania	0.0	2.5	2.5
Singapore	0.0	0.0	0.0
Slovak Republic	0.8	3.8	4.6
Slovenia	0.0	4.6	4.6
South Africa	3.7	2.5	6.2
Thailand	2.3	1.0	3.3
Turkey	1.2	2.6	3.9
Average	1.5	2.6	4.1

Source: Authors' calculations based on efficiency scores in Afonso and others (2010).

Figure 1 plots the GDP losses against the corresponding per capita GDPs. For this set of countries, there is no strong discernible pattern, as the points scatter rather uniformly over the plot area. Perhaps it could be argued that the range of correction sizes increases with the level of income—the lower envelope of the scatter slopes negatively while the upper envelope slopes positively.

Figure 1. GDP Loss Due to Health and Education Waste vs. Per Capita GDP

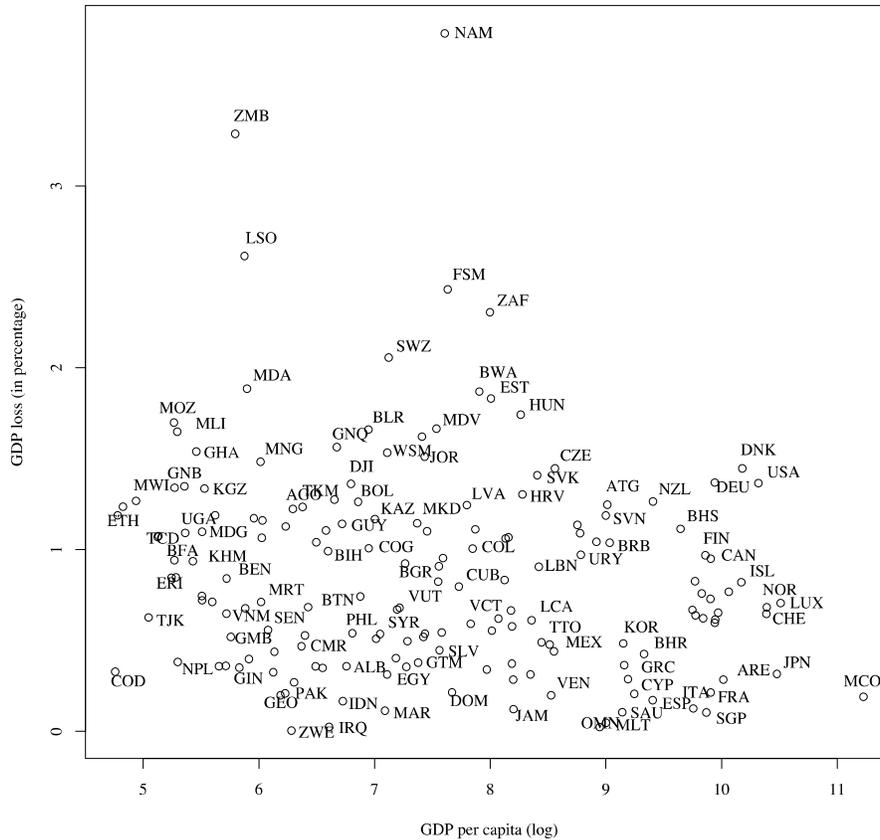
Source: Authors' calculations based on efficiency scores in Afonso and others (2010).

Another matter of interest is whether the per-capita-GDP ranking is altered at all due to the correction (i.e., whether any country changes relative position). This re-ordering happens in 9 occasions out of the 24 countries. In the scatter plot (Figure 1), the candidates are pairs of countries where one is almost vertically on top of each other, but slightly to the right, and where the vertical (correction) distance is substantial. For example, Korea overtakes Cyprus; Cyprus, in turn, almost catches up with Greece, Brazil overtakes Lithuania, and Poland overtakes Estonia.

We turn now to the WHO study by Evans and others (2000) covering health in both advanced and developing economies. The average GDP loss is 0.9 percentage points (the median is 0.8 percent of GDP). This is lower than the estimate in Table 1 for health, reflecting the lower level of health spending in the wider country dataset used in the WHO study. The losses are uniformly distributed over the per-capita-GDP range. Baldacci and others (2008) find that in countries suffering from poor governance, the positive effects of increased spending on education is reduced, and those of higher health spending can be completely negated. Rajkumar and Swaroop (2008) also show that, in a context of low quality of governance, increased expenditures in health and education are not reflected in

improved social outcomes. Given the high correlation between income and governance, poorer countries tend to have more ineffective governments. At the same time, they tend to spend less on health. The combined effect is a broadly uniform distribution of waste, as Figure 2 shows.

Figure 2. GDP Loss Due to Health Waste vs. Per Capita GDP

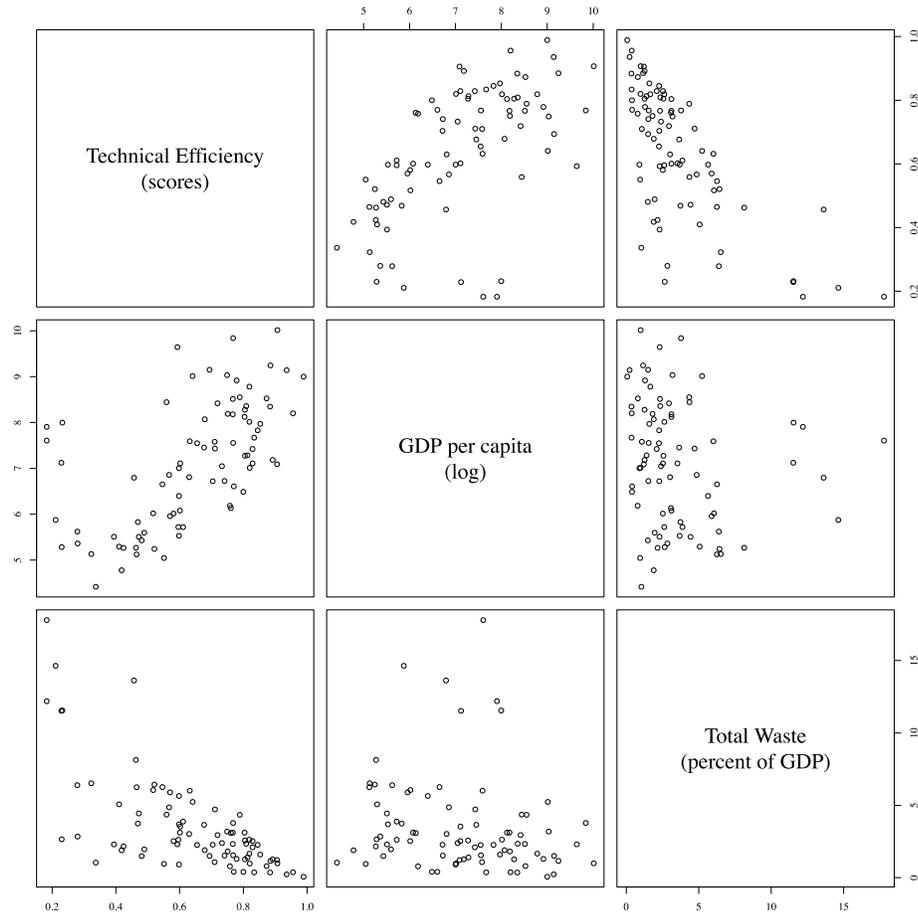


Source: Authors' calculations based on efficiency scores in Evans and others (2000).

While we recognize that inefficiency scores are sector-specific, we perform a “virtual experiment” by asking what would be the implications if these inefficiencies applied, on average, throughout all public-sector activities. What would be the extent of the ‘missing’ GDP? Figure 3 shows the distribution of the correction vs. per capita GDP and technical efficiency scores. Technical efficiency is positively correlated with per capita GDP. As before, the correction is roughly uniformly distributed across the range of per capita GDP. The effects of lower efficiency scores and lower spending broadly compensate for each other. Thus, poorer countries with more ineffective government also spend a smaller share of GDP in public services, so any correction of the sort discussed here is going to be small. The

scatter of technical efficiency vs. total waste displays an upper envelope: the estimated waste is bounded by the efficiency score.

Figure 3. Technical Efficiency Scores, per Capita GDP, and Total Loss



Source: Authors' calculations based on efficiency scores in Evans and others (2000).

Finally, we turn our attention to the country rankings of living standards, the GNI per capita computed using the World Bank's Atlas methodology.¹⁵ As noted, this is the measure that the World Bank uses for classifying countries in income groups, as well as to set lending eligibilities. What is the effect on the ranking of the corrections that we are discussing here? Let us consider the correction based on the health efficiency scores of Evans and others

¹⁵ The Atlas method converts countries GNI in US dollars applying the Atlas conversion factor. This consists of a three-year average of exchange rates to smooth effects of transitory exchange rate fluctuations, adjusted for the difference between the rate of inflation in the country and that in a number of developed countries. For more details see <http://data.worldbank.org/indicator/NY.GNP.PCAP.CD>.

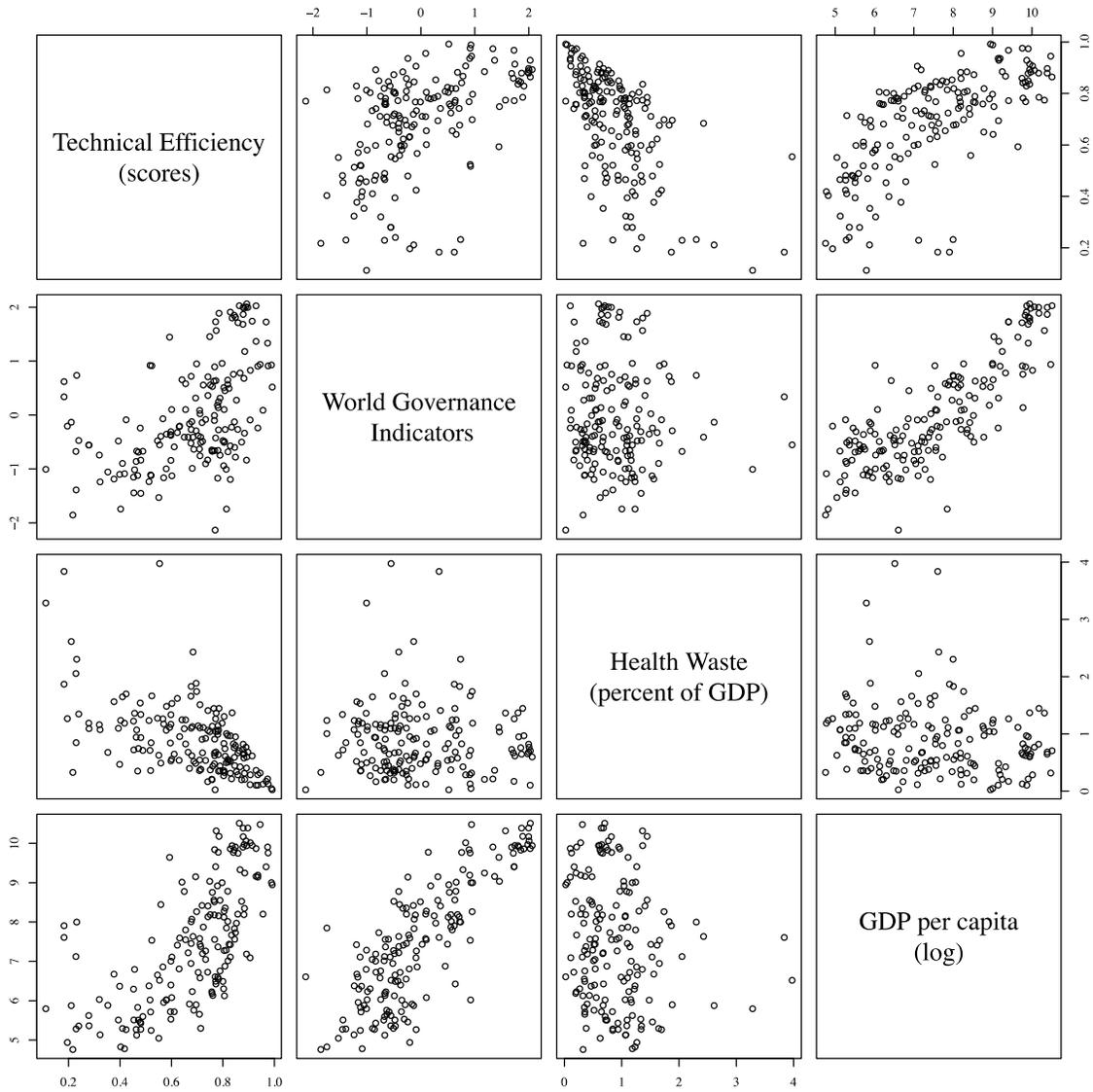
(2000) applied to the value added of public administration and defense for the 2009 GNI. The result is a re-ordered country ranking where 51 countries out of 93 change their relative positions. Since the value added variable is available only for non-developed countries, we perform the same correction on the wage bill—to cover a larger set of countries. The portion of reordered countries is still higher than 50 percent, as 59 of 116 countries are repositioned. In both corrections, about 70 percent of the reordering happens in the lower half of the original ranking and the average shift is approximately equal to two positions.

How does this relate to governance indicators? There are several governance indicators available, all of which are highly correlated. The broadest coverage set is probably the Worldwide Governance Indicators (WGI) by Kaufmann and others (2009). This database draws together information on perceptions of governance from a wide variety of sources, and organizes them into six clusters corresponding to the six broad dimensions of governance. These are voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. Other very important sources of governance indicators are Freedom House and Transparency International.

The indicator “Government Effectiveness” attempts to capture perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies.¹⁶ Figure 4 plots the ‘government effectiveness’ WGI against technical efficiency scores, GDP loss due to health waste, and per capita GDP. The WGI is positively correlated with GDP per capita, and, as a result, with the efficiency scores. Its relationship with estimated waste is less clear-cut. The biggest waste is associated with intermediate values of the government effectiveness indicator. Waste is biggest in inefficient countries that spend significant resources on health. Otherwise, waste is limited in inefficient countries that do not allocate significant resources to health spending.

¹⁶ See Kaufmann and others (2010) for details on methodology, data sources, and interpretation of the indicators.

Figure 4. Technical Efficiency Scores, WGI's Government Effectiveness, GDP Loss Due to Health Waste, and Per Capita GDP



Source: Authors' calculations based on efficiency scores in Evans and others (2000).

IV. CONCLUDING REMARKS

We have argued here that the current practice of estimating the value of the government's non-market output by its input costs is not only unsatisfactory but also misleading in cross-country comparisons of living standards. Since differences in the quality of the public sector have an impact on the population's effective consumption and welfare, they must be taken into account in comparisons of living standards. We have performed illustrative corrections of the input costs to account for productive inefficiency, thus purging from GDP the fraction of these inputs that is wasted.

Our results suggest that the magnitude of the correction could be significant. When correcting for inefficiencies in the health and education sectors, the average loss for a set of 24 EU member states and emerging economies amounts to 4.1 percentage points of GDP. Sector-specific averages for education and health are 1.5 and 2.6 percentage points of GDP, implying that 32.6 and 65.0 percent of the inputs are wasted in the respective sectors. These corrections are reflected in the GDP-per-capita ranking, which gets reshuffled in 9 cases out of 24. In a hypothetical scenario where the inefficiency of the health sector is assumed to be representative of the public sector as a whole, the rank reordering would affect about 50 percent of the 93 countries in the sample, with 70 percent of it happening in the lower half of the original ranking. These results, however, should be interpreted with caution, as the purpose of this paper is to call attention to the issue, rather than to provide fine-tuned waste estimates.

A natural way forward involves finding indicators for both output quantities and prices for direct measurement of some public outputs. This is recommended in SNA 93 but has yet to be implemented in most countries. Moreover, in recent times there has been an increased interest in outcomes-based performance monitoring and evaluation of government activities (see Stiglitz and others, 2010). As argued also in Atkinson (2005), it will be important to measure not only public sector outputs but also outcomes, as the latter are what ultimately affect welfare. A step in this direction is suggested by Abraham and Mackie (2006) for the US, with the creation of "satellite" accounts in specific areas as education and health. These extend the accounting of the nation's productive inputs and outputs, thereby taking into account specific aspects of non-market activities.

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