



# TECHNICAL

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# NOTES & MANUALS

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## **The Corruption Cost Tracker** An Online Tool to Assess Corruption Risks in Public Procurement

Olivier Basdevant and Mihály Fazekas



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# The Corruption Cost Tracker

## An Online Tool to Assess Corruption Risks in Public Procurement

Olivier Basdevant and Mihály Fazekas

Authorized for distribution by Nikolay Gueorguiev

**This technical note addresses the following issues:**

- Assessment of corruption risks in public procurement and their effect on relative prices.
- The note presents the Corruption Cost Tracker (<https://public.tableau.com/app/profile/gti1940/viz/CorruptionCostTracker/Overviewofcountries?publish=yes>), an online tool complementing the analysis presented in Abdou and others (2022).
- The Corruption Cost Tracker enables policymakers and stakeholders to address corruption risks in public procurement. It is an interactive online tool with dashboards for Corruption Risk Analysis, Spending Analysis, Efficiency Gains, and Policy Scenarios.

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# I. Introduction

The Corruption Cost Tracker (CCT) builds on large microeconomic data on public procurement contracts to develop aggregated and synthetic indicators of vulnerabilities to corruption and their cost.<sup>1</sup> These indicators are important particularly for policymakers and stakeholders because the synthetic information in the CCT can (1) enable them to identify corruption risks and the potential effects of these risks in terms of higher prices paid by national budgets and (2) serve as a guide for anticorruption reforms. Our work has caveats as we note in our companion paper (Abdou and others 2022): first, we focus on corruption risks and not actual instances of corruption; second, although we cover some of these risks (in how they affect relative prices), other factors exist (that may or may not be related to corruption) and are not covered by our indicators. The CCT contains six tabs, visualizing the results described in our companion paper (Abdou and others 2022).

- Country selector page
- Corruption risk mapping tab
- Procurement spending analysis dashboard
- Efficiency gains overview
- COVID-19-related goods
- Policy scenarios dashboard

Because our analysis relies on public contracts on a e-procurement portal, it may leave out contracts not entered in the system (for example, classified expenditure, that is, spending not to be disclosed to the general public).<sup>2</sup> Thus, spending analysis by public organization type (as well as by sectors) based on this tool may differ from the general spending picture (see also our companion paper, Abdou and others 2022).

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<sup>1</sup> The CCT was developed with the support of the Government Transparency Institute, the IMF, and the UK Foreign, Commonwealth and Development Office. The spending figures displayed in the CCT are based on country-level ratios between total procurement spending in the micro data and budget statistics and are multiplied by all micro-data-based spending and absolute savings aggregates (Bosio and others 2020). The validity of this extrapolation rests on the assumption that the price impact of corruption risks is comparable in the observed public procurement data to other public procurement spending which is not transparently advertised and published. This most likely leads to an underestimation of the total cost of corruption, as we can safely argue that untransparent contracts are more prone to corrupt overpricing than transparent contracts.

<sup>2</sup> The data requirements include having a publicly available online database disclosing all or nearly all public procurement contracts. Thus, the methodology cannot be used in countries that have yet to put in place an e-procurement system. Although e-procurement portals are widely used in advanced economies and emerging market economies, they are only sporadically used in low-income countries. Rolling out such systems for low-income countries could be particularly helpful in curbing vulnerabilities to corruption in procurement systems (Fazekas and Blum 2021).

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## II. Using the Corruption Cost Tracker

This section describes how to go from the landing page (country information) to the Corruption Risk Index (CRI) and its interpretation and then how the data can be used to inform spending analysis and losses to corruption.

### Landing Page: Country Information

On the landing page, the user is presented with an interactive map wherein the countries with data available are highlighted in green. Figure 1 shows the CCT country overview page for which 34 countries are currently available. When hovering over a country, a pop-up info box shows the number of contracts in our databases, as well as the estimated overall loss from corruption risk in international US dollars and as a percentage of total purchases.<sup>3</sup>

Figure 1. The 34 Countries in the Corruption Cost Tracker's Country Overview Page



Source: Government Transparency Institute, Corruption Cost Tracker.

Note: The boundaries, colors, denominations, and any other information shown on the maps do not imply, on the part of the International Monetary Fund, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

Although the landing page offers synthetic information on each country, the CCT is ultimately used to assess the effect of corruption risks on relative prices within a country, rather than to offer a cross-country benchmarking exercise. Because of idiosyncrasies in data collection, especially at the level of price differential, direct cross-country comparisons would not be informative. Our calculations differ slightly between countries, depending on whether relative prices are derived from relative contract price (whenever it is available) or unit prices of countries (see bullet points below).<sup>4</sup>

<sup>3</sup> The methodology used to estimate the loss is presented in greater details in the companion working paper (Abdou and others 2022).

<sup>4</sup> See the annex of the CCT Guide (<https://www.govtransparency.eu/wp-content/uploads/2023/01/Annex-Imf-CCT-guide.pdf>) for more details. Note that all prices are adjusted to international dollars using the World Bank purchasing-power-parity conversion factor (code: PA.NUS.PPP) available through the World Bank open data (<https://data.worldbank.org/indicator/PA.NUS.PPP>).

- Calculations based on relative contract prices. We first compute the ratio of each contract (for a given year) to the total public procurement spending on that year. We then use this ratio to extrapolate aggregated contract values presented in the CCT.
- Calculations based on unit price of contracts. We use this logic for extrapolation for Chile, Mexico, and Uruguay. Since unit price calculations are only relevant for goods, we slightly modify this calculation. We first compute two ratios: (1) the share of goods under consideration based on a standardized classification in all the procured goods within each year and (2) the share of goods under consideration within each sector. We then multiply the total observed procurement spending by both ratios to obtain the ratio used for extrapolation.<sup>5</sup>

## Corruption Risk Index

Clicking on a country at the starting map takes the user to the corruption risk analysis page (CRI analysis). At this page, the CCT allows for the comparison of corruption risk levels within each country by sector, region, year, and public organization type (for example, municipal administrations). Cross-country CRI comparisons should be subject to great caution because such comparisons would not necessarily reflect idiosyncrasies in the development of each indicator (because, for example, procurement procedures, government level, and sectoral coverage differ across countries). The CRI is an aggregate of the frequency of observation of seven red flags for corruption (Abdou and others 2022) across all procurement contracts available:

- single bidder contracts
- nonopen procedures
- lack of publication of call for tenders
- period for submitting bids. Periods for submission and decision are assessed as a red flag when they are among the longest or shortest (although it is an indication of potential corruption risk, it can also be due to idiosyncratic factors, which, as a result, imply taking results more as an indication of corruption risks rather than as firm assessments of corruption instances)
- period for decision making
- concentration of public procurement on some specific bidders
- share of suppliers registered in jurisdictions offering limited company and banking transparency

If all of these red flags were systematically observed across all procurement contracts, the CRI would take a value of 1 (0 is the lowest risk and 1 the highest risk). Figure 2 shows the mean CRI in Georgia by main sectors.<sup>6</sup> The highest risk sectors are real estate, public utilities, and public administration and defense. On the other end of the spectrum, medical equipment and pharmaceuticals is one of the lowest-risk sectors.

The CCT relies on public procurement micro data. This fact makes it responsive to changing regulatory frameworks. The CCT can also visualize the CRI trend in the country over time. Figure 3 shows a decreasing CRI trend in Georgia over 2010–19. Such visualizations can help policymakers to assess the overall health of the country's public procurement system after implementing different policies.

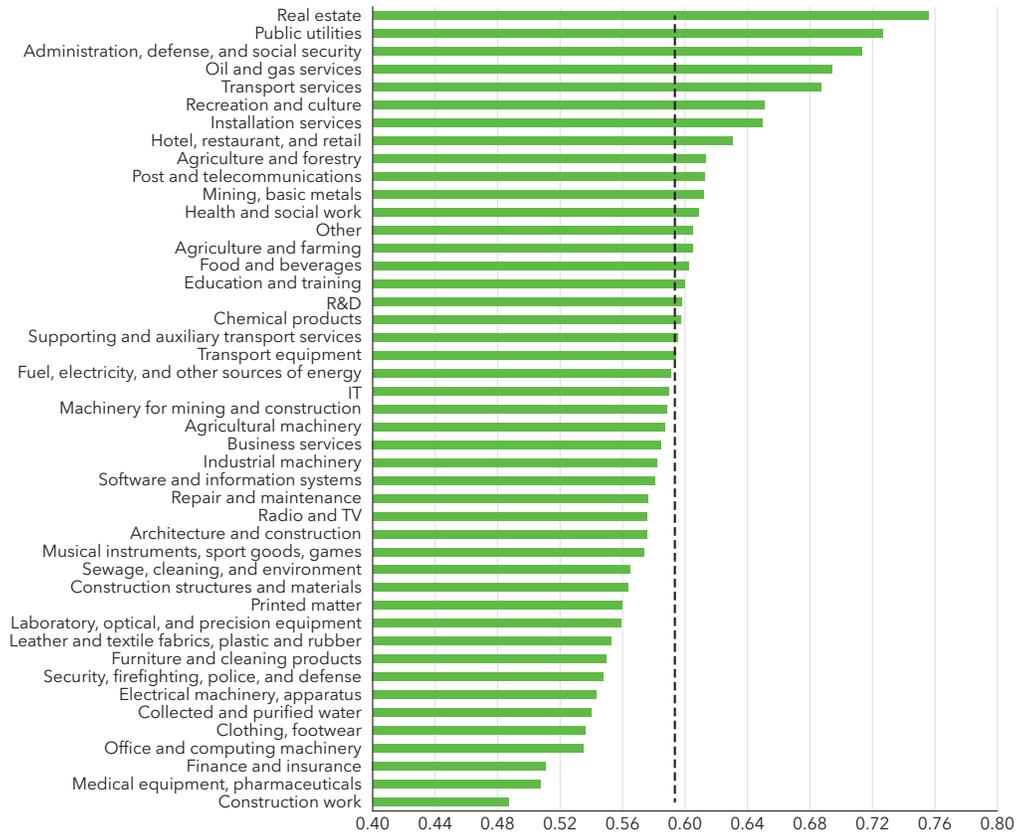
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<sup>5</sup> We use the Common Procurement Vocabulary (CPV). This classification, notably used by the European Union, endeavors to cover all requirements for supplies, work, and services. By standardizing the references used by contracting authorities to describe the subject matter of their contracts, the CPV improves the transparency of public procurement. The unit price countries do not publish CPV product codes. We created their own product correspondence tables to translate each of the national codes to their CPV correspondence where relevant. For this reason, each CPV division might contain a mix of both service products and goods because of differences in product classification frameworks.

<sup>6</sup> Throughout this technical manual, we use Georgia as an example, as it was among the five pilot countries covered by the study (Abdou and others 2022) with a comparatively high-quality and wide-scope public procurement data set. We chose Georgia in this manual solely for illustrative purposes to demonstrate how the CCT works.

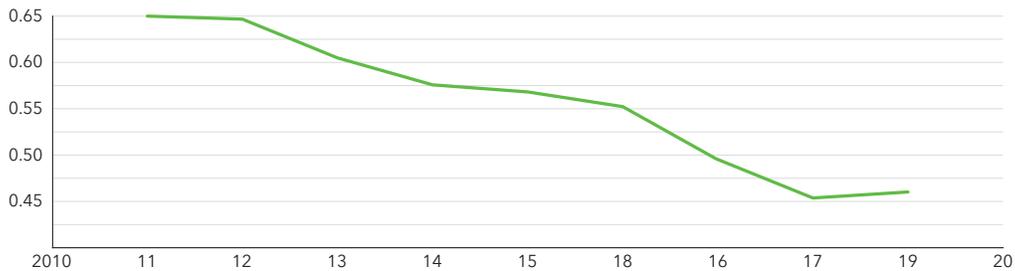
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**Figure 2. Georgia: Average Corruption Risk Index by Sector (Unit)**



Sources: Georgian authorities; and Government Transparency Institution, Corruption Cost Tracker.  
 Note: IT = information technology; R&D = research and development.

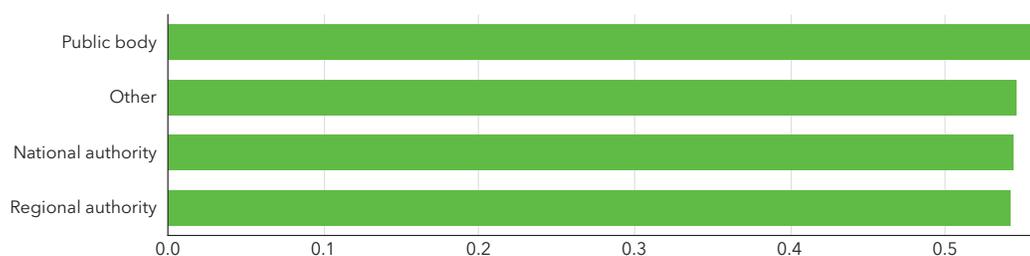
**Figure 3. Average Corruption Risk Index in Georgia, by Year, 2010-19**



Sources: Georgian authorities; and Government Transparency Institute, Corruption Cost Tracker.

Figure 4 compares average CRI levels in Georgia by types of public organizations. It shows that public bodies have a slightly higher CRI compared to other types of public organizations. Such visualizations can help policymakers identify the organization types in the public sector that are of higher risk.

Different regions within a country may have different risk levels depending on a range of factors such as the level of development, their administrative capacity, and the strength of their civil society. The CCT also helps to visualize the CRI scores in different regions to allow for regional comparisons.

**Figure 4. Average Corruption Risk Index in Georgia, by Public Organization Type, 2010-19**

Sources: Georgian authorities; and Government Transparency Institute, Corruption Cost Tracker.

**Figure 5. Average Corruption Risk Index in Georgia, by Region, 2010-19<sup>1</sup>**

Sources: Georgian authorities; and Government Transparency Institute, Corruption Cost Tracker.

Note: A darker color indicates a higher CRI and thus higher corruption risks. The boundaries, colors, denominations, and any other information shown on the maps do not imply, on the part of the International Monetary Fund, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

### Spending Analysis Based on the CRI

In the spending analysis dashboard, users can first view the spending by sectors. In Georgia, Figure 6 shows sectors ordered according to size of spending, revealing that construction work and repair and maintenance are the sectors with the largest spending, whereas real estate and administrative and social security have the lowest spending.

The CCT also visualizes the spending trend over time. Figure 7 shows an upward trend in public purchases in Georgia during 2010-19. The CCT also shows a breakdown of spending by public organization types. Figure 8 shows that spending by regional authorities in Georgia is higher than spending in public bodies and national authorities.

Policymakers can also use the CCT to track public spending across different regions. Figure 9 shows that the majority of spending is concentrated in the capital region of Tbilisi during 2010-19.

### Losses to Corruption Risks, Potential Gains from Anticorruption Policies

On the losses to corruption risks tab, the CCT shows comparisons of potential efficiency gains to be made from reducing corruption risks by sector, region, year, and public organization type. These efficiency gains are primarily assessed by regressing price differentials in public procurement spending (defined as the

**Figure 6. Spending in Georgia by Sectors**  
(USD billions, log scale)



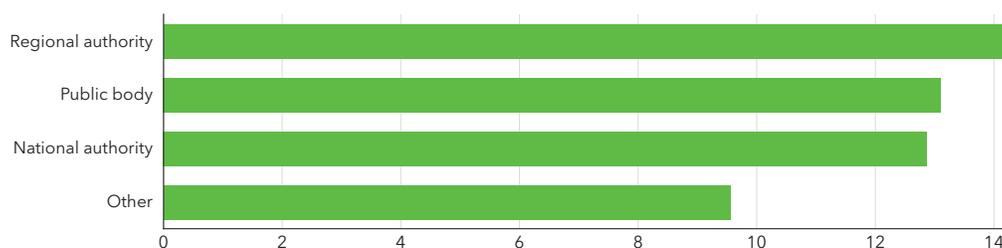
Sources: Georgian authorities; and Government Transparency Institution, Corruption Cost Tracker.  
Note: IT = information technology; R&D = research and development.

**Figure 7. Total Public Procurement Spending in Georgia, 2010-19**



Sources: Georgian authorities; and Government Transparency Institute, Corruption Cost Tracker.

difference between the actual price and a reference price, see Abdou and others 2022) on the CRI. Given the differences in methodologies in assessing price differentials, we caution against using the assessment of corruption losses that are derived for cross-country comparisons. Instead, these losses should be used within a country to inform, in a granular way, where to take actions to reduce vulnerabilities to corruption (for further details, see Abdou and others 2022). These figures aim to inform policy dialogue in deciding which areas to focus on to maximize gains from anticorruption efforts. The underlying estimates are based on our price modeling, which offers predictions of public procurement contract values according to corruption risk levels. Figure 10 illustrates how to rank sectors in a country by the percentage of potential efficiency

**Figure 8. Total Spending in Georgia, by Public Organization Type, 2010-19**

Sources: Georgian authorities; and Government Transparency Institute, Corruption Cost Tracker.

**Figure 9. Total Spending in Georgia, by Region, 2010-19**

Sources: Georgian authorities; and Government Transparency Institute, Corruption Cost Tracker.

Note: The boundaries, colors, denominations, and any other information shown on the maps do not imply, on the part of the International Monetary Fund, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

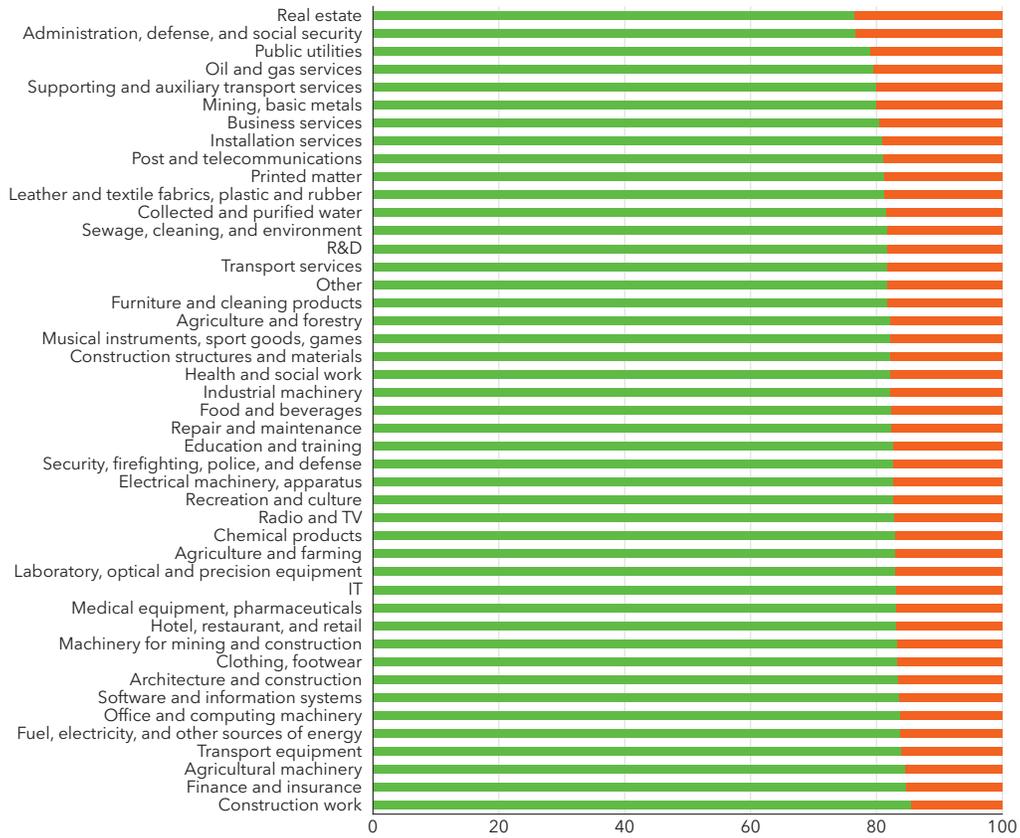
gains. According to this model, some of the largest savings can be achieved in, for example, public utilities or transport services.

Efficiency gains can also be visualized over time and by public organization type. Figure 11, panel 1, shows the efficiency gains to be made from eliminating corrupt practices over time in Georgia. This trend is most likely owing to the decreasing CRI trend over the same period (Figure 3). In Figure 11, panel 2, the CCT also shows efficiency gains to be made by type of public organization. When faced with limited resources, this type of breakdown can help policymakers focus their efforts on tackling corruption in the organization types that would generate the highest savings.

The efficiency gains statistics can also be explored on the regional level. The map in Figure 12 shows that in Georgia during 2010-19, the highest gains can be made in the Samegrelo-Zemo Svaneti, Abkhazia, and Imereti regions, for example. This deeper insight into the geographical distribution of corruption risk impacts can help policymakers locate the regions where corruption is most pressing.

Over the past two years, the COVID-19 pandemic has created shortages in medical supplies in many countries. To accommodate the sudden increase in demand, many countries have either modified their existing regulatory framework or have introduced new regulations (Arrowsmith and others 2021). Changes to regulations and sudden market pressures often lead to enhanced corruption risks in public procurement (Fazekas, Nishchal, and Søreide 2021). The CCT allows policymakers to track COVID-19-related spending as

**Figure 10. Average Efficiency Gains of Eliminating Corruption in Spending in Georgia, by Sector**  
(Spending, percent)

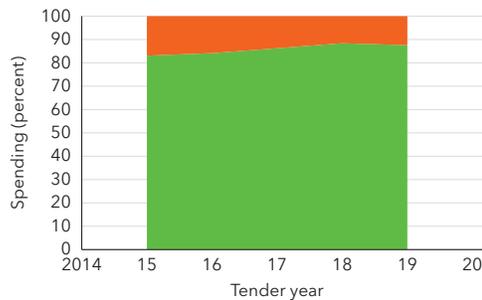


Sources: Georgian authorities; and Government Transparency Institution, Corruption Cost Tracker.  
Note: IT = information technology; R&D = research and development.

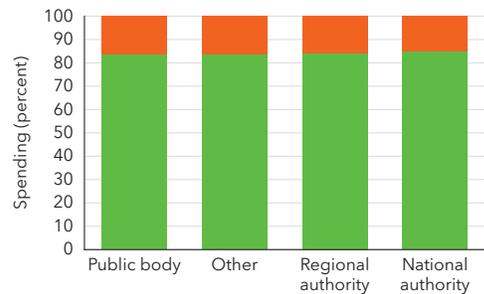
**Figure 11. Average Efficiency Gains of Eliminating Corruption in Sectoral Spending in Georgia, 2014-20**  
(Estimated percent decrease in the total value of sectoral spending)

(Estimated percent decrease in the total value of sectoral spending)

1. Estimated Efficiency Gains, by Year

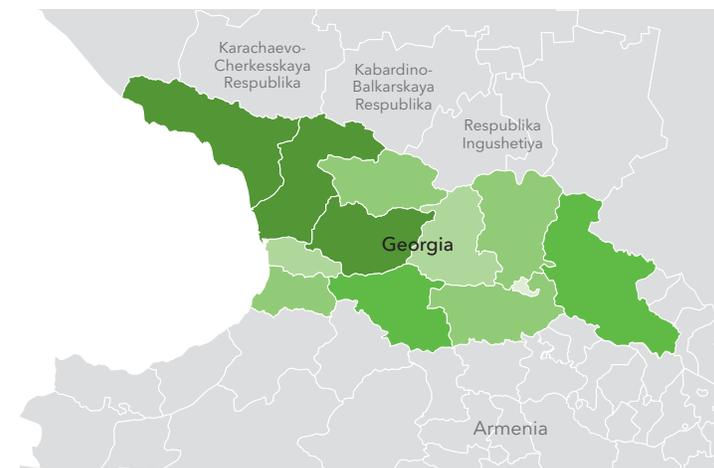


2. Estimated Efficiency Gains, by Buyer Type



Sources: Georgian authorities; and Government Transparency Institute, Corruption Cost Tracker.

**Figure 12. Average Efficiency Gain of Eliminating Corruption in COVID-19-Related Spending in Georgia, by Region**



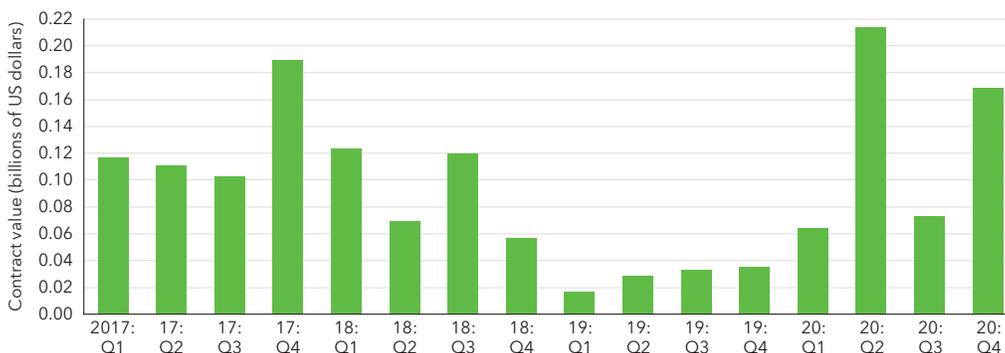
Sources: Georgian authorities; and Government Transparency Institute, Corruption Cost Tracker.  
 Note: The efficiency gain is computed by the decline in the total value of sectoral spending, expressed in percent. These gains are visualized through different shades: a darker color indicates a higher efficiency gain (that is, addressing a higher level of corruption risk). The boundaries, colors, denominations, and any other information shown on the maps do not imply, on the part of the International Monetary Fund, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

well as corruption risks in specific product groups. Such visualizations can help better assess and manage the effects of emergencies on the health of the country’s public procurement system.

We identified a list of COVID-19-related goods (such as FFP2 masks and medical breathing devices) based on the relevant regulatory guidelines of the European Commission and identified each relevant contract using product classifications as well as keywords. Figure 13 shows the total spending in Romania on COVID-19-related goods. In Romania, purchases of such equipment and supplies increased at the beginning of the pandemic, whereas spending on such products was considerable throughout 2017-18.

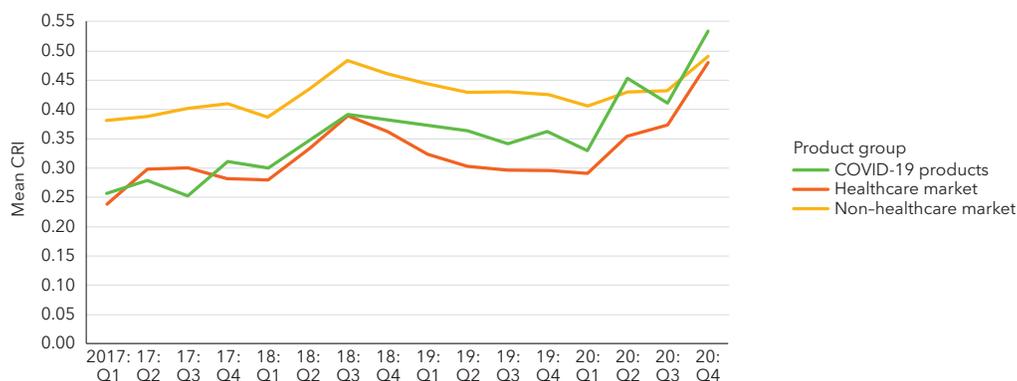
Figure 14 shows the types of products divided into three groups: non-healthcare products, healthcare products, and COVID-19-related products. This shows how the corruption risk score varies across the different product groups during the pandemic. In Romania, COVID-19-related products had low scores before the pandemic, but these increased relative to other product groups during the crisis. In addition, this analysis can help to identify any spillover effects from the pandemic to unrelated product groups, revealing

**Figure 13. Quarterly Spending in Romania on Products Related to the COVID-19 Pandemic, 2017-20**



Sources: Government Transparency Institute, Corruption Cost Tracker; and Romanian authorities.  
 Note: COVID-19 = coronavirus disease 2019.

**Figure 14. Quarterly CRI Trend in Romania, by Product Group, 2017-20**

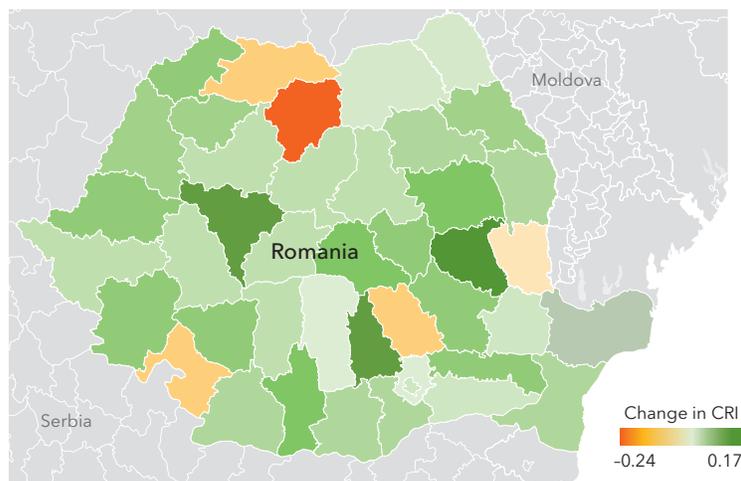


Sources: Government Transparency Institute, Corruption Cost Tracker; and Romanian authorities.  
 Note: COVID-19 = coronavirus disease 2019; CRI = Corruption Risk Index.

how introducing specific regulations to deal with suddenly increased demand may disrupt the whole public procurement market.

Figure 15 presents the geographical distribution of changing corruption risk scores during the COVID-19 pandemic.<sup>7</sup> Such visuals can identify the extent of the effect of the pandemic on Romanian counties. For example, Maramureş County and Bistriţa-Năsăud County decreased the CRI scores compared with neighboring Satu Mare County and Sălaj County in the Nord-Vest region. Policymakers can use such observations to further their understanding of the purchase structure in these counties and generate insights on dealing with similar disruptions in the future.

**Figure 15. Geographic Distribution of Changes in Corruption Risk in Romania**



Sources: Government Transparency Institute, Corruption Cost Tracker; and Romanian authorities.  
 Note: The boundaries, colors, denominations, and any other information shown on the maps do not imply, on the part of the International Monetary Fund, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries. CRI = Corruption Risk Index.

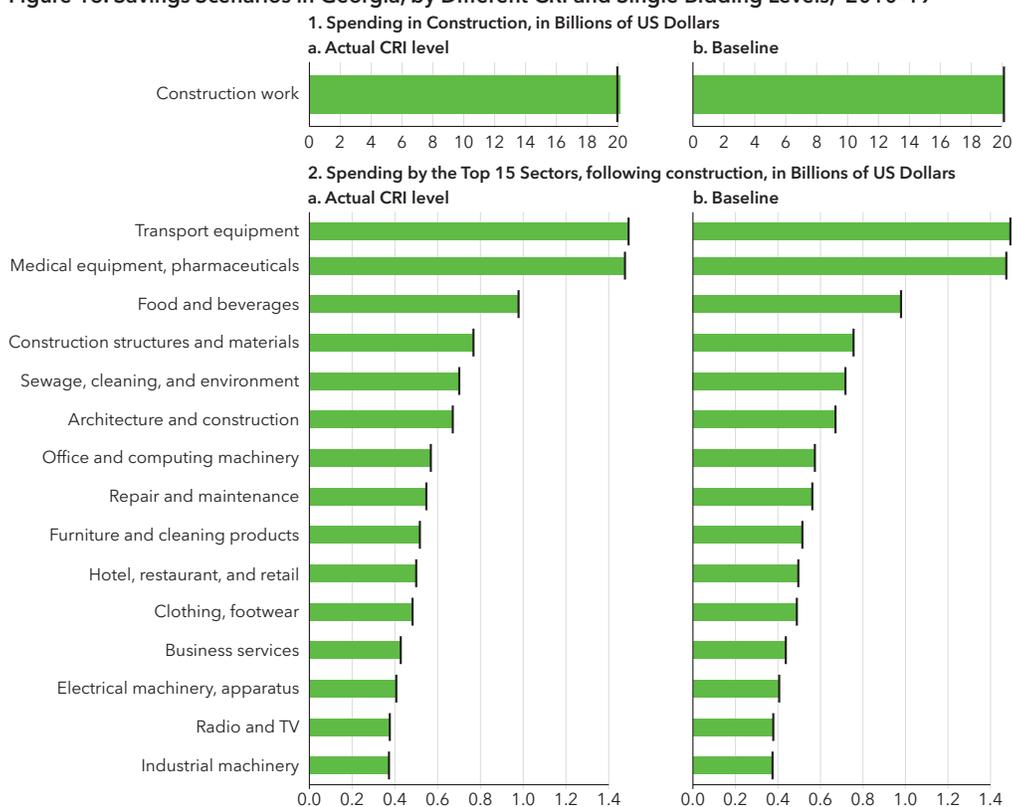
<sup>7</sup> We assume that the COVID-19 pandemic began in February 2020 and is ongoing.

### III. Informing Governance Reforms in Public Procurement

In the Scenarios tab, the spending implications of different corruption risk levels can be further probed through various policy scenarios reflecting varying levels and types of corruption risks and the associated public procurement spending. Based on the results of overpricing models, we can predict how sectoral procurement spending would vary if the level of CRI were changed or the prevalence of a single risk factor were altered.<sup>8</sup> Then, depending on which components are more prevalent in the CRI score, policies can be designed to reduce corruption risk factors in these components.

Figure 16 shows how to use the tool to evaluate different reforms. Here, we show estimates for the sectoral spending effect of reducing the composite CRI by one-third, two-thirds, and so forth, or reducing single bidding by one-third, for example. Users can compare the financial benefits of reducing the incidence of single bidding—which is the strongest predictor of prices in Georgia.<sup>9</sup> Furthermore, users can add to the dashboard actionable risk factors and their price impacts, such as online advertisement of tenders, choice of procedure type, or the award of contracts to companies registered in tax havens. Such scenarios could inform policy decisions on how best to reduce budget deficits without compromising public service quality.

**Figure 16. Savings Scenarios in Georgia, by Different CRI and Single Bidding Levels, 2010-19**



Sources: Georgian authorities; and Government Transparency Institute, Corruption Cost Tracker.  
 Note: CRI = Corruption Risk Index.

<sup>8</sup> The predictions are based on regressions of relative prices on CRI and are further described in Abdou and others (2022).

<sup>9</sup> Our regressions do not control for at least a handful of potential competitors (for example, in Georgia, only 30 contracts are awarded on markets where fewer than three suppliers have won contracts over the years, a negligible amount compared to the 200,000 contracts in the sample). Hence, the lack of bidders (single bidding) can be considered a sign that competition was limited mostly because of corruption.

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