Red flags in public procurement

A guide to using data to detect and mitigate risks

OPEN CONTRACTING PARTNERSHIP

Introduction

This guide builds on the Open Contracting Partnership's (OCP) previous work to help our global partners publish and use open contracting data to achieve greater public integrity. In 2016, we launched our Red Flags for Integrity Guide, a methodology to calculate a list of risk indicators that identify corruption risks throughout the procurement process from planning to implementation, mapped to the Open Contracting Data Standard (OCDS). Our partners have used this guidance to build red flags analytical tools and dashboards and implement civic monitoring initiatives.

This document refines our guidance on how to use public procurement data to calculate red flags indicators. It covers:

1. Our definition of red flags and OCP's approach to supporting partners to calculate procurement risks.

2. What data is most useful to calculate red flags.

3. A step-by-step guide on how to implement red flags in practice.

4. A revisited list of red flags indicators in public procurement, drawn from academic literature, international best practice and existing red flags implementations. The list includes definitions, detailed formulas to calculate red flags using standardized data and examples.

What are red flags?

One in every three government dollars is spent on public procurement, around US$13 trillion annually or 12% of global GDP (Spend Network & Open Contracting Partnership, 2020, Bosio et al., 2020). Although procurement is critical for delivering public services and an important influence on a country's broader socioeconomic environment (World Bank, 2021), public procurement systems are also fraught with waste, abuse, and inefficiency, and are one of a government's most vulnerable activities to corruption (OECD, 2016, Fazekas, Skuhrovec, & Wachs, 2018; Auriol, Straub, & Flochel, 2016; Lagunes, 2017).

While corruption in public procurement is a multifaceted phenomenon that can be challenging to quantify (Gnaldi & De Salto, 2023), the increased availability of public procurement data globally (Global Data Barometer, OCP data registry) represents an opportunity to reinforce integrity and fairness practices, by using data analytics to potentially detect and deter corruption and fraud before contracts are awarded.

One way of detecting procurement risks using data is by calculating red flags indicators or corruption proxies.

Red flags can be defined as indicators that can help spot potential risks of irregularities, corruption and wrongdoing along the entire chain of a contracting process. While these indicators do not necessarily demonstrate the presence of corruption, they can be considered good measures to signal corruption risks and can be correlated with corrupt practices.

Calculating red flags indicators can contribute to:

1. **More efficient risk detection.** Using data to automatically detect risks in public procurement can increase the efficiency of monitoring tasks. It can change the approach of manually or randomly selecting procedures to investigate, to data-driven selection of processes for review, that can help monitoring officials or users to be more efficient and concentrate their monitoring efforts on relevant procedures.

2. **Increasing integrity.** Adopting proactive, pro-integrity flagging and detection methods allows us to track and deter illicit behavior at its source and identify and promote positive practices. It also supports developing innovative tools and technologies to help deliver better system-wide outcomes and shift thinking from simply compliance with paperwork to managing systemic performance.

3. **Improving the procurement process and practices.** By detecting suspicious behavior, we may be able to identify overall weaknesses in the procurement ecosystem and recommend policy or technical changes to improve practices. In this way, flagging is a proactive, and not just a reactive, tool. Improving integrity also directly promotes the other main use cases for open contracting: greater value for money, improved competition and fairness, increased efficiency and better service delivery. Monitoring anomalous procurement behavior, even when that behavior isn't actually the result of a corrupt or illicit process, can help governments identify and resolve overarching inefficiencies in the procurement ecosystem.

Red flags in the real world

We have observed how red flags are being applied by governments, academia, civil society and the private sector to detect risks and improve public procurement.

In the **Dominican Republic**, the country's procurement agency (DGCP) monitors all procurement processes in real time using 21 targeted red flags. This risk monitoring system is one of several anti-corruption reform measures that have resulted in more than 60 suppliers being debarred for violations in 2023, and a reduction in unresolved complaints and canceled tenders. The proportion of open procedures further increased from 94% in 2020 to 96%, and single-bid tenders decreased across all methods – from 63% in 2020 to 60% in 2023. The measures seem to have increased trust: more than 20,000 new suppliers registered, competition is growing across open procurement processes, and supplier diversity is up 27%.

In 2022, **Italy's** Anticorruption Agency (ANAC) launched a public business intelligence tool and a red flagging tool for automating the detection of corruption risks, which it co-designed with academics and experts. The red-flagging tool applies more than 70 indicators, including 17 related to procurement, to assess risks at the municipal and regional level. These data tools are used as a resource across government for tasks such as preparing government entities' annual anti-corruption plans, as well as budgeting, setting reference prices, vendor due diligence, EU reporting, and auditing. ANAC is also institutionalizing collaboration with civil society. Italy's digital, whole-of-government approach to oversight has led to annual savings of up to 10-20% (around €935 million) in the health sector alone and the detection of about one case of corruption per week, among other results.

In **Kazakhstan**, the private sector company Datanomix started creating business intelligence software for government agencies in 2010. Their newest platform redflags.ai aggregates procurement data from various official sources. It is used by government procurement officers and high-level authorities, who can sign up to get automated alerts when potential fraud and corruption risks are detected. These are some of the documented impacts of their solutions:

✓ In 2010, Kazakhstan's financial police used the data generated by Datanomix to open 120 criminal cases, netting the government $77 million in recovered costs. In just two years, 2013 and 2014, the financial police were able to document damages of $647 million to the government, leading to over 630 criminal cases.

✓ Kazakhstan's government has reported savings of $86 million by using redflags.ai to identify and mitigate procurement risks.

✓ Datanomix developed a solution for the General Prosecutor's Office, to help prosecutors identify economic and corruption risks in procurement that led to the cancellation of 505 illegal tenders worth a total of $331 million in 2021.

✓ They partnered with the civil society organization Adildik Joly to detect unlawful VAT refunds to contractors. Using red flags analytics, they were able to detect violations. About $400,000 was returned to the state budget and a proposal to close the loophole was submitted to the finance ministry.

In **Indonesia**, the civil society organization Indonesia Corruption Watch uses data and red flags to enhance data-driven monitoring of public complaints and audits. The data helps civil society monitors to submit high quality complaints to authorities about risky procurement procedures. It enables monitors to prioritize which procedures to review, and facilitates a structured, replicable process for gathering evidence. Their approach has led to improvements in the quality of public complaints, with the rejection rate decreasing from 78% in 2021 to 39% in 2022. The number of complaints resolved by the internal auditing authority has increased, and complaints are resolved more efficiently (on average 76 days faster). The red flags tool opentender.net also offers auditors a more objective method for determining which procedures to audit compared to relying on the discretion of local authorities.

Are you using red flags and interested in sharing the results from your work? Reach out to data@open-contracting.org

The value of using standardized data for red flag detection

Our methodology to calculate red flags indicators uses standardized public procurement data. It is supported by a growing community of publishers and users of data published in the Open Contracting Data Standard (OCDS)[1]. Our approach is simple: We compiled a list of the most relevant red flags indicators according to the academic literature, international best practice and practical implementations, and reviewed which data fields are needed to calculate the indicators. We then mapped these fields into OCDS and developed formulas for each indicator to help users with the calculation. We can then test those indicators using real data from publishers across the world.

While this guidance can be used with other types of procurement data, the methodology and indicators are easier to implement with data published using the OCDS:

✓ Standardized data allows for a **quick assessment of the feasibility** of calculating red flags indicators. At OCP, we have tools to check which publishers have the necessary fields to calculate red flags indicators from the methodology and identify data gaps.

✓ Standardized data facilitates the **creation of tools to automate the calculation of red flag indicators**. At OCP, we built an open-source "public procurement red flags library," Cardinal, that automates the calculation of some red flags. This information can then be used in business intelligence tools to enhance procurement monitoring.

✓ The OCDS provides a **flexible, extendible schema** for unifying documents and records across the entire procurement system. This allows for disparate data fields or data models to be translated, organized, mapped and transposed onto one another. It also makes

[1] OCDS enables disclosure of data and documents at all stages of the contracting process by defining a common data model. It was created to support organizations to increase contracting transparency, and allow deeper analysis of contracting data by a wide range of users

it easier to **tailor the indicators** depending on the context and think about edge cases. For instance, when developing Cardinal we added global configurations that may apply to multiple publishers, such as excluding specific procedures from the calculation of certain red flags.

✓ Standardized data facilitates the **detection and correction of data quality issues**, since, once the data is standardized, you can compare and correct errors across datasets from different jurisdictions. See the prepare command in Cardinal.
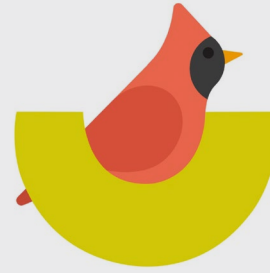
Check out Cardinal, an OCP open source library that automates the calculation of red flags indicators using OCDS data.

The data fields that are most needed for red flag detection

The data needed to calculate red flags will depend on the indicators selected. However, we have identified which fields are most useful based on how often they are needed to calculate specific indicators. We selected the most relevant fields based on the list of flags available in the annex of this guide.

This list can help you assess quickly if you have those data fields already or what information you can start collecting. Keep in mind that most indicators require the combination of fields, so we recommend publishing as many as possible so that your opportunities for analysis are greater. Note that these are not the only fields needed for red flags, but the ones that are most relevant.

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Table 1. Most useful data fields to calculate red flags indicators

Type of fields	Why it is useful	OCDS fields
Procurement method	It is important to know the procurement method used, since each method will have different rules and characteristics, and will present different types of risks.	tender/procurementMethod
		tender/procurementMethodDetails
Details about the procuring entity or buyer	A key field in any procurement dataset is who is buying. To understand the scope of your analysis you need to know which procuring entities or buyers are covered in the dataset, since some red flags could be more relevant for specific entities, or where the unit of analysis is the buyer. In OCDS, the procuring entity is the one managing the procurement. This can be different from the buyer, which is an entity whose budget will be used to pay for goods, works or services related to a contract. In some cases both could be the same.	buyer/id
		buyer/name
		tender/procuringEntity/id
		tender/procuringEntity/name
Details about the bidders participating in the process	The bidders or tenderers are the entities that submit a bid in a procedure. Publishing the information of all the bidders that participate in a procedure including their name and identifier (ID), and details such as their contact points, shareholders and beneficial owners, is very useful to calculate red flags related to collusion and can help you identify if firms that are related are bidding in the same process.	bids/details/tenderers/id
		bids/details/tenderers/name
		tender/tenderers/id
		tender/tenderers/name
		parties/address/streetAddress
		parties/address/postalCode
		parties/contactPoint/telephone
		parties/contactPoint/email
		parties/contactPoint/url
		parties/beneficialOwners/id
		parties/beneficialOwners/name
		parties/shareholders/shareholder/id
		parties/shareholders/shareholding
Details about the awarded supplier	This is useful to know who won the award.	awards/suppliers/id
		awards/suppliers/name
Details of the individual bids	The details of the individual bids including the value and dates are very useful to calculate red flags related to collusion, since they can help detect how suppliers could be coordinating their prices to rig the process and predetermine the winner.	bids/details/id
		bids/details/status
		bids/details/value/amount
		bids/details/value/currency
		awards/relatedBid
		bids/details/date
Values across the different stages of the process	It is important to know how much the procurement process costs. We recommend publishing values across the different stages of the process to have a full picture of how values could have changed in the process; for instance, you can compare the final value of the contract to the initial estimated price. These values are needed for different types of red flags.	awards/value/amount
		awards/value/currency
		tender/value/amount
		tender/value/currency
		contracts/value/amount
		contracts/value/currency
		contracts/implementation/finalValue/amount
		contracts/implementation/finalValue/currency
		contracts/implementation/transactions/value/amount
		contracts/implementation/transactions/value/currency

Dates across the different stages of the process	The dates of the different stages of the process are particularly useful to calculate indicators about bid rigging, for instance if the periods are too long or too short, or to analyze red flags by periods.	tender/tenderPeriod/startDate
		tender/tenderPeriod/endDate
		tender/bidOpening/date
		tender/awardPeriod/startDate
		awards/date
		contracts/dateSigned
		contracts/implementation/milestones/dateMet
		contracts/implementation/milestones/dueDate
Items procured	These fields help you understand what is being bought. The items can help you calculate specific red flags by markets or analyze similar procedures. We recommend publishing items across the different stages of the process, but if the items are only available for one stage you can still calculate red flags that need item-related information.	tender/items/classification/id
		tender/items/classification/scheme
		awards/items/classification/id
		awards/items/classification/scheme
		contracts/items/classification/id
		contracts/items/classification/scheme
Key documents	There are <u>many documents</u> that can be published across the different stages of the process. For red flags, the documents that detail the tender specifications, evaluation criteria, the final contract or implementation reports can be particularly helpful.	planning/documents/documentType = plannedProcurementNotice, procurementPlan, marketStudies, feasibilityStudy, projectPlan
		tender/documents/datePublished
		tender/documents/documentType = eligibilityCriteria, technicalSpecifications, complaints, tenderNotice, biddingDocuments, evaluationCriteria
		bids/documents/documentType = biddingDocuments
		contracts/documents/documentType = contractSigned
		contracts/implementation/documents/documentType = completionCertificate, physicalProgressReport, finalAudit
Contract implementation details, including amendments, milestones, subcontracts and related procedures.	Contract implementation fields are useful for red flags that check if any changes have been made to the original contracts, if the milestones are delivered on time and red flags related to subcontracts.	contracts/amendments/description
		contracts/amendments/rationale
		contracts/implementation/milestones/type
		contracts/relatedProcesses
		contracts/relatedProcesses/relationship
		awards/hasSubcontracting
		awards/subcontracting/minimumPercentage
Other information including status of the awards and contracts, eligibility and award criteria	These fields are useful for different red flags since they help filter for which types of awards or contracts the red flags can be calculated. For instance, some flags might only be applicable to tenders where the criteria is price only, or for active awards.	tender/awardCriteria
		tender/eligibilityCriteria
		awards/status
		contracts/status

How to implement red flags in practice

Implementing red flags in practice involves a multi-step process. Whether you are a government agency trying to use data for risk detection or civil society interested in creating a monitoring platform, in this section we describe the key steps we recommend to take when embarking on a red flags project.

1 Understand your context

In this guidance we have compiled a list of relevant integrity indicators based on academic evidence and practical applications with global relevance. However each region and country has different geographic, economic, social, and cultural contexts, and to have a robust and valid implementation of a red flags initiative, risk proxies need to be adapted to local regulatory and market contexts.

The first step to do this is to understand how procurement works in the context and which laws and regulations apply. The regulatory framework can inform how the procurement process is conducted, which acts are prohibited or can be sanctioned and who is responsible for monitoring and enforcing the regulations.

For example, in Chile, the public procurement law regulates conflicts of interest, and details which actors are prohibited from participating in public procurement. These provisions in the law can then be translated into red flags indicators that could help detect conflicts of interests using data.

In addition, it's important to review the current monitoring process (if one exists), to identify how it is conducted, what types of risks are monitored, who is involved, how are those risks detected, what actions are taken and what other risks could be relevant for the context but are not currently monitored. This exercise can involve conducting user research activities, workshops or in-depth interviews with the relevant stakeholders involved in existing monitoring initiatives or that will be future users of the red flags.

Key outputs of this step:

- ☑ Description of the most relevant risks in the context and which problems aim to be addressed as part of the red flags initiative.

- ☑ Understanding of the legal framework and the monitoring process that can inform the relevance and application of red flags indicators.

- ☑ Identification of the relevant stakeholders that are or will be involved in the monitoring process.

2 Select the indicators

Once you are clear about the legal framework, monitoring workflows and most relevant risks in your procurement context, the next step is to translate those risks into red flags indicators. In some cases a single risk can translate into a single indicator but in other cases multiple indicators can help you detect the same risk. For example, if one of the most common procurement risks in the market is collusive bidding, you can select a list of collusion red flags to triangulate your data and evaluate that risk more effectively.

In addition, you should think about the stage of the process where the indicator can be detected. For example the red flag short or inadequate notice to bidders to submit expressions of interest or bids, can be detected at the tender stage. This is helpful, because in some cases, red flags at earlier stages of the process can allow for corrective actions to be taken before the contract is awarded.

In our list of red flag indicators (see annex), we tried to include the most common risk metrics in procurement, however, we do not see our review as exhaustive or completely representative of the field of integrity as a whole, and based on the specific risks you want to detect you could include new indicators.

In general, we recommend to focus on the quality of indicators instead of quantity (having a very long list of metrics), and prioritizing red flags that are:

✓ **relevant** for you context and goals;

✓ **specific**, meaning that they are clearly defined and have clear scope (you don't want very broad indicators that could not be informative and generate noise);

✓ **measurable**, they should be quantifiable and have a clear unit of measurement (we will explore this in the next section); and

✓ **achievable** and realistic to calculate them based on the available data (see next section).

In addition, we encourage to identify for the indicators:

✓ **Who** is this indicator relevant for (e.g. a monitoring official).

✓ **Why** is the red flag relevant for the local context.

✓ **When** can the indicator be detected (e.g. at which stage of the process or in which specific steps in the workflow of the monitoring tasks it can appear or be monitored).

✓ **What** can be done after the risk is detected. For instance, some red flags may be a direct violation of the law and the entity might have the legal mandate to cancel the process or send a notification to amend it.

We recommend defining the workflow and actions that can be taken once the red flags are detected. For each indicator it is important to identify what potential actions it can trigger and what is the workflow. Depending on the local regulations, the legal mandates of the entity implementing the red flags project and the types of indicators, different actions could be taken when a red flag is detected. Being able to take corrective measures when risks are detected can increase the use and value of a red flags initiative. For example:

- *Amend the process or take action.* In the Dominican Republic, the public procurement agency has an internal alert system that calculates automated alerts. When an alert is detected, the system automatically sends an email notification to the procuring entity, outlining the flag detected, an explanation of the alert and guidance on potential next steps. In some contexts procuring entities can cancel the process or dictate sanctions.

- *Using the red flags results as input for investigations, reports or analysis.* In other cases, while the regulations might not allow immediate action when a flag is detected, the results can be used for different purposes, such as inputs for internal or external reports or investigations, or to devise appropriate prevention measures.

Key outputs of this step:

☑ A list of prioritized red flags indicators and workflows.

3 Identify the data needs

Each red flag indicator will need specific data fields to be calculated. This step will help you further prioritize the list of indicators, by assessing the feasibility of its calculation, based on the data availability.

In this guidance we have mapped all of our red flag indicators to the Open Contracting Data Standard (OCDS), to help users identify the data they need.

For example:

Red flag	Data fields needed	OCDS fields

Single bid received	• Procurement method used
	• Number of bids received
		`tender/procurementMethod`
		`tender/numberOfTenderers,` OR
		`tender/tenderers/id` OR
		`bids/details/tenderers/id`

For the information needed for each indicator you should:

1. Identify the data sources

Identify which IT systems capture and store contracting data and related documents. You also need to identify how to connect data held in different systems, to get a complete picture of the contracting process. OCP's Data Support Team can help you assess the systems and data, and guide you on how to structure and publish it in OCDS.

2. Assess the access to the data

Once you have identified the sources, you need to review how accessible that information is: is it already published, standardized, or even better, available in OCDS? Can it be accessed through an API or does the technical

team have direct access to the IT systems' databases?

If the data is already available in OCDS, OCP's Data Support Team can quickly assess if the selected indicators can potentially be calculated with the available data, based on the availability of fields. It can also assess non-standardized procurement information and advise on the feasibility of calculations, and think of strategies to digitize the information if it's not already collected in an IT system.

3. Check the data quality

The ability to define, quantify, metricize, collate and calculate risk indicators rests on

the quality and quantity of data available. For example if you only have data available for a very small subset of procedures (e.g. only the procedures from a single Ministry), this can limit the scope of the red flags that you can calculate. In addition, while certain fields can be available, the coverage may be too low to be insightful (e.g. bidders information only available for 10% of the open tenders).

For OCDS publications, OCP has a set of tools that can help assess the quality of OCDS data and can quickly identify potential quality issues that can affect the calculation of red flags.

4. Review other sources of information

While this guide focuses on calculating red flags using only procurement data, the potential of red flags analysis may increase when combining contracting data with other related information such as company registries, financial information, ownership information. If your indicators require information from other available sources, OCP can help you explore how to link this information. For example, including beneficial ownership information in your OCDS publication.

Key outputs of this step:

☑ A prioritized list of indicators with the available data fields needed for their calculation.

☑ An understanding of the available data sources and the process of extracting that information for analysis.

☑ Clarity on potential data quality issues that could limit the scope of the red flags initiative.

4 Calculate the red flags indicators

1. Define the calculation methods

Once you have prioritized the list of indicators with the needed data fields, you need to define the calculation methods for each. In this guidance we have provided formulas and guidance on the calculation methods for a list of red flags indicators, however in practice some of these formulas might need to be adjusted or tailored to fit the relevant context. For example, you might want to exclude specific procurement methods from the calculation.

OCP has also developed Cardinal, an open source library and command-line tool that uses OCDS data to automatically calculate red flags. While developing Cardinal we followed this methodology to implement the indicators and realized that in practice, a lot of the risk metrics need to be tailored for the context or can have different edge cases. We tried to incorporate a lot of these edge cases in the configuration of the indicators, e.g. which procurement methods to exclude or adding an option to configure threshold values, among others.

In addition, a red flag can be about a contracting process, buyer or procuring entity, tenderer, or market. Some flags might apply for multiple "units of analysis", for instance you could:

✓ flag the bidders that submit similar bid prices in the same procedure;

✓ flag the procedure where 2 bidders submitted similar bid prices;

✓ flag a buyer with a very high proportion of bid disqualifications;

✓ flag a market with a high concentration.

In this guidance we specify the unit of analysis for which each red flag can be calculated. You can see how this works in Cardinal.

2. Validate the results

When calculating red flags, it's important to keep in mind that the indicator signals a risk – it is not evidence that illicit behavior is present. A red flag helps draw attention to behavior that may warrant further scrutiny to

prove whether the action is: a) not at all illicit or suboptimal; b) not illicit, but suboptimal in terms of value for money, competitiveness, or quality service delivery; or c) illicit.

You should also consider if the results make sense; for example, if a flag is detected for 90% of the procedures, it's likely that there are many false positives, so you should check if any adjustments need to be made to increase the accuracy of the indicator.

Also, make sure you can interpret the results correctly. Some flags are binary in nature, meaning that they can be answered with a clear cut "yes/no" statement (e.g. *a tender received a single bid*), while for others the value can be a proportion, a difference or a ratio.

Key outputs of this step:

☑ The calculated red flags indicators.

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5 — Decide how to present the results

1. Aggregating the results

Once you are confident with the results, you can decide how to aggregate or present the metrics. For example, you can do **simple counts** of red flags by your unit of analysis (contracting process, bidder, buyer). This can be helpful to rank procedures, buyers, or bidders according to their "risk"; for example, ranking or analyzing the contracting processes with the highest number of red flags. You can

also decide how to combine the indicators, since there are red flags that can be related and their combination can signal a higher likelihood of other associated risks (see Tóth et al., 2015). For example, if you are trying to detect potential collusion, you might want to present the results showing those flags together.

Fig 1. Example from a Red Flags BI tool in the Dominican Republic showing a rank of procedures based on the number of collusion red flags detected.

In addition, you could calculate **descriptive statistics** from the results: Counts and proportions of red flags by different variables (item categories, buyers, geographic location, size of the contract, etc.), and correlations.

You could also create **risk indices and weights**, by aggregating indicators or assigning weights to the red flags. For example, the Corruption Risk Index (Fazekas, Tóth & King, 2016), assigns weights to red flags (corruption inputs) using regression analysis. You should make sure that the methodology used applies to your context. For example, re-using weights from other red flags applications might not be relevant in your situation.

Be transparent about the methodology used so your final users can interpret the results correctly and trust the scores.

2. Visualization interfaces

During the red flag implementation, it is important to consider how the final users will interact with the results and the design of the final interface, whether it is an internal alert system, a business intelligence tool or a red flags platform. Any of these will involve a separate stream of work, which will ideally include user research and a development process. While we don't detail this process here, OCP can support partners in co-creating

digital solutions, powered by open data, such as business intelligence tools and dashboards to monitor red flags (read more in our strategy).

For instance, OCP has worked with procurement agencies in the Dominican Republic (Dirección General Contrataciones Públicas or DGCP) and Ecuador (SERCOP) to build Power BI dashboards to visualize red flags, calculated with Cardinal using OCDS data. In Italy, the National Anticorruption Authority (ANAC) has a dashboard and red flags methodologies to analyze procurement risks in the country's public procurement market, which has led to successful results (read our story on how ANAC fights corruption using data). In the European Union, a project by academia and civil society organizations, C.O.R.E Corruption Risk indicators in Emergency, calculated corruption risk indicators particularly focused in an emergency period, and created dashboards to explore the risks across 4 different countries.

> **Key outputs of this step:**
> ☑ The red flags solution implemented.

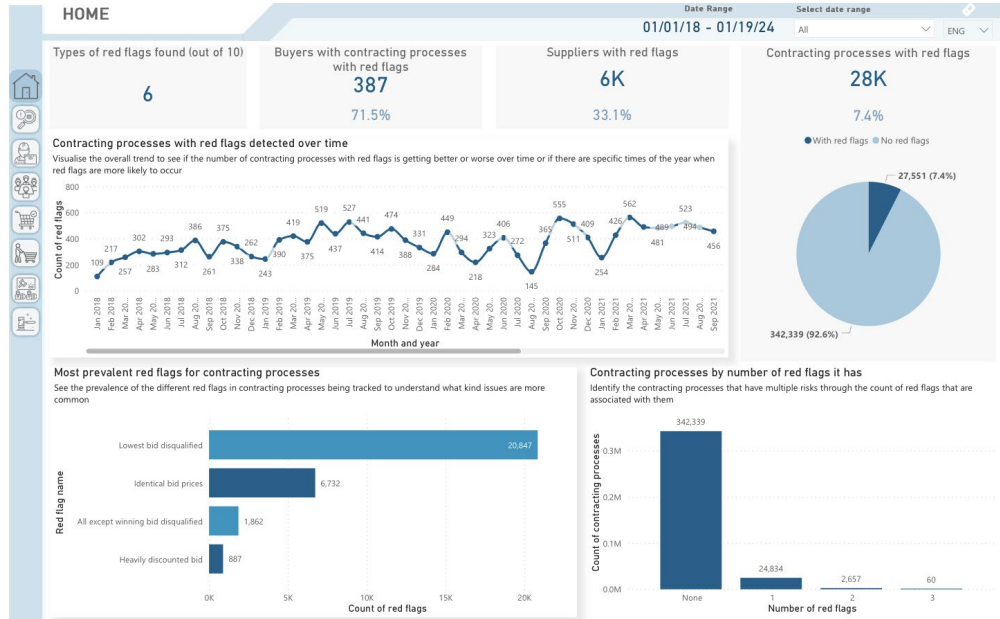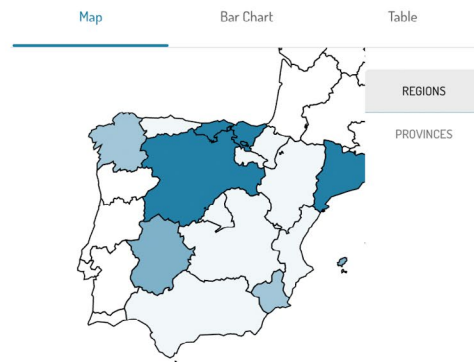*Fig 2. Example from the Red Flags BI tool in the Dominican Republic*
▶

Fig 3. Example from the C.O.R.E project dashboard visualizing a Composite indicator of corruption risks in an emergency.
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6 Implement an effective use and institutionalization strategy

An effective red flags initiative should detect risky behaviors in public procurement markets while acting as a deterrent for corruption and promoting public integrity. Having a clear institutionalization strategy for your red flag solution is a critical success factor to achieving this.

This involves being very clear about:

1. **The users of the red flags.** This should be already determined when prioritizing the most relevant risk indicators for the context, but it's also important to know who the main users of the red flag solution will be when it's launched, and to make sure they are trained on how to use it. To promote adoption, users should understand and see the value of using the red flags, for instance, for efficiency gains in their work (e.g. automated alerts allow a monitoring official to prioritize procedures to investigate).

2. **Make sure there is a clear workflow on how to use the red flags.** Red flags can trigger different actions and their detection can involve different stakeholders. At this stage it is key to ensure the workflow defined for each indicator is clear for the users involved. For instance, clarifying what actions a user can do when a red flag is detected (e.g. issuing a report, canceling the process, submitting the process to another agency for review, etc). We recommend conducting capacity building activities on how to use the solution, creating clear guidelines for its use and being open to making adjustments during the implementation phase.

3. **Institutionalizing the solution.** This can involve incorporating the red flags solution (or tool) in internal guidelines or regulations. For example, recommending the use of a red flags tool as part of the internal guidance of an entity, or embedding the red flags as part of the e-procurement system, so that they are part of the procurement process workflow (see the Inter-American Development Bank's work on implementing actionable red flags in Paraguay).

4. **Establish a monitoring plan.** Having an internal monitoring framework on the use of the solution can be a good way to evaluate its effectiveness and success.

Key outputs of this step:

☑ Red flags solution institutionalized with a monitoring plan implemented.

What are the red flags and how do you calculate them?

We prepared a list of some of the most relevant red flags that could be calculated across the different stages of the contracting process using procurement data. The list is based on academic evidence, best international practice and real practical implementations. We acknowledge that this is not an exhaustive list of all the possible red flags that could occur, nor does it completely represent the field of integrity as a whole. However, it does provide a good list of common risks that may serve as inspiration for metrics relevant to your context and that you can adapt so that it fits your goals.

In the annex, you will find a detailed description of 73 red flags indicators. For each red flag we include:

Definition

A definition of the indicator.

Stage

Stage of the process where the red flag can be detected:

| Planning | Tender | Award | Contract Implementation |

Why is this a red flag?

An explanation of why the indicator can be considered a procurement red flag.

Required data fields

The needed data fields to calculate the indicator and their corresponding field names in OCDS.

Methodology

A description of the methodology and calculation method of the indicators.

Unit of analysis

This indicates if the red flag can be calculated by:

| Contracting Process | Bidder | Buyer | Market |

Example

Examples of practical, real-world applications of the red flag for some indicators.

Source

Academic evidence on the use of the indicator.

Note: In practical implementations, you could re-classify the indicators in other categories that make more sense for your context.

Type of red flag*

We classify the red flags according to different categories based on the type of corruption risk or the most relevant topic. In the real world, one indicator may be associated with multiple forms of corruption and bad practices. For simplicity, our methodology assigns each indicator to one category only:

Low transparency

Indicators that show low transparency of the procurement process, which can increase the risk of corruption and opacity.

Collusion risks

Collusive tendering, occurs when businesses that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods or services for purchasers who wish to acquire products or services through a bidding process. (OECD)

Bid-rigging

The indicators in this category relate to schemes performed by corrupt officials, colluding firms or officials and firms acting together, to limit competition, avoid controls, rig the process or favor a supplier and exclude legitimate bidders.

Fraud

Indicators that could signal a deliberate deception intended to influence any stage of the process (e.g. providing false information).

Low competition

This category has indicators that signal low competition, which could be a result of other risks in the process. For instance a single bid could be the ideal corrupt outcome.

Below is a list of the red flags included in the annex. You can also explore the red flags in this spreadsheet, where you can filter by type of flag, stage of the process or unit of analysis, or keyword search for relevant data fields.

Table 3. List of procurement red flags

Low transparency red flags
R001 - Planning documents not available
R004 - Failure to adequately advertise the request for bids
R005 - Key tender information and documents are not available
R013 - High use of non competitive methods
R039 - Unanswered bidder questions
R063 - Contract is not published

Low competition red flags
R018 - Single bid received
R019 - Low number of bidders for item category
R040 - High share of buyers contracts
R050 - High market share
R051 - High market concentration

Fraud red flags
R042 - Bidder has abnormal address or phone number
R045 - Bidder is not listed in business registries
R046 - Bidder is debarred or on sanctions list
R047 - Supplier is not traceable on the web
R048 - Heterogeneous supplier
R064 - Contract has modifications
R065 - Contract amendments to reduce line items
R066 - Contract amendments to increase line items
R067 - Delivery failure
R068 - Contract transactions exceed contract amount
R069 - Contract amendments to increase price
R073 - Discrepancies between work completed and contract specifications

Collusion risk red flags
R017 - Unreasonably low or high line item
R022 - Wide disparity in bid prices
R023 - Fixed-multiple bid prices
R024 - Price close to winning bid
R025 - Excessive unsuccessful bids
R026 - Prevalence of consortia
R027 - Missing bidders
R028 - Identical bid prices
R032 - Bidders share same beneficial owner
R033 - Bidders share same major shareholder
R034 - Bids submitted in same order
R041 - Physical similarities in documents by different bidders
R044 - Business similarities between bidders
R053 - Co-bidding pairs have same recurrent winner
R057 - Bid rotation
R058 - Heavily discounted bid
R070 - Losing bidders are hired as subcontractors
R071 - A contractor subcontracts all or most of the work received
R072 - High prevalence of subcontracts

Bid rigging red flags
R002 - Manipulation of procurement thresholds
R003 - The submission period is too short
R006 - Unreasonable prequalification requirements
R007 - Unreasonable technical specifications
R008 - Unreasonable participation fees
R009 - Buyer increases the cost of the bidding documents
R010 - Unjustified use of non competitive procedure
R011 - Splitting purchases to avoid procurement thresholds
R012 - Direct awards in contravention to the provisions of the procurement plan
R014 - Short time between tender advertising and bid opening
R015 - Long time between bid opening and bid evaluation

R016 - Tender value is higher or lower than average for this item category
R020 - Tender has a complaint
R021 - High use of discretionary evaluation criteria
R029 - Bid prices deviate from Benford's Law
R030 - Late bid won
R031 - Winning bid price very close or higher than estimated price
R035 - All except winning bid disqualified
R036 - Lowest bid disqualified
R037 - Poorly supported disqualifications
R038 - Excessive disqualified bids
R043 - Bidder has same contact information as project official
R049 - Direct awards below threshold
R052 - Small initial purchase from supplier followed by much larger purchases
R054 - Direct award followed by change orders that exceed the competitive threshold
R055 - Multiple direct awards above or just below competitive threshold
R056 - Winning bid does not meet the award criteria
R059 - Large difference between the award value and final contract amount
R060 - Long time between award date and contract signature date
R061 - Decision period extremely short
R062 - Decision period extremely long

Conclusion

Government contracting is highly vulnerable to corruption. Data analytics can assist in detecting, deterring and even preventing illicit and wasteful procurement practices.

Procurement data can be used to calculate red flag indicators (also known as corruption proxies) to answer important questions about who is buying what, from whom, when, where, and on what terms.

This guide revisits OCP's tried-and-tested methodology for calculating risk indicators at all stages of the contracting process, to spot potential irregularities that warrant further investigation. The document offers step-by-step guidance on how to implement red flags in practice. It also explores 73 common indicators and the data fields needed to calculate them, mapped to the Open Contracting Data Standard (OCDS).

While this guidance can be used with other types of procurement data, the methodology and indicators are easier to implement with data published using the OCDS. A range of tools and support services are offered by OCP to assist governments, civil society and others working on implementing red flags initiatives.

How can OCP help?

Our global team has extensive expertise working with governments, civil society, academia and supplier networks to support the design of open contracting reforms related to integrity. We are here to help you:

✓ Identify the most relevant red flags for your context through user research activities

✓ Review your data sources, identify data quality issues and advise you on how to collect, analyze and publish open contracting data in OCDS

✓ Use our open source digital solutions to calculate red flags indicators

✓ Develop tools to visualize and interact with red flags

✓ Institutionalize your integrity reforms

✓ Measure the impact of your work

✓ Connect peers across governments and civil society to learn from each other

✓ Share good practice examples

Annex: Detailed red flag indicators formulas

This guide focuses on risk indicators that can be calculated using procurement data. You can also navigate the indicators in this spreadsheet, where you can apply filters to select the most relevant indicators.

R001 Planning documents not available

Stage

| Planning | Tender | Award | Contract Implementation |

Type of red flag
Low transparency

Definition

Key planning documents are not available in the publication. These can include: procurement plans, market studies, feasibility studies, among others. Check the OCDS document type codelist to see the possible documents.

Why is this a red flag

Governments should provide an adequate degree of transparency across the entire cycle of the procurement process to promote fair and equitable treatment of suppliers, and to facilitate oversight. A lack of planning documents could signal poor procurement planning or integrity risks since it does not allow to verify if the planned process responds to a real need.

Required data fields

Data fields needed	OCDS fields
• Planning documents	`planning/documents/documentType = plannedProcurementNotice, 'procurementPlan, marketStudies, feasibilityStudy, projectPlan`

Methodology

A contracting process is flagged if:

$planning/documents/documentType_i$ field is empty

Where i corresponds to each procurement process.

Alternative:

The planning documents or procurement plans are sometimes not linked to the procurement procedure and they may be available in a separate portal or data publication. In these cases the indicator can be adjusted to check if a buyer or procuring entity publishes the procurement plans.

Example

The Procurement Agency in Paraguay (DNCP), publishes this red flag to show which procuring agencies have not published the annual procurement plan.

Source

Based on OCED's Principles for Integrity in Public Procurement

Unit of analysis

| Contracting Process | Buyer |

R002 Manipulation of procurement thresholds

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Bid-rigging

Definition

A buyer bundles tenders below the competitive threshold.

See also *R011 - Splitting purchases to avoid procurement thresholds, R055 - Multiple direct awards above or just below competitive threshold.*

Why is this a red flag?

Non-competitive methods increase discretion, which can facilitate a corrupt buyer to award a contract to favored bidders.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Tender values and currency • Tender period start date (or publication date) • Name of the procuring entity or buyer. • Procurement category	tender/value/amount, tender/value/currency, tender/tenderPeriod/startDate, tender/procurementMethod, tender/procuringEntity/name OR buyer/name OR tender/procuringEntity/id OR buyer/id, Optional: tender/procurementCategory	Competitive procurement thresholds as stated by the local regulations.

Methodology

A buyer is flagged if it bundles contracting processes below threshold. For methods on how to detect bundling of tenders see sources below.

Source

Based on Compliance and strategic contract manipulation around single market regulatory thresholds – the case of Poland, Manipulation of Procurement Contracts: Evidence from the Introduction of Discretionary Thresholds, Bunching Below Thresholds to Manipulate Public Procurement

Unit of analysis

Buyer

R003 The submission period is too short

Stage

Planning | **Tender** | Award | Contract Implementation

Type of red flag
Bid-rigging

Definition

The period to submit bids is shorter than the legal threshold. The submission period starts with contracting documents being available to potential suppliers and ends with the submission deadline for expressions of interest or bids.

See also *R014 - Short time between tender advertising and bid opening.*

Why is this a red flag?

A short submission period leaves less time to prepare and submit bids. This makes it harder for non-connected companies to bid and to submit; well-connected firms can use their inside knowledge to win repeatedly. A corrupt buyer can give the predetermined bidder an unfair advantage by privately informing the predetermined bidder of the opportunity in advance, and by giving other bidders less time to prepare competitive bids.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Tender start and end date • Procurement method used	tender/procurementMethod tender/procurementMethodDetails for more detail on the specific methods tender/tenderPeriod/startDate, tender/tenderPeriod/endDate	Minimum submission period according to the local regulations

Methodology

A contracting process is flagged if:

$$(tender/tenderPeriod/endDate_i - tender/tenderPeriod/startDate_i) < minimumPeriod_m$$

Where i corresponds to each tender, and m to each procurement method. The minimum bidding period might vary depending on the method. It is important to check in local regulations if there is a minimum period.

This indicator is included in Cardinal.

Example

In Chile the Observatorio del Gasto Fiscal includes this red flag in their red flags portal (see flag *Failure to comply with the minimum publication deadline*)

Source

Based on "Shortened time span for bidding process" in Corruption in Public Procurement: Finding the Right Indicators, "Short submission period" in An Objective Corruption Risk Index Using Public Procurement Data, "Short or inadequate notice to bidders" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects, and "Deadline for submitting bids is very short" in Fraud in Public Procurement: A collection of Red Flags and Best Practices.

Unit of analysis

Contracting Process

R004 Failure to adequately advertise the request for bids

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Low transparency

Definition

Key tender documents (tender notice) are not available for bidders during the full tender period.

See also *R005-Key tender information and documents are not available.*

Why is this a red flag?

A corrupt buyer can favor a predetermined bidder and exclude other potential bidders by limiting access to bidding documents.

Required data fields

Data fields needed	OCDS fields

• Tender start date
 • Tender documents
 • Tender documents date published
	`tender/tenderPeriod/startDate,`
	 `tender/documents/documentType =`
	 `tenderNotice or biddingDocuments,`
	 `tender/documents/datePublished`

Methodology

For procedures where:

tender/documents/documentType$_i$= tenderNotice or biddingDocuments

A contracting process is flagged if:

tender/documents/datePublished > tender/tenderPeriod/startDate$_i$

Where *i* corresponds to each tender.

A procuring entity can limit access to tender documents using other methods that are harder to identify using specific data points such as "refusing to sell the documents to certain bidders, physically preventing the bidders from purchasing the documents, increasing the cost of the documents or falsely claiming that they are unavailable" (International Anti Corruption Research Center, 2012).

Source

Based on "Failure to Make Bidding Documents Available" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects

Unit of analysis

Contracting Process

R005 Key tender information and documents are not available

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Low transparency

Definition
Key tender documents are not available. These can include: the tender notices, bidding documents, technical specifications, evaluation criteria, key dates, etc. Check the OCDS document type codelist to see the possible documents.

See also *R004 - Failure to adequately advertise the request for bids.*

Why is this a red flag?
Governments should provide an adequate degree of transparency in the entire cycle of the procurement process to promote fair and equitable treatment of suppliers, and to facilitate oversight. Project officials can reduce competition and exclude qualified bidders by limiting access to bidding documents or not publishing key information about the tender.

Required data fields

Data fields needed	OCDS fields
• Tender documents • Key dates of the tender process	`tender/documents/documentType=(tenderNotice, biddingDocuments, technicalSpecifications, evaluationCriteria), tender/documents/datePublished, tender/tenderPeriod/startDate; tender/tenderPeriod/endDate`

Methodology
A contracting process is flagged if:

tender/documents/documentType$_i$ = tenderNotice, biddingDocuments, technicalSpecifications, evaluationCriteria
and tender/tenderPeriod/startDate and tender/tenderPeriod/endDate are empty

Where *i* corresponds to each procurement process.

Source
Based on *OECD's Principles for Integrity in Public Procurement* and "Failure to Make Bidding Documents Available" in *Guide to Combating Corruption & Fraud in Infrastructure Development Projects.*

Unit of analysis
Contracting Process

R006 Unreasonable prequalification requirements

Stage

Planning	**Tender**	Award	Contract Implementation

Type of red flag
Bid-rigging

Definition

The eligibility criteria is unreasonable.

See also *R007-Unreasonable technical specifications.*

Why is this a red flag?

Having restrictive prequalification requirements can be used to limit competition and facilitate the selection of a favored bidder, often as the result of corruption.

Required data fields

Data fields needed	OCDS fields
• Eligibility criteria Optional: • Procurement method • Item classification scheme and id (to compare tender with similar items)	tender/eligibilityCriteria OR tender/documents/documentType=eligibilityCriteria

Methodology

A contracting process is flagged if the eligibility criteria (in *tender/eligibilityCriteria or/and tender/documents/documentType=eligibilityCriteria*) is unusual, for instance it requires an unreasonably high level of prior experience or specific financial capacity.

You can look for previous similar tenders and compare the prequalification requirements or the local regulations to check which are the valid eligibility criteria that can be used. For example, you can focus the analysis by looking at the *"technical and professional capability"* in the tender documentation (see Rabuzin, K., & Modrusan, N. (2019)).

Source

Based on OECD's Principles for Integrity in Public Procurement and "Unreasonable Prequalification Requirements" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects.

Unit of analysis

Contracting Process

R007 Unreasonable technical specifications

Stage

Planning | **Tender** | Award | Contract Implementation

Type of red flag
Bid-rigging

Definition

The technical specifications are too broad or too narrow and seem to be tailored to a supplier. See also *R006-Unreasonable prequalification requirements.*

Why is this a red flag?

Project officials can deliberately draft inadequate bid specifications in order to facilitate the selection of a favored bidder.

Required data fields

Data fields needed	OCDS fields

• Technical specifications documents
• Item classifications
Optional:
• Procurement method
• Procuring entity name
• Tender value
	`tender/documents/documentType=technicalSpecifications`
	`tender/items/classification/id,`
	`tender/items/classification/scheme`
	Optional: `tender/procurementMethod,`
	`tender/procuringEntity/name` OR `buyer/name` OR
	`parties/id` and `parties/name with parties/roles=buyer,`
	`tender/value/amount`

Methodology

A contracting process is flagged if the technical specifications (in *tender/documents/documentType=technicalSpecifications*) are unusual, for instance if they are very specific or vague, in comparison to similar procedures in the same item category.

For examples on how machine learning methods and text-mining techniques can detect indications of corruption in the Public Procurement process using the content of the tender documentation as a data source, see Rabuzin, K., & Modrusan, N. (2019).

To check if this red flag is present you can run first R018-Single bid received, to check which item categories (sectors) have a higher rate of single bid tenders which is a likely corrupt outcome in the procurement process (see An Objective Corruption Risk Index Using Public Procurement Data), and then you can review the technical requirements in those tenders to look for unreasonable specifications.

Source

Based on OECD's Principles for Integrity in Public Procurement (p 53), "Vague, Ambiguous or Incomplete Specifications" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects, "Manipulation of tender specifications" and "Rigged technical specifications" in Fraud in Public Procurement: A collection of Red Flags and Best Practices and Prediction of Public Procurement Corruption Indices using Machine Learning Methods

Unit of analysis

Contracting Process

R008 Unreasonable participation fees

Stage

Planning	**Tender**	Award	Contract Implementation

Definition

The participation fees prices are not within legal parameters. Participation fees are often set as a fixed maximum or a percentage of total contract value.

Type of red flag
Bid-rigging

Why is this a red flag?

A corrupt buyer can favor a predetermined bidder and exclude other potential bidders by limiting access to bidding documents by increasing their price.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Tender participation fees	`tender/participationFees/value/amount,` `tender/participationFees/value/currency,` `tender/value/amount` See Participation fees extension	Legal parameters for participation fees.

Methodology

A contracting process is flagged if:

$tender/participationFees/value/amount_i > threshold$ value.

Where i corresponds to each tender, and the threshold value is defined according to the local regulations.

Source

Based on "Failure to Make Bidding Documents Available" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects

Unit of analysis Contracting Process

R009 Buyer increases the cost of the bidding documents

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Bid-rigging

Definition
The participation fees prices rise during the tender period.

Why is this a red flag?
A corrupt buyer can favor a predetermined bidder and exclude other potential bidders by limiting access to bidding documents.

Required data fields

Data fields needed	OCDS fields

• Tender participation fees
• Tender date
	`tender/participationFees/value/amount,`
	`tender/participationFees/value/currency,`
	`date`
	
	See Participation fees extension

Methodology

A contracting process i is flagged if the participation fee increases:

$tender/participationFees/value/amount_{it} > tender/participationFees/value/amount_{it\text{-}1}$

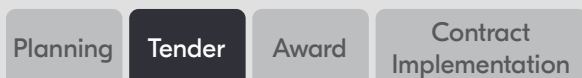where t can be defined using the *date* of the release.

Source

Based on "Failure to Make Bidding Documents Available" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects

Unit of analysis   Contracting Process

R010 Unjustified use of non competitive procedure

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Bid-rigging

Definition
The use of a non competitive method is not correctly justified or complies with the legal requirements.

Why is this a red flag?
While there are valid reasons to use non competitive procurement methods, its use must be justified and comply with legal requirements. A corrupt contracting authority can use more opaque methods to award the tender to the favored bidder.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Procurement method • Procurement method details • Procurement method rationale	tender/procurementMethod, tender/procurementMethodDetails, tender/procurementMethodRationale	Legal parameters for the use of non competitive methods.

Methodology
A contracting process is flagged if the procurement method rationale does not comply with the legal requirements.

Source
Based on "Absence of tendering or inappropriate procedure" and "Cases not justifying the use of the negotiated procedure without prior publication of a contract notice" in Public Procurement guidance for practitioners.

Unit of analysis
Contracting Process

R011 Splitting purchases to avoid procurement thresholds

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Bid-rigging

Definition

What should have been a single contract or purchase is split into two or more components, each below the relevant procurement threshold, to facilitate sole source or less competitive contract awards. See also *R002-Manipulation of procurement thresholds.*

Why is this a red flag

Project officials can split what should be a single contract or purchase into two or more components, each below the relevant procurement threshold, to facilitate direct or less competitive contract awards. (International Anti Corruption Research Center, 2012).

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Procurement method used (and procurement method details if available) • Item classification scheme and categories • Tender values and currency • Tender period start date • Name of the procuring entity or buyer.	`tender/procurementMethod`,` `tender/procurementMethodDEtails`,` `tender/items/classification/id,` `tender/items/classification/scheme,` `tender/value/amount,` `tender/value/currency,` `tender/tenderPeriod/startDate,` OR `tender/procuringEntity/name` OR `buyer/name` OR `tender/procuringEntity/id` `buyer/id`	Competitive procurement thresholds as stated by the local regulations.

Methodology

A group of contracting processes from the same buyer k are flagged if:

1. Two or more contracting procedures procuring the same item category are advertised in a short time period (e.g. three months) and fall just below the competitive threshold value.

The time period and the distance to the threshold value (e.g. 1%, 2%) can be defined based on the context.

Example: *Buyer K announces a direct contracting process A for item category X for $999. The same buyer announces a direct contracting process B for item category X for $995, two weeks after. The competitive threshold value is $1000.*

Contracting processes A and B, and buyer K are flagged.

Example

The Dominican Republic sanctions and regulates artificial contract splitting. Investigations by Civio and Diario.es, media organizations in Spain, illustrate how contract splitting can work in practice.

Source

Based on "Split purchases" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects and "Artificially splitting the contract value" in Public Procurement guidance for practitioners

Unit of analysis

Contracting Process   Buyer

R012 Direct awards in contravention to the provisions of the procurement plan

Stage

Planning | **Tender** | Award | Contract Implementation

Type of red flag
Bid-rigging

Definition
Direct award method is used in contravention to the provisions of the procurement plan.

Why is this a red flag?
Direct awards, while they are justified in specific conditions, sometimes can be used to avoid competition and award contracts to specific suppliers.

Required data fields

Data fields needed	OCDS fields

• Procurement method
• Procurement method details
• Planning documents
	`tender/procurementMethod,`
	`tender/procurementMethodDetails,`
	`planning/documents/documentType=procurementPlan` OR
	`plannedProcurementNotice`

Methodology

A contracting process is flagged if:

$tender/procurementMethod_i='direct'$ and a different procurement method is stipulated in the procurement plan or planned notice.
Where i corresponds to each tender

Source

Based on "Unjustified Sole Source Awards" in _Guide to Combating Corruption & Fraud in Infrastructure Development Projects_

Unit of analysis

Contracting Process

R013 High use of non-competitive methods

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Low transparency

Definition
The proportion of contracting processes for a buyer using the non competitive methods is a high outlier.

Why is this a red flag?
While there are valid reasons to use non-competitive procurement methods where only a select list of suppliers can participate or the contracting process is awarded directly without competition, these methods are by default less competitive and transparent.

Required data fields

Data fields needed	OCDS fields
• Procurement method • Buyer or procuring entity information	`tender/procurementMethod, tender/procuringEntity/name` OR `buyer/name` OR `parties/id` and `parties/name` with `parties/roles=buyer`

Methodology

1. A buyer is flagged if

$$\frac{\textit{\# Contracting processes using non competitive methods}}{\textit{Total number of contracting processes}} > \textit{threshold value}$$

If there is no threshold value (e.g 30%), the buyer can be flagged if the proportion of non competitive procedures is greater than or equal to the *upper fence* of Q_3 + 1.5(IQR) where Q_3 is the third quartile and IQR is the interquartile range for the proportions of all buyers.

Example

The European Commission Single Market Scorecard includes the proportion of direct awards as one of the 12 performance indicators they report, to measure key issues on public procurement performance across the European Union countries.

Source

Based on "Procedure type" in An Objective Corruption Risk Index Using Public Procurement Data and Uncovering High-Level Corruption: Cross-National Corruption Proxies Using Government Contracting Data, "Percentage of public contracts awarded without competition" in UNODC Statistical framework to measure corruption, "Non-competitive processes" in Governance Risk Assessment System (GRAS) Advanced Data Analytics for Detecting Fraud, Corruption, and Collusion in Public Expenditures.

Unit of analysis

Buyer

R014 Short time between tender advertising and bid opening

Stage

| Planning | Tender | Award | Contract Implementation |

Type of red flag
Bid-rigging

Definition

Length of time between tender advertising and bid opening falls below a threshold value.
See also *R003 - The submission period is too short, R015 - Long time between bid opening and bid evaluation.*

Why is this a red flag?

Project officials can deliberately fail to provide adequate notice for companies to prepare bids or proposals in order to benefit a favored bidder, often as the result of corruption.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Tender period start date • Bid opening date	tender/bidOpening/date, tender/tenderPeriod/startDate, tender/procurementMethod Check Bid opening extension	Minimum period according to the local regulations

Methodology

A contracting process i is flagged if:

$$(tender/bidOpening/date_i - tender/tenderPeriod/startDate_i) < period_m$$

Where i corresponds to each tender, and m to each procurement method. The period might vary depending on the method. It is important to check in local regulations if there is a specific period. Alternatively the period can be calculated as the *lower fence* of Q_1-$1.5(IQR_m)$ where Q_1 is the first quartile and IQR_m is the interquartile range for the set of durations for procurement method m.

Source

Based on "Short or Inadequate Notice to Bidders" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects and "Length of advertisement period" in Uncovering High-Level Corruption: Cross-National Corruption Proxies Using Government Contracting Data.

Unit of analysis
Contracting Process

R015 Long time between bid opening and bid evaluation

Stage

Planning | **Tender** | Award | Contract Implementation

Type of red flag

Bid-rigging

Definition

Time between bid opening and bid evaluation falls above threshold value. See also *R014 - Short time between tender advertising and bid opening, R003 - The submission period is too short.*

Why is this a red flag?

A long time between bid opening and evaluation could indicate that project officials want to favor a particular contractor. It is recommended that bids are evaluated immediately after the closing of the bid submission.

Required data fields

Data fields needed	OCDS fields	Additional information needed

• Tender period start date
• Bid opening date
	`tender/bidOpening/date,`
	`tender/awardPeriod/startDate,`
	`tender/procurementMethod`
	
	Optional:
	`tender/procurementMethodDetails`
	
	Check <u>Bid opening extension</u>
		Maximum period according to the local regulations

Methodology

A contracting process i is flagged if:

$$(tender/awardPeriod/startDate_i - tender/bidOpening/date_i) > period_m$$

Where i corresponds to each tender, and m to each procurement method. The period might vary depending on the method. It is important to check in local regulations if there is a specific period. Alternatively the period can be calculated as the *upper fence* of $Q3 + 1.5(IQR_m)$ where $Q3$ is the third quartile and IQR_m is the interquartile range for the set of durations for procurement method m.

Source

Based on *"Unclear or subverted processes"* in <u>*Warning signs of Fraud and Corruption in Public procurement*</u>.

Unit of analysis

Contracting Process

R016 Tender value is higher or lower than average for this item category

Stage

| Planning | Tender | Award | Contract Implementation |

Type of red flag
Bid-rigging

Definition

Tender value is threshold distance from mean for item category.

Why is this a red flag?

A larger variation of the tender value (in the same item categories) across different tenders can indicate lower value for money. Price differences in the same item across multiple contracting processes can also provide information about how competitive and efficient the procuring entity is. In addition, lower than average tender values for the same item category could indicate a procuring entity is lowering the value to avoid competitive thresholds.

Required data fields

Data fields needed	OCDS fields

• Tender value amount
• Tender value currency
• Tender item classification id and scheme
Optional:
• Procurement method and procurement method details
	`tender/value/amount, tender/value/currency, tender/items/classification/id, tender/items/classification/scheme, tender/procurementMethod`
	Optional:
	`tender/procurementMethodDetails`
	
	Note: If items are not available at the tender level, award items or contract items could be used instead.

Methodology

1. A contracting process is flagged if:

   a. The tender value ($tender/value/amount_i$) is greater than or equal to the *upper fence* of $Q_3 + 1.5(IQR_j)$ where Q_3 is the third quartile and IQR_j is the interquartile range for the tender values of the item category j using the same procurement method.

   b. The tender value ($tender/value/amount_i$) is less than or equal to the lower fence of $Q_3 + 1.5(IQR_j)$ where Q_3 is the first quartile and IQR_j for the tender values of the item category j using the same procurement method.

Source

Based on "Unreasonably High Line Item Bids" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects.

Unit of analysis

Contracting Process

R017 Unreasonably low or high line item

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Collusion risks

Definition
The item value is threshold distance from the mean for the item category.

Why is this a red flag?
Unreasonably high line item bids can indicate the bidder is deliberately inflating their bid prices. In addition, lower than average line item bids can indicate a bidder is submitting a low bid to unfairly eliminate competitors with the intention of increasing the price through amendments or in defiance of a collusive group.

Required data fields

Data fields needed	OCDS fields

• Unit values amount
• Items classification schemes
	`tender/items/unit/value/amount,`
	`tender/items/unit/value/currency,`
	`tender/items/classification/id,`
	`tender/items/classification/scheme`
	
	Also the `bids/details/value/amount, bids/details/value/currency` fields could be used.
	
	Note: If items are not available at the tender level, `award` items or `contract` items could be used instead.

Methodology

1. Verify that all the procedures have the same *tender/unit/value/currency* and that *tender/items/classification/scheme* and *tender/items/classification/id* is present.

2. A contracting process is flagged if:

   a. It has an item with a unit value (*tender/unit/value/amount$_i$*) that is greater than or equal to the upper fence of Q_3+1.5(IQR_j) where Q_3 is the third quartile and IQR_j is the interquartile range for the unit values of the item category *j*.

   b. It has an item with a unit value (*tender/unit/value/amount$_i$*) that is less than or equal to the lower fence of Q_1+1.5(IQR_j) where Q_1 is the first quartile and IQR_j for the tender values of the item category *j*.

Source

Based on "Leaking of tender information" in <u>Fraud in Public Procurement: A collection of Red Flags and Best Practices</u> and "Unreasonably Low Line Item Bids" and "Unreasonably High Line Item Bids" in <u>Guide to Combating Corruption & Fraud in Infrastructure Development Projects</u>.

Unit of analysis
Contracting Process

R018 Single bid received

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
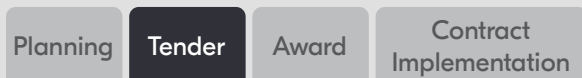
Low competition

Definition

Only one tenderer submitted a bid.

Why is this a red flag?

In a competitive procedure, a lack of competition might correspond to a suppression of competition and can represent the ideal outcome for a corrupt buyer and predetermined bidder.

Required data fields

Data fields needed	OCDS fields
• Procurement method used (and procurement method details if available) • Number of bidders	`tender/procurementMethod,` `tender/numberOfTenderers,` OR `tender/tenderers/id` OR `bids/details/tenderers/id`

Methodology

A contracting process is flagged if the number of tenderers is 1 and the procurement method is competitive (*tender/procurementMethod = 'open' OR 'selective'*).

This indicator is included in Cardinal.

Example

The European Commission Single Market Scorecard includes the proportion of single bid tenders as one of the 12 performance indicators they report, to measure key issues on public procurement performance across the European Union countries.

Source

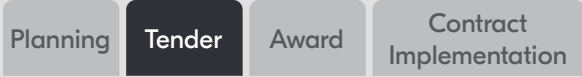Based on "Single bidder" in *An Objective Corruption Risk Index Using Public Procurement Data*

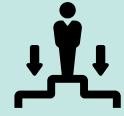## Unit of analysis

Contracting Process

R019 Low number of bidders for item category

Stage

Planning | **Tender** | Award | Contract Implementation

Type of red flag
Low competition

Definition
Number of bidders significantly lower than average, based on prior similar contracts (for similar items or procuring entities).

Why is this a red flag?
A lower number of bids indicates a decrease in competition that could facilitate the ideal outcome for a corrupt buyer to award the contract to a predetermined bidder.

Required data fields

Data fields needed	OCDS fields

• Procurement method used
• Item classification id and scheme.
• Number of bids received
	`tender/procurementMethod,`
	`tender/items/classification/id,`
	`tender/items/classification/scheme,`
	`(tender/procuringEntity/name` OR `buyer/name` OR `tender/`
	`procuringEntity/id` OR `buyer/id),`
	`(tender/numberOfTenderers` OR `tender/tenderers/id` OR `bids/`
	`details/tenderers/id)`

Methodology

This indicator should be calculated for item categories with high competition, defined as an item category where the average number of bids is higher than a threshold value that can be set by the user.

A contracting process i is flagged ($R019_i = 1$) if:

1. The procurement method is competitive

   $tender/procurementMethod$ = '$open$' OR '$selective$' and the $Number\ of\ tenderers_{i,j}$ < $Average\ tenderers_j$, where i corresponds to each tender, and j to each item category.

Source

Based on "Number of bidders is significantly lower than the average in other similar tenders" in Fraud in Public Procurement: A collection of Red Flags and Best Practices

Unit of analysis
Contracting Process

R020 **Tender has a complaint**

Stage

| Planning | Tender | Award | Contract Implementation |

Type of red flag

Bid-rigging

Definition

The contracting process has at least one complaint.

Why is this a red flag?

Losing or excluded bidders can submit complaints that could signal misconduct or corrupt cases in the contracting process.

Required data fields

Data fields needed	OCDS fields
• Complaints	`complaints/id` Optional: `complaints/documents` OR `tender/documents/documentType` = `complaints` to explore the details of the complaint. See: complaints extension

Methodology

A contracting process i is flagged if it has a complaint.

You can check the complaints documents for details on the type of complaint.

Source

Based on "Complaints from Losing and Excluded Bidders" in Fraud in Public Procurement: A collection of Red Flags and Best Practices and "Complaints" in Warning signs of Fraud and Corruption in Public procurement.

Unit of analysis   Contracting Process   Bidder

R021 High use of discretionary evaluation criteria

Stage

Planning | **Tender** | Award | Contract Implementation

Type of red flag
Bid-rigging

Definition The proportion of contracting processes for a buyer using the non price evaluation criteria is a high outlier. A contracting process is flagged if the weight of the non-price criteria is above a specific threshold.

Why is this a red flag?

In a poorly controlled bidding process project officials can tamper with bids after receipt to ensure that a favored contractor is selected. Non-price evaluation criteria, for instance the Most Economically Advantageous Tender criteria (MEAT) tend to be more subjective allowing issuers to favor the well-connected company, for instance:

- Non-price related evaluation criteria have been found to be associated with a higher probability of a single bid received (Fazekas et. al, 2016).

- Research in Italy found that the association between the MEAT criterion and corruption risk is stronger the more the scoring rule assigns points to qualitative (as opposed to quantitative) parameters (Decarolis, F. and Giorgiantonio, C., 2022)

⚠️ However, relying exclusively on price alone can be found to be counterproductive to achieving other procurement outcomes and strategies (e.g. sustainability goals) and non-price evaluation criteria may be recommended in specific markets. For instance the 2014 European Directives on public procurement provide for the MEAT criterion as the ordinary criterion for awarding public contracts and the European Commission Single Market Scorecard Indicator 6 recommends that the use of award criteria based on price alone should be less than 80%.

Required data fields

Data fields needed	OCDS fields

• Tender award criteria
 • Buyer id
 Optional:
 • Award criteria details
 • Item classifications to analyze specific sectors only.
	To calculate for the buyer:
	 `tender/awardCriteria` = 'qualityOnly' OR 'ratedCriteria', `tender/procuringEntity/name` OR `buyer/name` OR `parties/id` and `parties/name` with `parties/roles=buyer`
	 Optional:
	 `tender/awardCriteriaDetails,` to analyze the details of the award criteria. `tender/items/classification/id` to analyze by specific sectors.
	
	 To calculate for the contracting process:
	 `tender/lots/awardCriteria/criteria/number/number`
	 `tender/lots/awardCriteria/criteria/type`
	
	 See award criteria breakdown extension

Methodology

1. A buyer m is flagged ($R021_m = 1$), where m corresponds to the buyer if

$$\frac{\text{\# Contracting processes using non-price criteria}}{\text{Total number of contracting processes}} > threshold\ value$$

2. A contracting process i is flagged ($R021_i = 1$), where i corresponds to the individual contracting process, if: *weight of non price criteria > threshold value.*

Unit of analysis

Contracting Process | Buyer

Source

Based on "non-price evaluation criteria" in "An Objective Corruption Risk Index Using Public Procurement Data" and "awarding criteria" in Corruption red flags in public procurement: new evidence from Italian calls for tenders (2022) and (2020).

Wide disparity in bid prices

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag

Collusion risks

Definition

The bid price range in the same contracting process is greater than a threshold value.

Why is this a red flag?

A colluding bidder can mimic competition by coordinating a collusive agreement with their colluding partner to prearrange the bid prices beforehand and therefore there is no real competition. Extreme or unusual offer price distributions are found to signal collusion by academic literature Abrantes-Metz et al. (2006), Padhi and Mohapatra (2011).

Required data fields

Data fields needed	OCDS fields
• Individual bid data and their amounts.	`bids/details/id,` `bids/details/value/amount,` `bids/details/value/currency,` `bids/details/status`

Methodology

1. For each contracting process with more than 1 valid bid, the *bid price range* is calculated:

$$\frac{(highestBidAmount - LowestBidAmount)}{MEAN(BidAmounts)}$$

2. A contracting process is flagged if the difference is higher than or equal to the *upper fence* of Q_3+1.5(IQR) where Q_3 is the third quartile and IQR is the interquartile range for the set of differences.

Source

Based on "Bid price range" in <u>*Assessing the potential for detecting collusion in Swedish public procurement*</u>.

Unit of analysis

Contracting Process

R023 Fixed-multiple bid prices

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Collusion risks

Definition
The percentage difference between two tenderers' bid prices is the same in different contracting processes.

Why is this a red flag?
A colluding bidder can mimic competition by coordinating a collusive agreement with their colluding partner to prearrange the bid prices beforehand and therefore there is no real competition.

Very similar or equal bid prices is considered a signal of potential collusive agreements between bidders. Also extreme or unusual offer price distributions are found to signal collusion by academic literature Abrantes-Metz et al. (2006), Padhi and Mohapatra (2011).

Required data fields

Data fields needed	OCDS fields

• Individual bid data and their amounts.	`bids/details/id,`
	`bids/details/value/amount,`
	`bids/details/value/currency,`
	`bids/details/status`

Methodology
For each bidder pair A and B participating in the same process i, the ratio of their bid prices is calculated as:

$$\frac{bidPrice_A}{bidPrice_B}$$

The bidders are flagged if at least in two procedures they have the same ratio in their bid prices.

This indicator is included in Cardinal.

Source
Based on "Concerted bids" in A decision support system for fraud detection in public procurement and "Number of colluding partners with fixed difference bids" in Governance Risk Assessment System (GRAS) Advanced Data Analytics for Detecting Fraud, Corruption, and Collusion in Public Expenditures.

Unit of analysis   Bidder

R024 Price close to winning bid

Stage

| Planning | Tender | **Award** | Contract Implementation |

Type of red flag
Collusion risks

Definition

The percentage difference between the winning bid and the second-lowest valid bid is a low outlier.

Why is this a red flag?

A colluding bidder can mimic competition by submitting a bid that is similar in price (but different in quality, for example) from its colluding partner.

Required data fields

Data fields needed	OCDS fields
• Individual bid data and their amounts.	`bids/details/id, bids/details/value/amount, bids/details/value/currency,` `bids/details/status` To identify winning bid: `bids/details/tenderers/id` and `awards/suppliers/id` OR `awards/relatedBid` Optional, for greater accuracy: `award/status, tender/awardCriteria`

Methodology

1. For each contracting process, the *difference* is calculated as:

$$\frac{(secondLowestValidBidAmount - winningBidAmount)}{winningBidAmount}$$

2. A contracting process is flagged if the difference is less than or equal to the *lower fence* of Q_1-1.5(IQR) where Q_1 is the first quartile and IQR is the interquartile range for the set of differences.

3. The winner and second-lowest bidder are also flagged.

A contracting process is excluded if:
   • An award's status is pending or invalid.
   • The winning bid is not the lowest bid. (This indicator requires the award criteria to be price-only.)
   • There are multiple active awards (a.k.a. winning bids).
   • A bid is submitted by multiple tenderers
   • An award is made to multiple suppliers

This indicator is included in Cardinal.

Source

Based on "Difference between first and second relative offer prices" in Toolkit for detecting collusive bidding in public procurement and "Winning tender just below the next lowest bid" in Fraud in Public Procurement: A collection of Red Flags and Best Practices

Unit of analysis

Contracting Process   Bidder

R025 Excessive unsuccessful bids

Stage

| Planning | Tender | **Award** | Contract Implementation |

Type of red flag

Collusion risks

Definition

The ratio of winning bids to submitted bids for a top tenderer is a low outlier.
See also *R053 - Co-bidding pairs have same recurrent winner.*

Why is this a red flag?

A colluding bidder can mimic competition by submitting deliberately losing bids (at inflated bid prices, for example) in contracting processes in which a colluding partner participates.

Required data fields

Data fields needed	OCDS fields

• Tenderer (bidder) id (or name if ids are not available)
• Bid status
• Winning bidder id (supplier) or name if ids are not available
	`tender/tenderers/id` OR `bids/details/tenderers/id` OR `parties/id` where `parties/roles = tenderer`
	`bids/details/status`
	`awards/suppliers/id` OR `parties/id where parties/roles = supplier`

Methodology

1. For each tenderer, the ratio (or success rate) is calculated as $\dfrac{numberOfWinningBids}{numberOfValidBids}$ across all contracting processes.

2. A tenderer is flagged if:

    a. Its number of valid bids is greater than or equal to the *upper fence* of the third quartile (Q_3)) of the set of numbers of valid bids.

    b. Its ratio is less than or equal to the *lower fence* of Q_1-1.5(IQR) where Q_1 is the first quartile and IQR is the interquartile range for the set of ratios.

This indicator is included in Cardinal.

Source

Based on "Superfluous losing bidders" in Toolkit for detecting collusive bidding in public procurement *and "Top losers" in* A decision support system for fraud detection in public procurement

Unit of analysis   Bidder

R026 Prevalence of consortia

Stage

Planning | Tender | **Award** | Contract Implementation

Type of red flag

Collusion risks

Definition

The proportion of awards to a consortia is a high outlier in a market.

Why is this a red flag?

While consortia can be formed for legitimate reasons, joint bidding in a collusive setting can mitigate the burden of collusive behavior by formalizing the cooperation and facilitating rent sharing.

Required data fields

Data fields needed	OCDS fields

• Awarded supplier information
• Items information (to define the markets)
	`awards/suppliers/id,`
	`awards/suppliers/name,`
	`awards/status,awards/date,`
	`tender/items/classification/id,`
	`tender/items/classification/scheme`
	
	*award or contract items can be used instead

Methodology

A market m in period t is flagged if $\frac{Number\ of\ awards\ to\ a\ consortia_{mt}}{Number\ of\ awards_{mt}} > threshold$. Where the threshold can be defined as a value that is greater than or equal to the *upper fence* of $Q_3 + 1.5(IQR)$ where Q_3 is the third quartile and IQR is the interquartile range for the prevalence of consortia across markets.

Also this indicator could be calculated as:

$$Change\ in\ the\ prevalence\ of\ consortia_{mt} = \frac{Number\ of\ awards\ to\ a\ consortia_{mt}}{Number\ of\ awards_{mt}} - \frac{Number\ of\ awards\ to\ a\ consortia_{mt-1}}{Number\ of\ awards_{mt-1}}$$

A market is flagged if:

   a. The *change in the prevalence of consortia_{mt} > 0.*

The markets can be defined using the item classifications.

To identify consortia you can check if the award has multiple suppliers and it is not a framework agreement (e.g. has no related processes) .

Source

Based on "Prevalence of consortia" in Toolkit for detecting collusive bidding in public procurement, and Assessing the potential for detecting collusion in Swedish public procurement, "Two or more companies submit a joint bid, although they should be able to participate individually" in Fraud in Public Procurement: A collection of Red Flags and Best Practices.

Unit of analysis

Market

R027 Missing bidders

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag

Collusion risks

Definition

Potential bidders make agreements not to bid because of collusion arrangements.

Why is this a red flag?

Withholding bids from certain tenders is a straightforward way to restrict competition. Hence, the absence of bids from a a previously active company at a given market can indicate collusive bidding.

Required data fields

Data fields needed	OCDS fields

• Number of bidders
• Procurement method
• Items information (to define the markets)
• Tender date
	`tender/procurementMethod,`
	`tender/numberOfTenderers,` OR `tender/tenderers/id`
	OR `bids/details/tenderers/id,`
	`tender/items/classification/id,`
	`tender/items/classification/scheme,`
	`tender/tenderPeriod/startDate`
	
	*award or contract items can be used instead. Other variables to get the date could be used also.

Methodology

For each market m in period t where the $\frac{Number\ of\ bids_{mt}}{Number\ of\ tenders_{mt}} > 1$ (the threshold of 1 can be changed according to market characteristics):

$$R027_{mt}=1\ if\ \frac{Number\ of\ bids_{mt}}{Number\ of\ tenders_{mt}} < \frac{Number\ of\ bids_{mt-1}}{Number\ of\ tenders_{mt-1}}$$

Also this indicator could be calculated as:

$$Change\ in\ the\ average\ number\ of\ bids_{mt} = \frac{Number\ of\ bids_{mt}}{Number\ of\ tenders_{mt}} - \frac{Number\ of\ bids_{mt-1}}{Number\ of\ tenders_{mt-1}}$$

A market is flagged if:

    a. The *change in the average number of bids $_{mt}$* is lower than or equal to the *lower fence* of the first quartile (Q_1) of the *change in the average number of bids* for all markets.

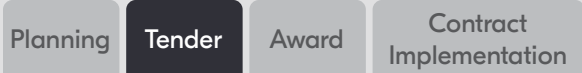The markets can be defined using the item classifications.

Source

Based on "Missing bidders MB2" in <u>Toolkit for detecting collusive bidding in public procurement,</u> and <u>Assessing the potential for detecting collusion in Swedish public procurement</u>

Unit of analysis

Market

Stage

Planning	**Tender**	Award	Contract Implementation

Type of red flag

Collusion risks

Definition

Different tenderers submitted bids with the same price.

Why is this a red flag?

A corrupt buyer can award the pre-determined bidder by leaking competitors' prices. Also, collusive bidders can agree on the price to submit.

Required data fields

Data fields needed	OCDS fields

• Bid status
• Bid values
	`bids/details/id,`
	`bids/details/status,`
	`bids/details/value/amount,`
	`bids/details/value/currency,`
	`bids/details/tenderers/id`

Methodology

A contracting process is flagged if different tenderers submitted bids with the same price.

These tenderers are also flagged.

For bidders k and j bidding in the same procedure, the procedure is flagged if the bidders submit identical bid prices:

$$R028_i = 1 \ if \ bids/details/value/amount_{k,i} \ = \ bids/details/value/amount_{j,i}$$

This indicator is included in Cardinal.

Source

Based on "Bidders having the same bid price" in Assessing the potential for detecting collusion in Swedish public procurement and "Different companies include identical unit prices in their bid documents" in Fraud in Public Procurement: A collection of Red Flags and Best Practices.

Unit of analysis

Contracting Process   Bidder

R029 Bid prices deviate from Benford's Law

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Bid-rigging

Definition

The distribution of bid prices (or tender or contract values) in a specific market deviates from Benford's Law distribution. The indicator can also be calculated for the whole procurement dataset, however it could be less informative.

Why is this a red flag?

Benford's law states that the first digit of most naturally occurring sets of numerical data follows a particular pattern, where the number 1 appears as the leading digit about 30% of the time, the number 2 as the the leading digit about 17% of the time, and so on up to 9, which should appear as a leading digit about 4% of the time. A deviation from this pattern could be a sign of price manipulation.

Required data fields

Data fields needed	OCDS fields
• Bid values • Items information (to define the markets) Alternative: • Tender values or contract values	`bids/details/value/amount` AND `bids/details/value/currency` OR `tender/value/amount` AND `tender/value/currency` OR `contracts/value/amount` AND `contracts/value/currency` OR `awards/value/amount` and `awards/value/currency`, `tender/items/classification/id`, `tender/items/classification/scheme`

Methodology

A market m is flagged if the bid price (or tender or contract value) distribution of the first digits for period t deviates from Benford's law, and the difference is statistically significant.

This indicator requires high data quality (e.g. a lot of missing values could bias the results).

Source

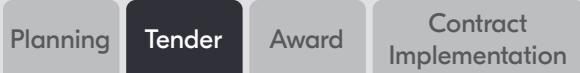*Based on "Benford's Law" in Assessing the potential for detecting collusion in Swedish public procurement, ProACT Integrity indicators and Public procurement in Brazil: Evidence of frauds using the Newcomb-Benford Law, and "Unusual contract value" in Governance Risk Assessment System (GRAS) Advanced Data Analytics for Detecting Fraud, Corruption, and Collusion in Public Expenditures.*

Unit of analysis

Market

R030 Late bid won

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Bid-rigging

Definition
The winning bid was received after the submission deadline.

Why is this a red flag?
A corrupt buyer can award the predetermined bidder by disregarding the submission deadline.

Required data fields

Data fields needed	OCDS fields

• Bid submission date
• Bid status
• Tender period end date
	`tender/tenderPeriod/endDate,`
	`bids/details/id`
	`bids/details/date,`
	`bids/details/status,`
	To identify winning bid:
	`bids/details/tenderers/id` and `awards/suppliers/id`
	OR `awards/relatedBid`

Methodology

For each procedure *i where bids/details/status = valid*

A contracting process is flagged if:

$bids/details/date_i > tender/tenderPeriod/endDate_i$

- A valid bid's received date is after the submission deadline.
- At least one tenderer of the valid bid is the supplier of an active award.

These tenderers are also flagged.

This indicator is included in Cardinal.

Source

Based on "Bids after the deadline accepted" in Corruption in Public Procurement: Finding the Right Indicators and "Late submissions accepted" in Fraud in Public Procurement: A collection of Red Flags and Best Practices

Unit of analysis

Contracting Process   Bidder

R031 Winning bid price very close or higher than estimated price

Stage

Planning | Tender | **Award** | Contract Implementation

Type of red flag

Bid-rigging

Definition

The ratio between the winning bid and the estimated price is a high outlier.

Why is this a red flag?

Bid prices are expected to fall below the estimated price, due to healthy competition, assuming the estimated price is not unbiased. "A winning bid that is too close to confidential project cost estimates or budgets can indicate the leaking of bid information or an unbalanced bidding scheme" ([IACRC](#)).

Required data fields

Data fields needed	OCDS fields

• Bid amount
• Bid status
• Winning bidder
• Tender amount
	`bids/details/id`
	`bids/details/status,`
	`bids/details/value/amount,`
	`bids/details/value/currency`
	`tender/value/amount,`
	`tender/value/currency`
	To identify winning bid:
	`bids/details/tenderers/id` and `awards/suppliers/id`
	OR `awards/relatedBid`

Methodology

For each contracting process in market m the ratio is calculated as:

$$Relative\ contract\ value_m = \frac{winning\ bid\ price_m}{estimated\ tender\ price_m}$$

A contracting process is flagged if its $Relative\ contract\ value_m$ is greater than or equal to the $upper\ fence$ of $Q_3 + 1.5(IQR)$ where Q_3 is the third quartile and IQR is the interquartile range for the set of ratios for market m.

The market can be defined using the item classifications. Alternatively the indicator can be calculated for the whole dataset.

Source

Based on "Relative contract value" in [Toolkit for detecting collusive bidding in public procurement](#) and "Contract share with very high relative contract value" in [Governance Risk Assessment System (GRAS) Advanced Data Analytics for Detecting Fraud, Corruption, and Collusion in Public Expenditures.](#)

Unit of analysis

Contracting Process

R032 Bidders share same beneficial owner

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag

Collusion risks

Definition

Two tenderers bidding in the same contracting process share the same beneficial owner.

Why is this a red flag?

While shared ownership of bidders participating in the same contracting process is often not illegal, shared ownership could be a sign of collusion or coordinated companies submitting bids to simulate competition.

Required data fields

Data fields needed	OCDS fields
• Bidder beneficial ownership information	`parties/roles` IN 'supplier' OR 'tenderer', `parties/id`, `parties/beneficialOwners/name`, `parties/beneficialOwners/id` See Beneficial ownership extension

Methodology

Tenderers a and b are flagged if they participate in the same contracting process i and:

$$Beneficial\ owners_{a,i} = Beneficial\ owners_{b,i}$$

Where at least they share 1 beneficial owner.

A contracting process is flagged if it has flagged bidders.

Source

Based on "Common partners" in A decision support system for fraud detection in public procurement and "Detecting shared ownership" in Beneficial ownership data in procurement.

Unit of analysis

Contracting Process   Bidder

R033 Bidders share same major shareholder

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Collusion risks

Definition
Two tenderers bidding in the same contracting process share the same major shareholder.

Why is this a red flag?
Sharing the same major shareholder could indicate that the companies belong to the same economic group, thus competition is impaired and this could be a sign of collusion.

Required data fields

Data fields needed	OCDS fields
• Bidder shareholder information	`parties/roles` IN 'tenderer', `parties/id`, `parties/shareholders/shareholder/id`, `parties/shareholders/shareholding`

Methodology

Tenderers a and b are flagged if they participate in the same contracting process i and:

$$Major\ shareholder_{a,i} = Major\ shareholder_{b,i}$$

A contracting process is flagged if it has flagged bidders.

Source

Based on "Common economic group" in *A decision support system for fraud detection in public procurement* and "Common shareholder" in *Governance Risk Assessment System (GRAS) Advanced Data Analytics for Detecting Fraud, Corruption, and Collusion in Public Expenditures.*

Unit of analysis

Contracting Process   Bidder

R034 Bids submitted in same order

Stage

Planning | **Tender** | Award | Contract Implementation

Type of red flag
Collusion risks

Definition

Sequence of bid submissions shows patterns in different bid rounds.

Why is this a red flag?

Certain bidding patterns and practices seem at odds with a competitive market and suggest the possibility of collusion. Two bidders submitting bids in the same order at different stages of the tendering process might indicate they are coordinating the submission.

Required data fields

Data fields needed	OCDS fields
• Bidder details • Bids date • Bid status	bids/details/id, bids/details/date, bids/details/tenderers/id, bids/details/tenderers/name, bids/details/status

Methodology

A contracting process is flagged, if different bidders submit valid bids in the same order in different bid rounds. The bidders are also flagged.

Example, for a contracting process i, bidders A and B are flagged:

Bidder	Order in round 1	Order in round 2
A	1	1
B	2	2
C	3	4
D	4	3

Source

Based on "Bidding red flags" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects

Unit of analysis

Contracting Process

R035 All except winning bid disqualified

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag

Bid-rigging

Definition

Bids are disqualified if not submitted by the single tenderer of the winning bid.

Why is this a red flag?

A corrupt buyer can award the predetermined bidder by disqualifying other bidders' bids.

Required data fields

Data fields needed	OCDS fields

• Information on the submitted bids including the status, id, and winning bidder.
• Award status
	`bids/details/id`
	`bids/details/status,`
	To identify winning bid:
	`bids/details/tenderers/id` and `awards/suppliers/id`
	OR `awards/relatedBid`
	`awards/status`

Methodology

A contracting process i is flagged if:

- Exactly one tenderer (*bids/details/tenderers/id*) submitted one or more bids that are valid (i.e. qualified) (*bids/details/status = valid*)

- The tenderer of the valid bids and the suppliers of all active awards are the same.

  bids/details/tenderers/id = awards/suppliers/id

- At least 1 other tenderer submitted a bid that was disqualified.

The winner is also flagged.

This indicator is included in Cardinal.

Example

Italy's Anticorruption agency ANAC incorporates this indicator in their red flags dashboard (see IND. 11).

Source

Based on "Exclusion of all but one bid" in An Objective Corruption Risk Index Using Public Procurement Data and "Prevalence of faulty bids" in Toolkit for detecting collusive bidding in public procurement.

Unit of analysis

Contracting Process   Bidder

R036 Lowest bid disqualified

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Bid-rigging

Definition

The lowest submitted bid is disqualified, while the award criterion is price only.

Why is this a red flag?

A corrupt buyer can award the predetermined bidder by disqualifying lower-priced bids.

Required data fields

Data fields needed	OCDS fields

• Bid id
• Bid status
• Bid amounts
• Award criteria
	`bids/details/id`
	`bids/details/status,`
	`bids/details/value/amount,`
	`bids/details/value/currency,`
	`tender/awardCriteria`

Methodology

For each procedure i that has one or more active awards:

1. If *tender/awardCriteria*, filter procedures where *tender/awardCriteria = priceOnly*. If not, calculate this for all tenders with awards.

2. Select procedures where there are one or more valid bids with amounts.

3. Flag the procedure i if the lowest bid submitted *MIN*(*bids/details/value/amount*) is disqualified *bids/details/status= disqualified*

This indicator is included in Cardinal.

Source

Based on "The lowest bid is rejected almost inexplicably" in Fraud in Public Procurement: A collection of Red Flags and Best Practices, "Lowest bidder not selected" in Common Red Flags of Fraud and Corruption in Procurement, and "Award to other than lowest qualified bidder" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects

Unit of analysis

Contracting Process

R037 Poorly supported disqualifications

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Bid-rigging

Definition
An apparent qualified contractor was disqualified.

Why is this a red flag?
Project officials can disqualify bidders at the prequalification or bidding stages for superficial or arbitrary reasons in order to facilitate the selection of a favored bidder.

Required data fields

Data fields needed	OCDS fields

• Award criteria
• Bid status
• Bidders details
• Evaluation reports
	`tender/awardCriteria,`
	`bids/details/id,`
	`bids/details/value/amount,`
	`bids/details/value/currency,`
	`bids/details/status,`
	`bids/details/documents = evaluationReports`

Methodology
A contracting process is flagged if the reasons for disqualification do not align with the award criteria and seem unjustified.

Source
Based on "Excluding qualified bidders" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects

Unit of analysis
Contracting Process

R038 Excessive disqualified bids

Stage

Planning | **Tender** | Award | Contract Implementation

Type of red flag
Bid-rigging

Definition

The ratio of disqualified bids to submitted bids is a high outlier per buyer, procuring entity or tenderer.

Why is this a red flag?

A corrupt buyer or procuring entity can award pre-determined bidders by disqualifying other bidders' bids.

A colluding bidder can mimic competition by submitting deliberately unqualified bids.

Required data fields

Data fields needed	OCDS fields

• Information on the bid status, id.
• Bidder id
• Buyer or procuring entity id or name.
	`bids/details/id`
	`bids/details/status,`
	`(bids/details/tenderers/id` OR `parties/id` with `parties/roles=tenderer),`
	`(tender/procuringEntity/id` OR `buyer/name` OR `parties/id` with `parties/roles=buyer)`

Methodology

1. For each buyer, the ratio is calculated as: $\dfrac{numberOfBidsDisqualifiedByBuyer}{numberOfBidsSubmittedToBuyer}$

A buyer is flagged if its ratio is greater than or equal to the *upper fence* of Q_3 + 1.5(IQR) where Q_3 is the third quartile and IQR is the interquartile range for the set of ratios.

For each procuring entity, the *ratio* is calculated the same as for buyers.

2. For each tenderer, the *ratio* is calculated across all contracting processes as: $\dfrac{numberOfBidsDisqualifiedForTenderer}{numberOfBidsSubmittedForTenderer}$

A tenderer is flagged if its ratio is greater than or equal to the *upper fence* of Q_3 + 1.5(IQR) where Q_3 is the third quartile and IQR is the interquartile range for the set of ratios.

This indicator is included in Cardinal.

Example

Italy's Anticorruption agency ANAC calculates a similar indicator in their red flags dashboard (see IND. 10).

Source

Based on "Excluding qualified bidders" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects, Behind the Scenes of ProZorro: Does Ukrainian business trust public procurement?

Unit of analysis

Bidder | Buyer

R039 Unanswered bidder questions

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Low transparency

Definition
Bidder enquiries are not answered.

Why is this a red flag?
If questions are left unanswered this can signal that a procuring entity is trying to exclude particular suppliers or favor a particular firm.

Required data fields

Data fields needed	OCDS fields

• Tender status
• Tender enquiries
• Enquiries answers
	`tender/enquiries/date,`
	`tender/enquiries/dateAnswered,`
	`tender/enquiries/answer,`
	`tender/status`
	
	See Enquiries extension

Methodology
A contracting process is flagged if the status is complete and it has enquiries without answers.

Source
Based on "Precautionary measures in tendering" in OECD's Principles for Integrity in Public Procurement
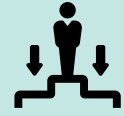
Unit of analysis   Contracting Process

R040 High share of buyer's contracts

Stage

Planning | Tender | **Award** | Contract Implementation

Type of red flag

Low competition

Definition

The bidders share of a buyer's contracts is a high outlier.

See also *R050 - High market share, R051 - High market concentration.*

Why is this a red flag?

A corrupt buyer can consistently award contracts to the preferred bidder.

Required data fields

Data fields needed	OCDS fields
• Supplier name • Award status • Procuring entity or buyer name • Award date	`awards/suppliers/id, awards/suppliers/name, tender/procuringEntity/name` OR `buyer/name` OR OR `parties/id` AND `parties/roles=buyer or procuringEntity, awards/status, awards/date`

Methodology

1. Calculate the share (S) of contracts awarded to the supplier for buyer b in period t:

$$S_{k,b,t} = \frac{\sum_{i=1}^{n} award\ value_{k,b,t}}{\sum_{i=1}^{n} award\ value_{b,t}}$$

2. A supplier is flagged if its market share $S > threshold\ value$ (e.g. 40%). The buyer is also flagged. Also the threshold can be defined as a value that is greater than or equal to the *upper fence* of Q_3 + 1.5(IQR) where Q_3 is the third quartile and IQR is the interquartile range for the set of suppliers shares across buyers.

Source

Based on "Winner's share of issuer's contracts" in <u>Anatomy of grand corruption: A composite corruption risk index based on objective data</u>

Unit of analysis

Bidder | Buyer

R041 Physical similarities in documents by different bidders

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag

Collusion risks

Definition

Two tenderers bidding in the same contracting process submit documents with similar information or format.

Why is this a red flag?

Similarities in the submitted bidding documents can indicate that the bidders are connected and that the same person prepared all the bids.

Required data fields

Data fields needed	OCDS fields

• Bidder information
• Bidder documents
	`bids/documents/documentType='biddingDocuments',`
	`bids/details/id,`
	`bids/details/tenderers/id`

Methodology

Tenderers a and b are flagged if they participate in the same contracting process i and:

Document details $_{a,i}$ =*Document details* $_{b,i}$

Where the document details can refer to similar descriptions, titles, structure, the same handwriting, postmarks, misspellings.

A contracting process i is flagged if it has flagged bidders.

Source

Based on "Analysis of the submitted documentation" in Guidelines for detecting bid rigging in public procurement and OECD Guidelines for fighting bid rigging in public procurement, "Red flags with regard to bid documents" in Fraud in Public Procurement: A collection of Red Flags and Best Practices.

Unit of analysis   Contracting Process   Bidder

R042 Bidder has abnormal address or phone number

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Fraud

Definition
Bidder phone number or address is atypical.

Why is this a red flag?
This can indicate the supplier is a fictitious company or is providing false information. In some collusive bidding cases, the winning bidder prepares and submits losing bids from non-existent companies to give the appearance of competition.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Bidder phone number OR • Bidder address	`parties/roles`` IN 'supplier' OR 'tenderer', parties/id (parties/contactPoint/ telephone OR parties/address/ streetAddress OR parties/address/ postalCode)`	National phone number and address format.

Methodology

A tenderer is flagged if:

$$len(parties/contactPoint/telephone) \neq len(valid\ phone\ number)$$

Note: Depending on the context other rules can be used, for instance if telephone numbers must start with a specific number, or if postal codes have a specific format.

A contracting process is flagged if it has a flagged bidder.

Source

Based in "Suspicious bidders" in <u>Warning signs of Fraud and Corruption in Public procurement</u>. and Fictitious Contractor in <u>Guide to Combating Corruption & Fraud in Infrastructure Development Projects</u>, "Common addresses" in <u>A decision support system for fraud detection in public procurement</u>

Unit of analysis

Contracting Process   Bidder

R043 Bidder has same contact information as project official

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Bid-rigging

Definition

Bidder contact information matches buyer's contact point information.

Why is this a red flag?

This can indicate the supplier is a fictitious company or is providing false information. In some collusive bidding cases, the winning bidder prepares and submits losing bids from non-existent companies to give the appearance of competition.

Required data fields

Data fields needed	OCDS fields

• Bidder contact details
• Project official (buyer)
• contact details
	`parties/roles,`
	`parties/id,`
	`parties/contactPoint/telephone,`
	`parties/contactPoint/name,`
	`parties/contactPoint/email`

Methodology

A bidder is flagged if they share the same contact information as the project official.

bidder contact point $_{a,i}$ = procuring entity contact point $_i$

A contracting process i is flagged if it has flagged bidders.

Source

Based on "Contractor's address or phone number matches project official's" in <u>*Guide to Combating Corruption & Fraud in Infrastructure Development Projects*</u>

Unit of analysis

Contracting Process   Bidder

R044 Business similarities between bidders

Stage

Planning | **Tender** | Award | Contract Implementation

Type of red flag

Collusion risks

Definition

Two tenderers bidding in the same contracting process share similar business information.

Why is this a red flag?

Similarities between suppliers may indicate that the companies are connected.

Required data fields

Data fields needed	OCDS fields
• Bidder phone number, address, contact point or email.	`parties/roles`` IN 'supplier' OR 'tenderer', parties/id (parties/contactPoint/telephone OR parties/address/streetAddress OR parties/address/postalCode OR parties/contactPoint/email`

Methodology

Tenderers a and b are flagged if they participate in the same contracting process i and:

$$Business\ details_{a,i} = Business\ details_{b,i}$$

Where business details could be the phone number, contact point, email address, street address.

A contracting process is flagged if it has flagged bidders.

Source

Based on "Connections between bidders" in Corruption in Public Procurement: Finding the Right Indicators and "Similarity in Bids" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects

Unit of analysis

Contracting Process | Bidder

R045 Bidder is not listed in business registries

Stage

Planning	**Tender**	Award	Contract Implementation

Type of red flag
Fraud ⚠️

Definition
Bidder does not appear in the supplier registry.

Why is this a red flag?
If the supplier or bidder is not traceable in official registries, this can indicate that it is a fictitious company or it is providing false information.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Bidder id and name	`parties/roles` IN 'supplier' OR 'tenderer', `parties/id`	Business registry database. Verify if in the local regulations only registered bidders can bid on a contract.

Methodology

This indicator can only be calculated when tenderers are required to be registered as a business or be registered in the official supplier registry to bid on a tender.

A tenderer is flagged if the tenderer is not in the supplier registry.

A contracting process is flagged if it has flagged bidders.

Source

Based on "Fictitious contractor" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects and "Suspicious bidders" in Warning signs of Fraud and Corruption in Public procurement.

Unit of analysis

Contracting Process   Bidder

R046 Bidder is debarred or on sanctions list

Stage

| Planning | **Tender** | Award | Contract Implementation |

Type of red flag
Fraud

Definition
Bidder appears on an official sanctions or debarments list.

Why is this a red flag?
Previously sanctioned suppliers can pose a higher risk.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Bidder id and name	`parties/roles` IN `'supplier'` OR `'tenderer'`, `'parties/id'`	Debarred or sanctioned suppliers list.

Methodology

A tenderer is flagged if the tenderer appears in the sanctions or debarment list.

A contracting process is flagged if it has flagged bidders.

Source

Based on "Blacklisting" in A decision support system for fraud detection in public procurement and "Sanctioned company" in Governance Risk Assessment System (GRAS) Advanced Data Analytics for Detecting Fraud, Corruption, and Collusion in Public Expenditures.

Unit of analysis

Contracting Process   Bidder

R047 Supplier is not traceable on the web

Stage

| Planning | Tender | **Award** | Contract Implementation |

Type of red flag
Fraud ⚠️

Definition

Supplier is not traceable through web search

Why is this a red flag?

If the supplier or bidder is not traceable online, this can indicate that it is a fictitious company or it is providing false information. "A project or government official can create a fictitious contractor, consultant, vendor or supplier that does not provide any actual goods or services in order to embezzle project funds" (IACRC).

Required data fields

Data fields needed	OCDS fields
• Supplier id and name • Supplier website	parties/roles= 'supplier', parties/id, parties/name OR awards/suppliers/name, awards/suppliers/id, parties/contactPoint/url

Methodology

A supplier is flagged if the URL provided is not active or invalid.

Note: This red flag may only be relevant in contexts where there is a high internet use and suppliers are expected to have websites.

A contracting process is flagged if it has a flagged supplier.

Source

Based on "Fictitious contractor" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects

Unit of analysis   Contracting Process   Bidder

R048 Heterogeneous supplier

Stage

Planning | Tender | **Award** | Contract Implementation

Definition

The variety of items supplied by a tenderer is a high outlier.

Type of red flag

Fraud ⚠️

Why is this a red flag?

A heterogeneous supplier is more likely to be unsuitable, increasing the risk of low value for money, low quality of delivery, and/or rent extraction.

Required data fields

Data fields needed	OCDS fields
• Item classification id and scheme	awards/items/classification/id, awards/items/classification/scheme, awards/suppliers/id, awards/suppliers/name *contracts or tender items can be used instead

Methodology

This indicator requires awarded items to be classified using a hierarchy of numeric codes. For example, UNSPSC and CPV have four primary levels.

UNSPSC

Digits	Level
XX000000	Segment
XXXX0000	Family
XXXXXX00	Class
XXXXXXXX	Commodity

For each tenderer, the *variety* is calculated as the number of distinct first-level classifications across all items awarded to the tenderer, across all contracting processes. A tenderer is flagged if its variety is greater than or equal to the *upper fence* of $Q_3 + 1.5(IQR)$ where

CPV

Digits	Level
XX000000	Division
XXX00000	Group
XXXX0000	Class
XXXXX000	Category

Q_3 is the third quartile and IQR is the interquartile range for the set of varieties among tenderers awarded in at least X contracting processes, where X can be selected by the user based on the context (e.g 20).

This indicator is included in Cardinal.

Source

Based on "Component C1B" in Design and measurement of a corruption risk index from a supplier perspective in the context of COVID-19 emergency.

Unit of analysis   Bidder

R049 Direct awards below threshold

Stage

| Planning | Tender | **Award** | Contract Implementation |

Type of red flag

Bid-rigging

Definition

Supplier receives more than 1 direct award from the same buyer in period t just below the competitive threshold.

See also *R011 - Splitting purchases to avoid procurement thresholds, R055 - Multiple direct awards above or just below competitive threshold.*

Why is this a red flag?

Multiple contract awards to the same company that are clustered just below a procurement threshold is a strong indicator of possible corruption.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Procurement method • Supplier name • Award date • Buyer or procuring entity name	tender/procurementMethod, awards/suppliers/id, awards/suppliers/name, awards/date, tender/procuringEntity/name OR buyer/name OR parties/id and parties/name with parties/roles=buyer	Competitive procurement thresholds as stated by the local regulations.

Methodology

A supplier k is flagged if it has won more than 1 direct award in procuring entity j in period t, just below threshold value.

The time period and the distance to the threshold value (e.g. 1%, 2%) can be defined based on the context.

Source

Based on "Multiple Awards just under procurement thresholds" in Guide to Combating Corruption & Fraud in Infrastructure Development Projects.
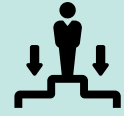
Unit of analysis

Bidder

R050 High market share

Stage

Planning | Tender | **Award** | Contract Implementation

Type of red flag

Low competition

Definition

A supplier wins a high share of contracts in a particular market from the same buyer.

Why is this a red flag?

This indicator can be considered a corruption outcome, since the ultimate goal of institutionalized corruption is to award contracts repeatedly to the same company or group of companies.

Required data fields

Data fields needed	OCDS fields

• Supplier name
• Award status
• Award amount
• Award date
• Procuring entity or buyer name
• Award items to identify markets
	`awards/suppliers/id, awards/suppliers/name, tender/procuringEntity/name` OR `buyer/name` OR OR `parties/id` AND `parties/roles=buyer or procuringEntity,`
	`awards/value/amount, awards/value/currency, awards/status,`
	`awards/date`
	
	Optional: `awards/items/classification/id, awards/items/classification/scheme` or tender or contract items, to compare awards in the same item category.

Methodology

1. Calculate the market share (S) of each supplier k in market m for buyer b in period t:

$$S_{m,b,k,t} = \frac{\sum_{i=1}^{n} award\ value_{k,m,t}}{\sum_{i=1}^{n} award\ value_{m,t}}$$

2. A supplier is flagged if its market share $S >$ *threshold value* (e.g. 40%). The buyer is also flagged.

Source

Based on "Winner's share of issuer's contracts" in <u>Anatomy of grand corruption: A composite corruption risk index based on objective data</u>
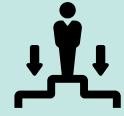
Unit of analysis

Bidder | Buyer

R051 High market concentration

Stage

Planning | Tender | **Award** | Contract Implementation

Type of red flag

Low competition

Definition

A small number of companies win a high share of contracts in a particular market.

Why is this a red flag?

A high market concentration can be a result of collusive bidding or low competition.

Required data fields

Data fields needed	OCDS fields
• Supplier id or name • Item classification (to identify the markets). • Award or contract values • Award date	awards/suppliers/id, awards/suppliers/name, awards/value/amount, awards/value/currency, awards/date, awards/status, awards/items/classification/id, awards/items/classification/scheme *Contract of tender items could be used instead, and contract values can be used instead of award values if available.

Methodology

1. Define the markets of interest using the item classifications. Other market definitions could be used depending on the availability of data (for instance, selecting markets based on geographical location)

2. Calculate the market share (S) of each supplier k in market m in period t:

$$S_{m,k,t} = \frac{\sum_{i=1}^{n} award\ value_{k,m,t}}{\sum_{i=1}^{n} award\ value_{m,t}}$$

3. Calculate the Hirschman-Herfindahl Index (HHI) for each market:

$$HHI_{m,t} = \sum_{i=1}^{n} S^2_{k,m,t}$$

4. A market is flagged if $HHI_{m,t} > 1800$

   Also a market can be flagged if there is an increase in the HHI index between periods: $HHI_{m,t} > HHI_{m,t-1}$

According to the US Department of Justice Antitrust guidelines, a market is considered to be moderately concentrated if its HHI is between 1000 and 1800 points, and highly concentrated if its HHI is above 1800 points. A change in HHI of 200 points between periods is considered a significant increase.

Example

The C.O.R.E project dashboard calculates a similar indicator in the context of emergencies, to analyze if contracting authorities award most of their contracts to a restricted group of companies.

Source

Based on "Concentrated market structure" in Toolkit for detecting collusive bidding in public procurement and Merger Guidelines U.S. Department of Justice and the Federal Trade Commission Markets.

Unit of analysis

Market

R052 Small initial purchase from supplier followed by much larger purchases

Stage

Planning | Tender | **Award** | Contract Implementation

Type of red flag

Bid-rigging

Definition

The supplier receives two contracts over a distinct time period, the first in a small amount, the second in a larger amount, from the same buyer.

Why is this a red flag?

This red flag could indicate that project officials are trying to favor a fictitious contractor. A fictitious or fraudulent contractor could start with a small purchase to test whether it is accepted by the procuring entity and then bid for a larger contract.

Required data fields

Data fields needed	OCDS fields
• Supplier name • Award status • Award amount • Award date • Procuring entity or buyer name	`awards/suppliers/id, awards/suppliers/name, tender/procuringEntity/name` OR `buyer/name, awards/value/amount, awards/value/currency, awards/status, awards/date` Optional: `awards/items/classification/id, awards/items/classification/scheme` or tender or contract items, to compare awards in the same item category.

Methodology

For each contracting process where *awards/status* = '*active*', and for supplier m that has won more than 1 award in period t from buyer j calculate the difference between the first and second award:

$$difference_{m,j} = \frac{(awards/value/amount_t - awards/value/amount_{t-1})}{awards/value/amount_{t-1}}$$

$$R052_i = 1 \; if \; difference > threshold \; value$$

A contracting process is flagged if *difference* > *threshold value*, where the *threshold value* can be defined by the user (e.g. 30%) or calculated as the *upper fence* of Q_3+1.5(IQR_j) where Q_3 is the third quartile and *IQR* is the interquartile range for the set of differences in all contracting procedures.

The supplier m is also flagged.

Source

Based on "Fictitious contractor" in Guide to Combating Corruption & Fraud in Development Projects.

Unit of analysis

Contracting Process | Bidder

R053 Co-bidding pairs have same recurrent winner

Stage

| Planning | Tender | **Award** | Contract Implementation |

Type of red flag

Collusion risks

Definition

Two bidders co-bid in 2 or more tenders, but only one bidder wins.

See also *R025 - Excessive unsuccessful bids.*

Why is this a red flag?

Coordinated bidding behavior can be a signal of collusion. For instance, a colluding bidder can mimic competition by submitting deliberately losing bids in contracting processes in which a colluding partner participates.

Required data fields

Data fields needed	OCDS fields
• Winning bidder • Bid status • Bidder details	bids/details/id,bids/details/status, bids/details/tenderers/id AND awards/suppliers/id OR (awards/relatedBid), awards/status OR parties/id where parties/roles = supplier

Methodology

A pair of bidders A and B is flagged if:

1. They have co-bidded in 2 or more contracting processes (a higher threshold can be defined to include bidders with a higher frequency).

2. The winning bidder is always the same.

The contracting processes are also flagged.

Note: See sources below for other approaches to use network metrics to detect suspicious co-bidding patterns.

Source

Based on Corruption and the Network Structure of Public Contracting Markets across Government Change, "Superfluous losing bidders" in Toolkit for detecting collusive bidding in public procurement

Unit of analysis

Contracting Process   Bidder

R054 Direct award followed by change orders that exceed the competitive threshold

Stage

Planning	Tender	**Award**	Contract Implementation

Type of red flag

Bid-rigging

Definition

A direct award is followed by contract modifications in its value that exceed the competitive threshold.

Why is this a red flag?

Once the contract is signed, amendments or change orders can be made. While there are cases where this can be legitimate, change orders can be manipulated to facilitate corruption or fraud, for instance, through an unjustified increase in the price, by including other items in the contracts, extending the timeline, etc. Evidence shows that thresholds can be manipulated to initially avoid more competitive procedures, and once the contract has been awarded change orders can be used to increase prices above threshold.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Procurement method • Contract status • Contract amounts • Contract amendments description	tender/procurementMethod, tender/procurementDetails (to verify the competitive thresholds), contracts/status, awards/value/amount, awards/value/currency, contracts/value/amount, contracts/value/currency, contracts/amendments/description (see for changes in total value)	Competitive threshold in local regulations.

Methodology

For procedures where the *tender/procurementMethod* = '*direct*' and the contract has amendments. A contracting process is flagged if:

The *contracts/value/amount* > *threshold for competitive procedures*.

You can review the *contracts/amendments/description* to identify if the amendments resulted in a price increase. You can also compare the award value to the contract value to see if the values changed.

The winning supplier is also flagged.

Source

Based on Questionable Contract Amendments in Guide to Combating Corruption & Fraud in Development Projects.

Unit of analysis

Contracting Process   Bidder

R055 Multiple direct awards above or just below competitive threshold

Stage

| Planning | Tender | **Award** | Contract Implementation |

Type of red flag
Bid-rigging

Definition

Supplier receives multiple direct awards from the same buyer in period t that surpasses the competitive threshold.

See also *R011 - Splitting purchases to avoid procurement thresholds and R002 - Manipulation of procurement thresholds.*

Why is this a red flag?

Public officials can have significantly higher levels of discretion awarding contracts when estimated costs are below competitive thresholds. If the same supplier receives multiple direct awards from the same buyer below threshold this could be a sign of contract splitting.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Procurement method • Buyer identifier • Awards amount • Award status • Procedure date	`tender/procurementMethod,` `awards/suppliers/id` (or `awards/suppliers/name`), `buyer/name` (or `tender/procuringEntity/name`), `awards/date,` `awards/value/amount, awards/value/currency`	Competitive threshold in local regulations.

Methodology

For each supplier k that has won more than 1 direct award from procuring entity j in period t, calculate the sum of all the direct awards. A buyer j is flagged if:

$$\sum_{i}^{n} \text{direct awards amount}_{k,t,j} > \text{competitive threshold}$$

The bidder is also flagged.

This indicator is included in Cardinal.

Source

Based on "Multiple Awards just under procurement thresholds" in *Guide to Combating Corruption & Fraud in Development Projects.*

Unit of analysis

Bidder   Buyer

R056 Winning bid does not meet the award criteria

Stage

| Planning | Tender | **Award** | Contract Implementation |

Type of red flag
Bid-rigging

Definition

The winning bid does not meet the award criteria.

Why is this a red flag?

In a poorly controlled bidding process, project officials can tamper with bids after receipt to ensure that a favored contractor is selected (IACRC, 2012).

Required data fields

Data fields needed	OCDS fields

• Award criteria
• Winning bid details
• Evaluation reports
	`tender/awardCriteria, bids/details/status, bids/details/documents = evaluationReports`
	
	To identify winning bid:
	`bids/details/tenderers/id` and `awards/suppliers/id`
	OR `awards/relatedBid`

Methodology

A contracting process *i* is flagged if it does not meet the award criteria based on the evaluation reports.

Source

Based on Manipulation of Bids in Guide to Combating Corruption & Fraud in Development Projects.

Unit of analysis   Contracting Process

R057 Bid rotation

Stage

| Planning | Tender | **Award** | Contract Implementation |

Type of red flag
Collusion risks

Definition
Bidders take turns in being the winner.

Why is this a red flag?
Members of a collusive bidding scheme can agree to rig the bidding process in order to allow each member of the group to win a contract at an inflated price on a rotating basis.

Required data fields

Data fields needed	OCDS fields
• Bidders details • Bis status • Winning bidder • Bid values • Item classification (to define markets)	bids/details/tenderers/id, bids/details/tenderers/name, awards/suppliers/id, awards/suppliers/name, bids/details/value/amount, bids/details/value/currency, awards/items/classification/id AND awards/items/classification/scheme Tender or contract items could be used instead

Methodology

A group of bidders in market m is flagged if, in the analyzed period t, each firm wins the same number of contracts and for a similar amount.

See other empirical applications to detect bid rotation in the sources.

Source

Based on "Bid rotation" in Empirical Methods for Detecting Bid-rigging Cartels, Guidelines for detecting bid rigging in public procurement, Using Bid Rotation and Incumbency to Detect Collusion: A Regression Discontinuity Approach

Unit of analysis   Bidder   Market

R058 Heavily discounted bid

Stage

| Planning | Tender | **Award** | Contract Implementation |

Type of red flag

Collusion risks

Definition

The percentage difference between the winning bid and the second-lowest valid bid is a high outlier.

Why is this a red flag?

An unethical bidder can offer defective goods ("lemons") if the buyer has inadequate quality criteria.

Required data fields

Data fields needed	OCDS fields

• Bid id
• Bid status
• Bid values
• Winning bidder
	`bids/details/id,`
	`bids/details/value/amount, bids/`
	`details/value/currency, bids/details/`
	`status,`
	To identify winning bid:
	`bids/details/tenderers/id` and `awards/`
	`suppliers/id`
	OR `awards/relatedBid`

Methodology

For each contracting process, the *difference* is calculated as:

$$\frac{(secondLowestValidBidAmount - winningBidAmount)}{winningBidAmount}$$

A contracting process is flagged if the difference is greater than or equal to the to the *upper fence* of Q_3 + 1.5(IQR) where Q_3 is the third quartile and IQR is the interquartile range for the set of differences.

The winner is also flagged.

This indicator is included in Cardinal.

Source

Based on "The price offered by the winning bidder is significantly lower than the price offered by the rest of the bidders" in Fraud in Public Procurement: A collection of Red Flags and Best Practices, *"Difference between lowest and second lowest bid prices" in* Assessing the potential for detecting collusion in Swedish public procurement, *and* The Market for "Lemons": Quality Uncertainty and the Market Mechanism.

Unit of analysis

Contracting Process   Bidder

R059 Large difference between the award value and final contract amount

Stage

Planning | Tender | Award | **Contract Implementation**

Type of red flag
Bid-rigging

Definition

The difference between the award and final contract value exceeds a threshold.

Why is this a red flag?

A high difference between the award value and contract value can signal inefficient contracting processes and poorer value for money. Increases in the price before the contract is signed should be reviewed carefully since it can signal the supplier is trying to generate unjustified profits. It can also be a sign of potential corruption where the contract is awarded to a favored bidder for a lower price, and then the price increases after negotiations.

Required data fields

Data fields needed	OCDS fields
• Award and contract amounts and currencies • Award and contract status	`awards/id, awards/status, awards/value/amount, awards/value/currency, contracts/awardID, contracts/value/amount, contracts/value/currency, contracts/status` Note: the winning bid price could be used instead of the award value, if it's not available.

Methodology

For each contracting process where *awards/status* = '*active*' and *contracts/status* = '*active*' OR '*pending*', calculate the difference as:

$$difference = \frac{(contracts/value/amount - awards/value/amount)}{awards/value/amount}$$

A contracting process *i* is flagged if:

$$difference > threshold\ value$$

Where the *threshold value* can be defined by the user (e.g. 30%) or calculated as the *upper fence* of $Q_3 + 1.5(IQR_i)$ where Q_3 is the third quartile and *IQR* is the interquartile range for the set of differences in all contracting procedures.

Example

Italy's anti-corruption agency ANAC calculates a similar indicator in their red flags dashboard (see IND. 5).

Source

Based on "Difference between contract award and final contract amount" in 'Red Flags of Corruption' in World Bank Projects An Analysis of Infrastructure Contracts

Unit of analysis

Contracting Process

R060 Long time between award date and contract signature date

Stage

Planning | Tender | Award | **Contract Implementation**

Type of red flag
Bid-rigging

Definition

Time interval between award date and contract signing date is above threshold value.

Why is this a red flag?

Project officials might find it difficult to justify the award of a contract to a preferred bidder under the procurement rules and delay the award as they attempt to create a justification. The preferred winning bidder and project officials might also be engaged in extended negotiations over the terms of bribe demands, such as the amounts and payment schedules. Finally, project officials might deliberately delay the award beyond the bid validity period in order to support the disqualification of all bidders and the need for re-bidding (IACRC, 2012).

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Award date • Contract signature date • Procurement method	awards/date, contracts/dateSigned, tender/procurementMethod	Maximum period according to the local regulations

Methodology

A contracting process i is flagged if:

$$(contracts/dateSigned_i - awards/date_i) > period_m$$

where i corresponds to each tender, and m to each procurement method. The period might vary depending on the method. It is important to check in local regulations if there is a specific period. Alternatively the period can be calculated as the upper fence of $Q_3 + 1.5(IQR_m)$ where Q_3 is the third quartile and IQR_m is the interquartile range for the set of durations for procurement method m.

Source

Based on Long Delays in Contract Negotiations or Award in <u>*Guide to Combating Corruption & Fraud in Development Projects*</u>.

Unit of analysis

Contracting Process | Bidder

R061 Decision period extremely short

Stage

Planning | Tender | **Award** | Contract Implementation

Type of red flag

Bid-rigging

Definition

Time interval between bid evaluation and award date is below threshold value.

Why is this a red flag?

A short decision period can reflect a premeditated assessment, to favor a particular contractor.

Required data fields

Data fields needed	OCDS fields	Additional information needed
• Tender end date (or bid evaluation start date) • Award date • Procurement method	`tender/tenderPeriod/endDate, awards/date, tender/procurementMethod`	Minimum period according to the local regulations

Methodology

A contracting process i is flagged if:

$$(awards/date_i - tender/tenderPeriod/endDate_i) < period_m$$

where i corresponds to each tender, and m to each procurement method. The period might vary depending on the method. It is important to check in local regulations if there is a specific period. Alternatively the period can be calculated as the *lower fence* of $Q_1 - 1.5(IQR_m)$ where Q_1 is the first quartile and IQR_m is the interquartile range for the set of durations for procurement method m.

Example

Italy's anti-corruption agency ANAC incorporates a similar indicator in their red flags dashboard (see IND. 15).

Source

Based on "Length of decision period" in Uncovering High-Level Corruption: Cross-National Corruption Proxies Using Government Contracting Data

Unit of analysis

Contracting Process

R062 Decision period extremely long

Stage

| Planning | Tender | **Award** | Contract Implementation |

Type of red flag
Bid-rigging

Definition

Time interval between bid evaluation and award date is above threshold value.

Why is this a red flag?

A long decision period can reflect a premeditated assessment, to favor a particular contractor and signal extensive legal challenge to the tender. For instance, officials might be negotiating with the preferred bidder, attempting to create a justification to award the contract or disqualify other bids.

Required data fields

Data fields needed	OCDS fields	Additional information needed

• Tender end date (or bid evaluation start date)
• Award date
• Procurement method
	`tender/tenderPeriod/endDate,`
	`awards/date,`
	`tender/procurementMethod`
		Maximum period according to the local regulations

Methodology

A contracting process i is flagged if:

$$(awards/date_i - tender/tenderPeriod/endDate_i) > period_m$$

Where i corresponds to each tender, and m to each procurement method. The period might vary depending on the method. It is important to check in local regulations if there is a specific period. Alternatively the period can be calculated as the *upper fence* of $Q_3 + 1.5(IQR_m)$ where Q_3 is the third quartile and IQR_m is the interquartile range for the set of durations for procurement method m.

Example

Italy's anti-corruption agency ANAC incorporates a similar indicator in their red flags dashboard (see IND. 15).

Source

Based on "Length of decision period" in Uncovering High-Level Corruption: Cross-National Corruption Proxies Using Government Contracting Data

Unit of analysis

Contracting Process

R063 Contract is not published

Stage

| Planning | Tender | Award | Contract Implementation |

Type of red flag
Low transparency

Definition
Contract document is not published.

Why is this a red flag?
A higher rate of awards without contract information may signal a lack of integrity. No contract can signal that the interaction between the bidders and buyer is not transparent, and relevant interested parties cannot monitor the process.

Required data fields

Data fields needed	OCDS fields
• Contract document • Contract status	contracts/documents/documentType = contractSigned

Methodology

A contracting process *i* is flagged if the contract status is active and:

contracts/documents/documentType$_i$ = contractSigned field is empty or not published

Source

Based on "Award contract and selection documents not all public" in Corruption in Public Procurement: Finding the Right Indicators

Unit of analysis   Contracting Process

R064 Contract has modifications

Stage

| Planning | Tender | Award | **Contract Implementation** |

Type of red flag
Fraud

Definition
Contract has amendments.

Why is this a red flag?
Once the contract is signed, amendments or change orders can be made. While this may be legitimate in some cases, change orders can be manipulated to facilitate corruption or fraud.

Required data fields

Data fields needed	OCDS fields
• Contract amendments • Contract status	contracts/status, contracts/amendments/description

Methodology

A contracting process is flagged if it has amendments (*contracts/amendments* fields are published).

Source

Based on "Changes in contract terms and value" in Warning signs of Fraud and Corruption in Public procurement and "Contract modification" in "An Objective Corruption Risk Index Using Public Procurement Data"

Unit of analysis   Contracting Process

R065 Contract amendments to reduce line items

Stage

Planning   Tender   Award   **Contract Implementation**

Type of red flag
Fraud ⚠️

Definition
Contract modifications issued after contract award, reducing or deleting items.

Why is this a red flag?
Once the contract is signed, amendments or change orders can be made. While this may be legitimate in some cases, change orders can be manipulated to facilitate corruption or fraud.

Required data fields

Data fields needed	OCDS fields
• Contract amendments • Items classification • Contract status Optional: Item quantity	contracts/status, contracts/amendments/description, contracts/amendments/rationale Optional: contracts/items/id, contracts/items/quantity, contracts/items/classification/id, contracts/items/classification/scheme, awards/items/id,awards/items/quantity, awards/items/classification/id, awards/items/classification/scheme

Methodology

A contracting process is flagged if it has amendments to reduce or delete items in the contract. This can be reviewed using the *contracts/amendments/description* or *contracts/amendments/rationale* fields.

Alternatively, if the publisher has the necessary fields, this indicator can be calculated by comparing the award or tender items to the contract items, for contracting processes with amendments. In this case a contracting process i is flagged if:

1. It has an active contract with amendments

2. For the same item j the *awards/items/quantity* < *contracts/items/quantity*, or the item is no longer present in the contracts items array.

Source

Based on "Changes in contract terms and value" in <u>Warning signs of fraud and corruption in public procurement.</u>

Unit of analysis
Contracting Process

R066 Contract amendments to increase line items

Stage

| Planning | Tender | Award | **Contract Implementation** |

Type of red flag
Fraud

Definition
Contract modifications issued after contract award, increasing items.

Why is this a red flag?
Once the contract is signed, amendments or change orders can be made. While this can be legitimate in some cases, change orders can be manipulated to facilitate corruption or fraud.

Required data fields

Data fields needed	OCDS fields
• Contract amendments • Items classification • Contract status Optional: Item quantity and award or tender items	contracts/status, contracts/amendments/description, contracts/amendments/rationale Optional: contracts/items/id, contracts/items/quantity, contracts/items/classification/id, contracts/items/classification/scheme, awards/items/id,awards/items/quantity, awards/items/classification/id, awards/items/classification/scheme

Methodology
A contracting process is flagged if it has amendments to increase items in the contract. This can be reviewed using the *contracts/amendments/description* or *contracts/amendments/rationale* fields.

Alternatively, if the publisher has the necessary fields, this indicator can be calculated by comparing the award or tender items to the contract items, for contracting processes with amendments. In this case a contracting process i is flagged if:

1. It has an active contract with amendments

2. For the same item j the *awards/items/quantity* > *contracts/items/quantity*, or the item in the contracts items array is not present in the awards items array.

Source
Based on "Changes in contract terms and value" in Warning signs of fraud and corruption in public procurement.

Unit of analysis
Contracting Process

R067 Delivery failure

Stage

Planning | Tender | Award | **Contract Implementation**

Type of red flag
Fraud

Definition
Supplier fails to deliver any goods, work or service on time.

Why is this a red flag?
Evidence shows that failure to deliver goods and services, or delivering low quality goods is a strong signal of corruption in the contracting process.

Required data fields

Data fields needed	OCDS fields

• Contract implementation details
• Contract milestones due date and delivery date
	`contracts/implementation/milestones/type = delivery,`
	`contracts/status,`
	`contracts/implementation/milestones/dueDate`
	`contracts/implementation/milestones/dateMet`

Methodology

A contracting process is flagged if the contract is active and it has delivery milestones where:

contracts/implementation/milestones/dateMet > *contracts/implementation/milestones/dueDate*

Source

Based on "Failure to Meet Contract Specifications" in Guide to Combating Corruption & Fraud in Development Projects and "Contract share with sizeable delivery delays" in Governance Risk Assessment System (GRAS) Advanced Data Analytics for Detecting Fraud, Corruption, and Collusion in Public Expenditures.

Unit of analysis
Contracting Process

R068 Contract transactions exceed contract amount

Stage

| Planning | Tender | Award | **Contract Implementation** |

Type of red flag
Fraud

Definition

Total payments to a contractor exceed the initial contract amount.

Why is this a red flag?

Increases in the initial contract value and/or prices of items could signal potential corruption. Cost overruns could also be a result of inefficiencies in the process or bad planning.

Required data fields

Data fields needed	OCDS fields
Contract value, Contract implementation transactions amount	contracts/value/amount, contracts/value/currency, (contracts/implementation/transactions/value/amount, contracts/implementation/transactions/value/currency) OR contracts/implementation/finalValue/amount, contracts/implementation/finalValue/currency See Contract completion

Methodology

A contracting process i is flagged if:

$$\sum_{i}^{n} contracts/implementation/transactions/value/amount_i > contracts/value/amount_i$$

Example

Italy's anti-corruption agency ANAC calculates a similar indicator in their red flags dashboard (see IND. 5).

Source

Based on "Inflated invoices" in Guide to Combating Corruption & Fraud in Development Projects and "Contract share with sizeable cost overruns" in Governance Risk Assessment System (GRAS) Advanced Data Analytics for Detecting Fraud, Corruption, and Collusion in Public Expenditures.

Unit of analysis

Contracting Process

R069 Contract amendments to increase price

Stage

| Planning | Tender | Award | **Contract Implementation** |

Type of red flag
Fraud

Definition
Contract modifications issued after contract award, increasing the price.

Why is this a red flag?
Once the contract is signed, amendments or change orders can be made. While this can be legitimate in some cases, change orders can be manipulated to facilitate corruption or fraud.

Required data fields

Data fields needed	OCDS fields
• Contract amendments • Contract status Optional: contract and award amounts	contracts/status, contracts/ amendments/description, contracts/ amendments/rationale Optional: contracts/value/amount, awards/value/amount

Methodology

A contracting process is flagged if it has amendments to increase the contract price. This can be reviewed using the *contracts/amendments/description* or *contracts/ amendments/rationale* fields.

Alternatively, if the publisher has the necessary fields, this indicator can be calculated by comparing the award or tender value to the contract value, for contracting processes with amendments. In this case a contracting process *i* is flagged if:

1. It has an active contract with amendments

2. The *contracts/value/amount* > *awards/value/amount.*

Source

Based on "Changes in contract terms and value" in Warning signs of fraud and corruption in public procurement *and "Questionable Contract Amendments" in* Guide to Combating Corruption & Fraud in Development Projects.

Unit of analysis

Contracting Process

R070 Losing bidders are hired as subcontractors

Stage

Planning   Tender   Award   **Contract Implementation**

Type of red flag

Collusion risks

Definition

Losing bidders are hired as subcontractors.

Why is this a red flag?

While subcontracting can be legitimate, it may be used as a form of rent sharing in a collusive scheme.

Required data fields

Data fields needed	OCDS fields

• Bidders information
• Subcontractors information
	`tender/tenderers/id` OR `parties/roles = tenderer` AND `parties/id` OR `bids/details/tenderers/id` AND `bids/details/tenderers/name,`
	`contracts/relatedProcesses`
	`contracts/relatedProcesses/relationship = 'subContract'`
	`awards/suppliers/id`
	
	See Related process

Methodology

A contracting process i is flagged if the losing bidder was hired as a subcontractor.

Source

Based on "Prevalence of subcontracting" in Toolkit for detecting collusive bidding in public procurement *and "Bidding patterns" in* Warning signs of fraud and corruption in public procurement.

Unit of analysis   Contracting Process

A contractor subcontracts all or most of the work received

Stage

Planning   Tender   Award   **Contract Implementation**

Type of red flag

Collusion risks

Definition

A subcontractor or subcontractors receive more than 50% of contract payment.

Why is this a red flag?

While subcontracting can be legitimate, it may be used as a form of rent sharing in a collusive scheme.

Required data fields

Data fields needed	OCDS fields
• Subcontracting details	`awards/hasSubcontracting = true, awards/subcontracting/minimumPercentage OR awards/subcontracting/value/amount` AND `awards/value/amount`

Methodology

A contracting process i is flagged if it has subcontracting *awards/hasSubcontracting* = true, and:

1. the awards/subcontracting/minimumPercentage > 0.5

2. Or $\dfrac{\sum awards/subcontracting/value/amount}{awards/value/amount} > 0.5.$

Source

Based on "Prevalence of subcontracting" in Toolkit for detecting collusive bidding in public procurement

Unit of analysis

Contracting Process

R072 High prevalence of subcontracts

Stage

Planning | Tender | Award | **Contract Implementation**

Type of red flag

Collusion risks

Definition

The ratio of contracting processes with subcontracts to total contracting processes is a high outlier per buyer or market.

Why is this a red flag?

While subcontracting can be legitimate, it may be used as a form of rent sharing in a collusive scheme.

Required data fields

Data fields needed	OCDS fields
• Subcontracting details • Buyer information • Items information	awards/hasSubcontracting = true, tender/procuringEntity/name OR buyer/name OR parties/id and parties/name with parties/roles=buyer To calculate by market: tender/items/classification/id (award or contract items could be used instead)

Methodology

A buyer j or a market m is flagged if the ratio:

$$\frac{Number\ of\ tenders\ with\ subcontracts}{Total\ number\ of\ tenders}$$ is greater than or equal to the upper fence of $Q_3 + 1.5(IQR)$

where Q_3 is the third quartile and IQR is the interquartile range for the set of ratios.

Source

Based on "Prevalence of subcontracting" in Toolkit for detecting collusive bidding in public procurement

Unit of analysis

Buyer | Market

R073 Discrepancies between work completed and contract specifications

Stage

Planning | Tender | Award | **Contract Implementation**

Type of red flag

Fraud ⚠️

Definition

The work completed or goods or services delivered do not fulfill the initial tender or contract specifications.

Why is this a red flag?

Low quality or undelivered goods, works or services can be a strong indicator of fraud and corruption.

Required data fields

Data fields needed	OCDS fields

• Contract specifications.
• Documents and reports about the delivery
	`contracts/status,`
	`contracts/documents/`
	`documentType=contractSigned,`
	`contracts/implementation/documents/`
	`documentType='completionCertificate'`
	`OR 'physicalProgressReport',`
	`'finalAudit'`

Methodology

A contracting process is flagged if the contract documents detailing the delivery of the goods and services (competition certificates, progress reports, final audits) signal that the delivery does not meet the initial contract specifications.

This indicator might require a manual review of documents, so it can be hard to automate.

Source

Based on "Failure to Meet Contract Specifications" in Guide to Combating Corruption & Fraud in Development Projects.

Unit of analysis   Contracting Process

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About Open Contracting Partnership

The Open Contracting Partnership (OCP) is an independent nonprofit working in over 50 countries. OCP is a silo-busting collaboration across governments, businesses, civil society, and technologists to improve public procurement by designing goal-driven reforms, building coalitions of change and co-creating digital solutions, powered by open data. OCP makes sure public money is spent openly, fairly, and effectively on public contracts, delivering fundamentally better public spending outcomes so that people can live in more equitable, prosperous, and sustainable communities.

Contact

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