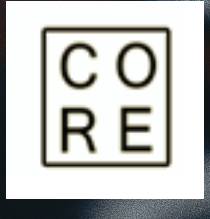
COMPENDIUM OF GOOD PRACTICES IN PUBLIC PROCUREMENT

Use of Data to Improve Integrity in Emergency Times



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Grant Agreement number: 101038790 — CO.R.E — ISFP-2020-AG-CORRUPT
This document was funded by the European Union's Internal Security Fund - Police.

Co-funded by the European Union

Universitat Oberta de Catalunya

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GOOD PRACTICES IN PUBLIC PRO-CUREMENT

Introduction

Transparency in public procurement consists of the knowledge by the citizenry of what happens in the core of the public administration when a tender is announced, awarded and finalized (Cerrillo i Martínez, 2012). By principle, transparency can be compared with a glass house or the sunlight as the best disinfectant (Brandeis, 1914, p. 92). It strengthens the quality of democracy and constitutes a good administration mechanism. In this sense, less opaque procedures facilitate the surrender of accounts, the control of public administrations, and are also an effective means of preventing conflicts of interest as well as fighting corruption. The personal conduct of a server, public manager, and politician in charge tend, for example, to fit the public spirit when is under the public scrutiny. In recent decades, it has been indicated that transparency can contribute to the strengthening of the public integrity (Kaufmann, 2005). Similarly, different empirical studies have concluded that higher levels of information may reduce the level of corruption (Rose-Ackerman & Palifka, 2004). Furthermore, it is also known that the absolute lack of transparency has been identified as one of the main triggers for the emergence of corruption (Kaufmann, 2005), even though transparency by itself may not be enough (Lindstedt & Naurin, 2010; OECD, 2017). Nowadays, transparency usually means the reduction in corruption by preventing it from occurring, which allows citizens to be involved in the fight against corruption (Merloni & Ponti, 2010).In a nutshell, it is one of the mechanisms through which integrity is channeled in public procurement (OECD, 2009) and has a clear impact on public contracting.

Adequate decision-making based on transparent processes may offer fairer while more equitable treatment for potential bidders encouraging and guaranteeing equality to be exercized by public authorities among economic op-

erators. In a sentence of March 12 2008, paragraph 144, case *Evropaïki Dynamiki*, the Court of Justice of European Union summarizes: "The principle of transparency, which is its corollary, is essentially intended to preclude any risk of favouritism or arbitrariness on the part of the authority. It implies that all the conditions and detailed rules of the award procedure must be drawn up in a clear, precise and unequivocal manner in the notice or tendering specifications (Case C-496/99 P Commission v CAS Succhi di Frutta [2004] ECR I-3801, paragraphs 109 to 111)". About the *eVigilo* case, March 12, 2013, subject C-538/13, the court states in paragraph 34 that "The obligation of transparency, which is its corollary, is essentially intended to preclude any risk of favouritism or arbitrariness on the part of the authority with respect to certain tenderers or certain tenders (see, to that effect, judgments in Commission v CAS Succhi di Frutta, EU:C:2004:236, paragraph 111, and Cartiera dell'Adda, EU:C:2014:2345, paragraph 44)". Transparency can produce transcendental effects when other mechanisms for the strengthening of integrity are not available or the existing conditions do not allow the expected impact. An example of that is public procurement under emergency situations in which public administrations must resort to more flexible and agile procedures before making decisions, awarding contracts, allocating resources (for instance, to urgent and emergency contracting for the provision of supplies and services). Directive 2014/24/EU of the European Parliament and Council of February 26 2014 on public procurement, which derogates Directive 2004/18/EC, says the negotiated procedure may be used without prior publicity when tendering reasons of imperative urgency result from events that the adjudicating authority cannot foresee. In critical moments, however, it seems to be consensual the notion of the risks against public integrity are multiplied (Group of States against Corruption (GRECO), 2020b; OECD, 2020). Regarding emergency procedure, it must be subject to the competition of three cumulative conditions (judgment CJUE Comisión/Alemania, of October 15, 2009, subject C-275/08):

- if the public authority announces a tender in an unforeseeable situation;
- extreme urgency under the impossibility of complying with general terms;
- causal relationship between unpredictable success and extreme urgency.

The Spanish Public Sector Contract Act has transposed this normative framework providing that in cases where the public administration is supposed to give immediate responses due to catastrophic events. Situations carrying serious risks or needs that may affect the national defense, for instance, authorities can freely hire or order the execution of the work, service or supply without the obligation to ordinarily process a public contract (article 120.1). In this regard, when the three circumstances aforementioned meet, the public administration can then adjudicate a contract without being subject to the ordinary requirements. During the COVID-19 health crisis, the European Commission's Guidelines advise the adjudicating authorities to be able to substantially reduce the deadlines for contracting procedures. In the case of a similar measure is not possible, the document indicates that a negotiated procedure without publication should be used. In addition, a preselected economic operator can even be awarded a direct contract when it is the only supplier within technical as well as temporal constraints imposed by the extreme urgency (OECD, 2020). In this direction, the Royal Decree 7/2020 of March 12, by which urgent measures are taken to respond to the economic impact caused by the COVID-19 (modified by the Royal Decree 9/2020 of March 27), affirms that the actions that directly or indirectly are related to the COVID-19 pandemic should be covered by the Spanish Public Sector Contract Act. Therefore, it enables public contracts under emergency times to be awarded out of the ordinary application of the guarantees seen in the regulation to be carried out by the contractor (article 16).

The absence of the procedure for the award of contracts in an emergency situation grants the adjudicating authorities greater flexibility and an evident reduction of time. On the other hand, public procurement under emergency also implies less transparency during its preparation This is why a higher level of information is required on these contracts awarded. In addition, data on its execution or on eventual modification of contracts facilitates the control as well as the surrender of accounts. Data supports the detection of irregularities and cases of corruption, since emergency situations tend to lead the growth of corruption in public administration (Abdou, Basdevant, Dávid-Barrett, & Fazekas, 2022; Czibik, Tóth, & Fazekas, 2015; Fazekas, 2017; Fazekas & Kocsis, 2020; Fazekas, Nishchal, & Søreide,

2021; Schultz & Søreide, 2008). As Rose-Ackerman and Palifka observe that "en todos los casos el conflicto y sus postrimerías crearon incentivos corruptos y dieron a los actores nacionales e internacionales excusas para hacer la vista gorda ante la corrupción" (Rose-Ackerman & Palifka, 2019), and indeed some forms of corruption involving international actors are prevalent during emergency times (ICAC, 2020). During the last decades, numerous cases of corruption linked to the management of crisis and emergency situations have been identified, e.g., the case of hurricane Katrina in 2005, of the HIV or Ebola pandemics in West Africa in 2014 among others (OECD, 2020; U4 Brief, 2015).

It is evident that transparency appears as a necessary mechanism preventing conflicts of interests and corruption, however, it has a specific meaning in public contracting. The guarantee of transparency is precisely one of the keys to ensure that public resources are used effectively and efficiently. Public administrations can tackle emergencies and, concomitantly, generate confidence in how public institutions respond to them (World Bank, 2020a, 2020b). In view of the public administration's response to emergency situations, transparency acquires significant relevance not only making their own decisions to be known or their priorities on resources to be publicized, but also to be subject to public scrutiny. The special circumstances in which public decisions are taken in times of crisis give a special value to transparency . As the president of the Group of States against Corruption of the Council of Europe (GRECO) declared: "The need for regular and reliable information from public institutions is crucial in times of emergency. This concerns the spread and risks of the pandemic as such, but also emergency measures taken in response to them" (Group of States against Corruption (GRECO), 2020a). Nonetheless, as we have already warned, in emergency situations, transparency in public procurement tends to decrease significantly risks during the preparation and award of a contract, particularly, when an ordinary procedure is not necessary or a tender is not required to be announced. In this regard, article 120 of the Spanish Public Sector Contract Act provides that a 30-day account must be given for the agreements relating to emergency contracting adopted by the Spanish Council of Ministers or the government councils of the Autonomous Communities. However, it does not mean that any extraordinary procedure should be an obstacle for public administration

to publish an awarded and formalized contract in their public procurement webpages in a five-day period.

> The transparency of the public procurement consists of the knowledge by the citizenry of what happens in the core of the public administration when a tender is announced, awarded and finalized.

Concerning the general nature of contract publicity in articles 151 and 154 of the Spanish Public Sector Contract Act, also referring to article 63 of the same act, the Consultative Board of Public Contracts of the State in its report 22/2020, which was addressed to the Council of Ministers specifically on public procurement under emergency times, advised that: "the mandatory publication of these contracts will have to be limited, however, it must be taken into account that there is no previous procedure for those ordinary formalities". The Presidency of the Consultative Board of Public Contracts of the Spanish State prepared a document clarifying the procedure for the publication of emergency contracts caused by the COVID-19. It says that: "The immediate action that supports the recourse to the emergency procedure cannot require the prior publication of the announcement of a tender". It is not even predictable the same specifics for contracts following the profile of the contractor publicity while the contracting body is adjudicating and formalizing acts. The publicity regime is oriented by a general basis provided by articles 151.1 and 154.1 of the Spanish Public Sector Contract Act. Publication in these cases should, however, be limited to whatever is relevant considering that there is no prior procedure with the usual procedures" nor "there is a precaution regarding exceptions for publication in the corresponding official periodicals". Nonetheless, the fulfillment of these requirements has been quite irregular among different levels of public administration. Some of them have not yet been complied with by public authorities or have even delayed their obligations. According to the report prepared by the Oficina Independiente de Regulación y Supervisión de la Contratación, "there is an asymmetrical publicity" being identified "out of the 5,922 contracts processed using extraordinary measures linked to the COVID-19 pandemic published on

the Plataformas de Contratación Autonómicas, 1,667 contracts are not included among the contracts published by PLACSP [Spanish public procurement webpage] in their". In particular, the OIRESCON reports that "a series of publications with anomalies or confusion of concepts has been identified impeding the accurate identification of an individual contract, and, consequently, the information that must be included in the corresponding announcement. In this sense, given the growing and exorbitant volume of contracting by way of emergency as a result of the COVID-19 crisis, special care and detail related to the public contracts especially under emergency times is recommended. Subsequent scrutiny on the contract justification and its adaptation to the norm as well as which citizenry rights would be violated if these adjudications proceed inappropriately may lead citizens to interpose an appeal to the contentious-administrative" (OIRESCON, 2020).

According to Directive 2014/24/EU of the European Parliament and of the Council of the 26 February 2014, the award of public contracts is bound by the Treaty on the Functioning of the European Union elucidating in its Preamble the free movement of goods, freedom of establishment and the freedom to provide services. It also mentions the principles of equal treatment, non-discrimination, mutual recognition, proportionality and transparency.[1] In addition, public contracts should be published by electronic means simplifying hence the process as well as increasing efficiency and transparency. As the standard means of communication and information exchange between public authorities and economic operators in public, they must include the "transmission of notices in electronic form, electronic availability of the procurement documents and – after a transition period of 30 months – fully electronic communication, meaning communication by electronic means at all stages ofi the procedure, includ-

[1] Read "(1) The award of public contracts by or on behalf of Member States' authorities has to comply with the principles of the Treaty on the Functioning of the European Union (TFEU), and in particular the free movement of goods, freedom of establishment and the freedom to provide services, as well as the principles deriving therefrom, such as equal treatment, non-discrimination, mutual recognition, proportionality and transparency". See Directive 2014/24/EU of the European Parliament and of the Council of the 26 February 2014. Regarding the principles of awarding contracts, article 76.1 says "Member States shall put in place national rules for the award of contracts subject to this Chapter in order to ensure authorities comply with the principles of transparency and equal treatment of economic operators. Member States are free to determine the procedural rules applicable as long as such rules allow authorities to take into account the specificities of the services in question".

ing the transmission of requests for participation and, in particular, the transmission of the tenders (electronic submission) should be made mandatory".[2]

Although the Member States are not obliged to carry out electronic processing of tenders, for example, forced to realize electronic auctions or make electronic submissions mandatory, the electronic means of communication must be "non-discriminatory, generally available and interoperable with the ICT products in general use and which do not restrict economic operators' access to the procurement procedure"'.[3] Yet on the restrictions that should be eliminated from the stages, the directive also affirms that the means of communication shall be adapted to those persons with disabilities and should not require specialized tools, complex file formats or specialized office equipments having in mind, naturally, the exceptions: " authorities should therefore not be obliged to require the use of electronic means of communication in the submission process in certain cases, which should be listed exhaustively. This Directive stipulates that such cases should include situations which would require the use of specialised office equipment not generally available to the authorities such as wide-format printers. In some procurement procedures the procurement documents might require the submission of a physical or scale model which cannot be submitted to the authorities using electronic means. In such situations, the model should be transmitted to the authorities by post or other suitable carrier".[4] Point 55 of Directive 2014/24/EU puts emphasis on the technical formats for the electronic means of communication. In order to diminish the obstacles to data interoperability, the Member States should comply with "a format for the presentation and organisation of information in a manner that is common to all the participating bidders ". That indicates public procurement procedure has to be prepared in way electronic treatment of information produces standard catalogues permitting a more uniform electronic system of public procurement across the European Union: "Standardising the catalogue formats would thus improve the level of interoperabil-

[2] Read point 52 of Directive 2014/24/EU.

[3] Read point 53 of Directive 2014/24/EU. The abbreviation ICT stands for "information and communication technology".

[4] See footnote 3. Still concerning the exceptions, authorities are allowed not to use electronic means of communication with the purpose of protecting particularly sensitive nature of information providing therefore necessary level of protection. Read point 54 of Directive 2014/24/EU.

ity, enhance efficiency and would also reduce the effort required of economic operators".[5] The reasons for electronic standards and interoperable systems are various and not only restricted to the effects of a public tender being more transparent nor competition. It has also to do with the storage of updated information and recent data on public procurement which eventually base the decision-making process of authorities. In addition, technical aspects play an important role for the European Commission: "The Commission should therefore envisage promoting measures that could facilitate easy recourse to up-to-date information electronically, such as strengthening tools offering access to virtual company dossiers, or means of facilitating interoperability between databases or other such flanking measures".[6]

Part I of the present document is called **Good Practices in Public Procurement**. It brings four chapters being **chapter** 1 about those good practices on public procurement webpages dividing the results in three levels, e.g., the lowest, the mid-level and the highest scores. Then we present the outputs of the functions and features through two case studies, Spain and Cyprus. **Chapter** 2 refers to those good practices on open data, that is to say, if the information on public contracts is accompanied by functions and features ready to be used. It is important to highlight that we do not assess the data, its quality, accuracy, completeness etc, but if the country has created features and functions able to share as well as integrate the data on public procurement in their respective portals. **Chapter** 3 is devoted to the re-use of information. We identify and list those non-governmental or partially governmental initiatives in cooperation with the private sector dedicated to the development of APIs. The idea is to check how civil society has responded to the lack of transparency or how they fight against corruption using official data on public procurement. **Chapter** 4 suggests a comparative overview on different indicators about the perception of corruption with the purpose of making clear that the SCO.R.E. are based on the evidence.[7] The values collected in our indicator come from the functions and features identified on official public procurement and open data government webpages.

[5] Read point 55 of Directive 2014/24/EU.
[6] Read point 85 of Directive 2014/24/EU.
[7] The abbreviation SCO.R.E. stands for "scores for the Project Corruption Risk Indicators in Emergency.

Part II , **Constructs and Variables** has three more chapters. **Chapter** 6 introduces a full explanation of the constructs and variables used in our work. Syntactic and semantic definitions for the SCO.R.E. are suggested as well as a detailed description of how we attributed the values and weight to our indicator. **Chapter** 7 shows the disaggregation of our data set splitting the evidence collected in three constructs, i.e., availability, interoperability and reusability. The same criterion is applied to both public procurement and open data government webpages. **Chapter** 8 helps us compare the SCO.R.E. with the ISO25000. The main goal is to test how far our definitions used in our indicator match with the ones in the SQuaRE Portal Model. We also test statistically the SCO.R.E. with two multiple linear regressions, a Pearson correlation coefficient, and the calculation of a mean squared error taking into consideration other indexes.

Good Practices in Public Procurement

To classify and quantify the functions as well as the features for the public procurement webpages, fifty variables were created. Thirty-four of them have been applied to general information on public and sixteen particularly retaining functions and features regarding public procurements under emergency times. The overall score for public procurement webpages is 61.170 representing the availability construct a total of 50.130; interoperability, 4.575; and re-usability, 6.465.[1]

■ **Availability** is the construct that brings those functions and features on public procurement webpages concerning contracts and contract data to light. The more they are fully used the more they strengthen integrity in public administration. The availability of information on tenders is also checked observing whether the public procurement data is present in many different places and in different formats making stronger the other two constructs.

■ **Availability-Completeness** indicates whether information on public contracts can be found, for instance, detailing contract amounts, contract duration, updates, number of tenders, tender identification, emergency justification among other aspects.
■ **Availability-Easy Access** refers to whether there is a specific inter-

[1] In **chapter** 2, we will introduce the outputs related to the government open data portals with more 30 variables assessing the constructs availability, interoperability and re-use of information regarding open data government portals for public contracts. The sum of the webpages assessment, both for public procurement and open data governmental portal, varies from 0 to 100.

nal/external webpage for emergency contracting, information on emergency contracting, hyperlinks/buttons for emergency contracting procedure, site map, complaint channel or anonymous disclosure.

■ **Availability-Understandability** checks the information referring to different levels of the public administration, advice guiding the user through information complexity on public contracting.

■ **Availability-** makes sure whether last-update and update-frequency functions are available and used to publish tenders on public procurement webpages.

■ **Availability-Data Openness** collects information on data format and open data standard, basically to see what types of file extensions are available or whether they are compatible with open data standards.

■ **Interoperability** is another construct that helps us examine whether the information on public procurement webpage is present at different government levels redirecting the user through links, hyperlinks or buttons to contracting webpages of regions and municipalities. It supports also the evaluation of interoperability standards since the integration of information on public contracts available on e-procurement webpages is expected to occur on other e-procurement portals involving all levels of administration with competence to announce and sign contracts. The existence of hyperlinks specially for public contracting under emergency times constitutes another relevant function in this construct. The ideal element for this construct is the progressive differentiation of ordinary from emergency public contracting. In terms of preparedness and digital services, the more the functions separating ordinary from extraordinary public procurement with interoperable data, the more the transparency in public administration as a whole.

■ **Re-usability** is the last construct on public contracting data for public procurement government webpages. The presence of APIs may facilitate the job of civil society representatives, non-governmental organizations and also the press to conduct fact-checking whenever is necessary. The collected and compiled data helped us gauge the functions and features on fees, how the free-use of information has been conceived, data re-use licence communicated, and whether the information on public contracts is machine-readable.

1.1 Lowest, mid-level and highest scores

Boxes 1, 2 and 3 contain the outputs about every country for the construct **availability**. The results were subdivided into three separate levels, i.e., the lowest, the mid-level and the highest scores. Cyprus, Croatia and Luxembourg had their public procurement government webpages scoring fewer points since their portals for public procurement showed less functions and features compared to France, Germany, Greece or Austria. Hungary, Sweden, Romania, Malta, Czech Republic and Latvia, for instance, have been better positioned compared to the lowest classification due to the use of more functions as well as features on their public procurement webpages. Slovakia, Lithuania, Denmark, Netherlands, Ireland and Poland have higher scores or high mid-level positions, but behind Belgium, Spain, Bulgaria, Portugal, Slovenia, Italy, Finland, and Estonia. The same subdivision was created for the other constructs **interoperability** and **re-usability**, i.e., the lowest, the mid-level and the highest scores. It is important to mention that these outputs systematized in the following boxes do not say whether a country is less or more corrupt than the others, but whether a webpage for public procurement of each EU country has more function and features used or potentially ready to be used promoting, therefore, more integrity in public procurement through their e-procurement portals. A detailed explanation and the criteria applied to these three constructs resulting in the scores herein displayed will be seen in **chapter** 6. For now, we bear in mind that the total score covering the three constructs is 61.170 in a scale 0-100 and the same constructs applied to open data government webpages sum 38.830. In short, most countries have scored less than expected if compared to other indicators on transparency and corruption. The reason for that derives from the fact of many public procurement webpages operate or have been designed with fewer functions and features reducing then the availability of data.

Box 1. Availablity Max. 50.130

Cyprus 15.0 Croatia 17.7 Luxembourg 18.8 Limited in terms of functions and features. Completeness: No details on contract amounts, contract duration, no updates, no number of tenders, no tender identification nor emergency justification. Easy Access: No internal/external webpage for emergency, no information on emergency, no hyperlinks/buttons for emergency procedure, no site map, no complaint channel neither anonymous disclosure. Understandability: No information referring to different levels of the public administration, no feature guiding the user through information complexity. : Cyprus and Luxembourg, not efficient last-update and update-frequency functions. Data Openness: Croatia and Cyprus, neither data format nor standard.

France 25.1 Germany 26.1 Greece 27.9 Austria 28.7 Restrictions or links redirecting the user to other portals. Completeness: no information on contract type, contract updates nor number of tenders. No tender names, no tender identification nor hard copy of contracts. No feature showing emergency justification. Easy Access: France, Germany and Greece have no internal/external webpage for emergency, no information on emergency nor anonymous disclosure functions. Understandability: France, Germany and Greece are poor in graphics about public. : Austria, France and Germany, no last-update nor update-frequency functions. Data Openness: Austria, no nor standard. The score of Austria could be higher if the access of its public procurement webpage was not mostly restricted.

Hungary 30.9 Sweden 31.6 Romania 32.6 Malta 34.4 Czech Rep. 34.4 Latvia 34.5 More information on contracts, but could enhance emergency functions. Completeness: Except Latvia, no information on emergency justification. No function for open tender notice. Easy Access: No internal/external webpage for emergency, and

except Romania, no information on emergency. No hyperlinks/buttons for emergency procedure. ■ Understandability: Except Czech Republic, the other countries are poor in graphics about public. ■: No last-update function for Hungary. No update-frequency function for Hungary nor Romania. ■ Data Openness: All countries have functions for format and standard.

Slovakia 36.3 Lithuania 36.3 Denmark 37.2 Netherlands 37.3 Ireland 38.1 Poland 38.1 ■ Completeness: Denmark and Ireland show no information about the number of tenders competing. ■ Easy Access: no internal/external webpage for emergency and, except Ireland, Poland and Slovakia, no information about emergency. Except Poland, no hyperlinks/buttons for emergency procedure. ■ Understandability: Except Netherlands, the other countries are poor in graphics about public. ■: Slovakia has shown no function for update frequency. ■ Data Openness: All countries have functions for format and follow standard.

Belgium 39.1 Spain 39.1 Bulgaria 40.0 Portugal 40.0 Slovenia 40.0 Italy 40.0 Finland 41.9 Estonia 42.7 ■ Completeness: Portugal and Slovenia show no data on emergency justification. No country with open tender notice function. Finland with function for hard copy contracts.■ Easy Access: no internal/external webpage for emergency and, except Estonia, no information on emergency. ■ Understandability: Spain has shown no function for graphics on public. Italy has no function to reduce information complexity. ■: All countries scoring more have functions and features that may potentialize. ■ Data Openness: All countries scoring more in openness have functions and features that may potentialize data openness.

Box 2. Interoperability Max. 4.575

Austria 0.95 Croatia 0.95 Cyprus 0.95 France 0.95 Germany 0.95 Greece 0.95 Hungary 0.95 Luxembourg 0.95 Sweden 0.95 ■ Different government levels: All countries have shown functions redirecting the user to other government webpages on public procurement. ■ Interoperability standards: No functions found integrating nor sharing the information on public contracts meaning that a public tender or an award available on the State e-procurement webpage does not necessarily appears on other e-procurement portals at a local level or vice-versa. ■ Hyperlinks to other government levels: No hyperlinks specially for public under emergency times. The case of Austria could be different if its public procurement webpage was not under restrictions for non-registered users.

Denmark 2.76 Romania 2.76 ■ Different government levels: These countries have functions redirecting the user to other government webpages on public procurement ■ Interoperability standards: Functions to integrate and share the information on public contracts were found. Enhancement and more integration recommended to make the information on State public procurement webpage appear at a local level. ■ Hyperlinks to other government levels: No hyperlinks specially for public under emergency times.

Malta 4.575 Czech Rep. 4.575 Latvia 4.575 Lithuania 4.575 Slovakia 4.575 Netherlands 4.575 Ireland 4.575 Poland 4.575 Belgium 4.575 Spain 4.575 Bulgaria 4.575 Portugal 4.575 Slovenia 4.575 Italy 4.575 Finland 4.575 Estonia 4.575 ■ Different government levels: All countries have shown functions redirecting the user to other government webpages on public procurement ■ Interoperability standards: Functions to integrate and share the information on public contracts were found. More integration recommended to make the information on State public procurement webpage appear at a local level. ■ Hyperlinks to other government levels: Hyperlinks specially for public under emergency times were found, although the information may be excessively

abbreviated, incomplete or insufficient.

Box 3. Re-Usability Max. 6.465

Austria 1.89 Croatia 1.89 ■ API: functions and features making possible the use of APIs were found. ■ Metadata: Documents concerning metadata for public procurement were found. ■ Information on fees: No information on fees was detected. ■ Free re-use or data re-use licence: No information was detected. ■ Machine-readable data: Restrictions, which is the case of Austria, or pdfs or Word files make difficult the re-use of data on public.

Belgium 5.520 Bulgaria 5.520 Cyprus 5.520 Denmark 5.520 Estonia 5.520 Finland 5.520 France 5.520 Germany 5.520 Greece 5.520 Italy 5.520 Ireland 5.520 Latvia 5.520 Lithuania 5.520 Luxembourg 5.520 Malta 5.520 Netherlands 5.520 Poland 5.520 Portugal 5.520 Romania 5.520 Slovakia 5.520 Slovenia 5.520 Spain 5.520 Sweden 5.520 ■ API: functions and features making possible re-use of information via APIs were found. ■ Metadata: Documents concerning metadata for public procurement were found. ■ Information on fees: Information on fees was not detected and if found incomplete. ■ Free re-use or data re-use licence: Information detected. ■ Machine-readable data: No restriction impeding the data to be re-used.

Czech Rep. 6.465 Hungary 6.465 ■ API: functions and features making possible the re-use of information via APIs were found. ■ Metadata: Documents concerning metadata for public procurement were found. ■ Information on fees: Information on fees detected. ■ Free re-use or data re-use licence: Information detected. ■ Machine-readable data: No restriction impeding the data to be re-used.

Figure 1.1 displays the outputs for the three constructs for all the EU countries. It reflects how countries scoring low in other indicators have the digital instruments to reduce opacity in public contracting. Countries like Estonia and Slovenia have advanced a lot in adapting or changing their public procurement webpages in order to create the conditions to make more data on pub-

lic contracting available. The functions and features of their webpages give the support to store more data on public contracting under emergency times.

Figure 1.1: Distribution of the outputs for public procurement webpages

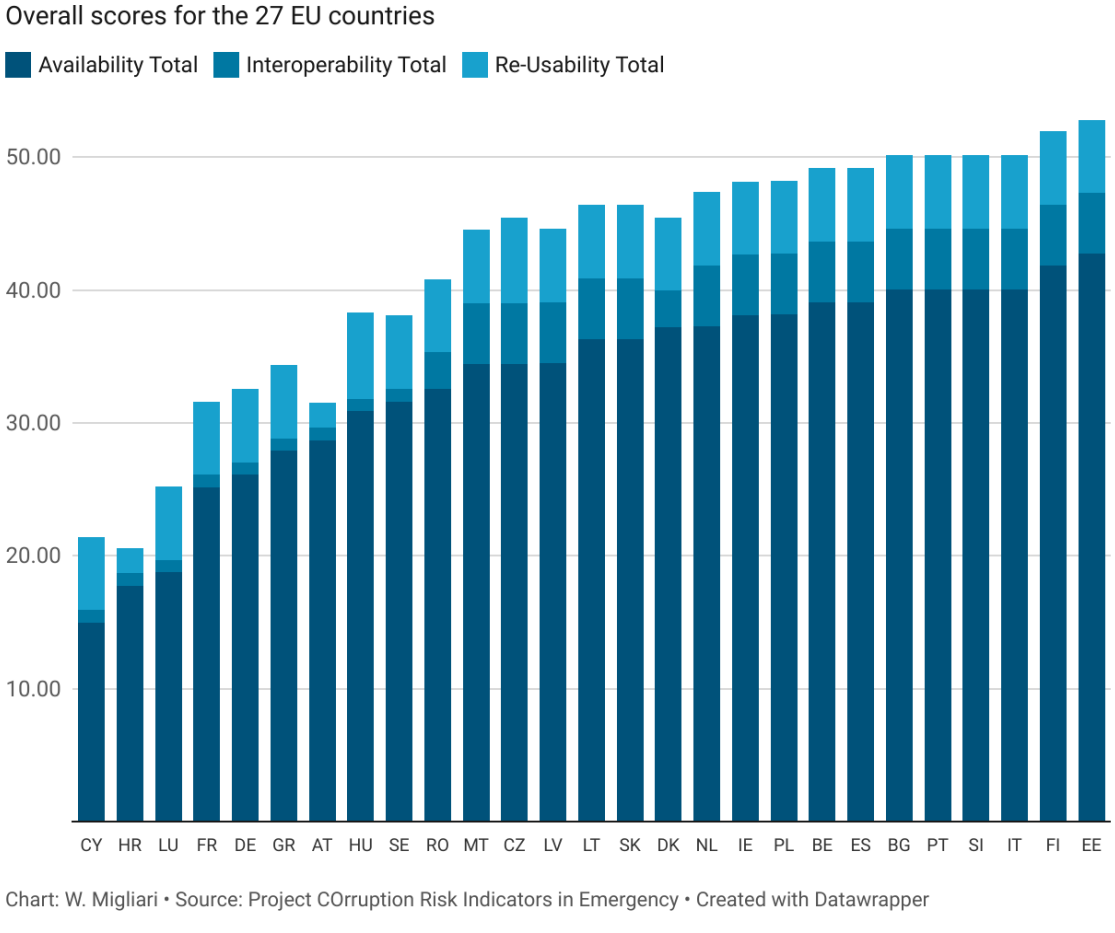
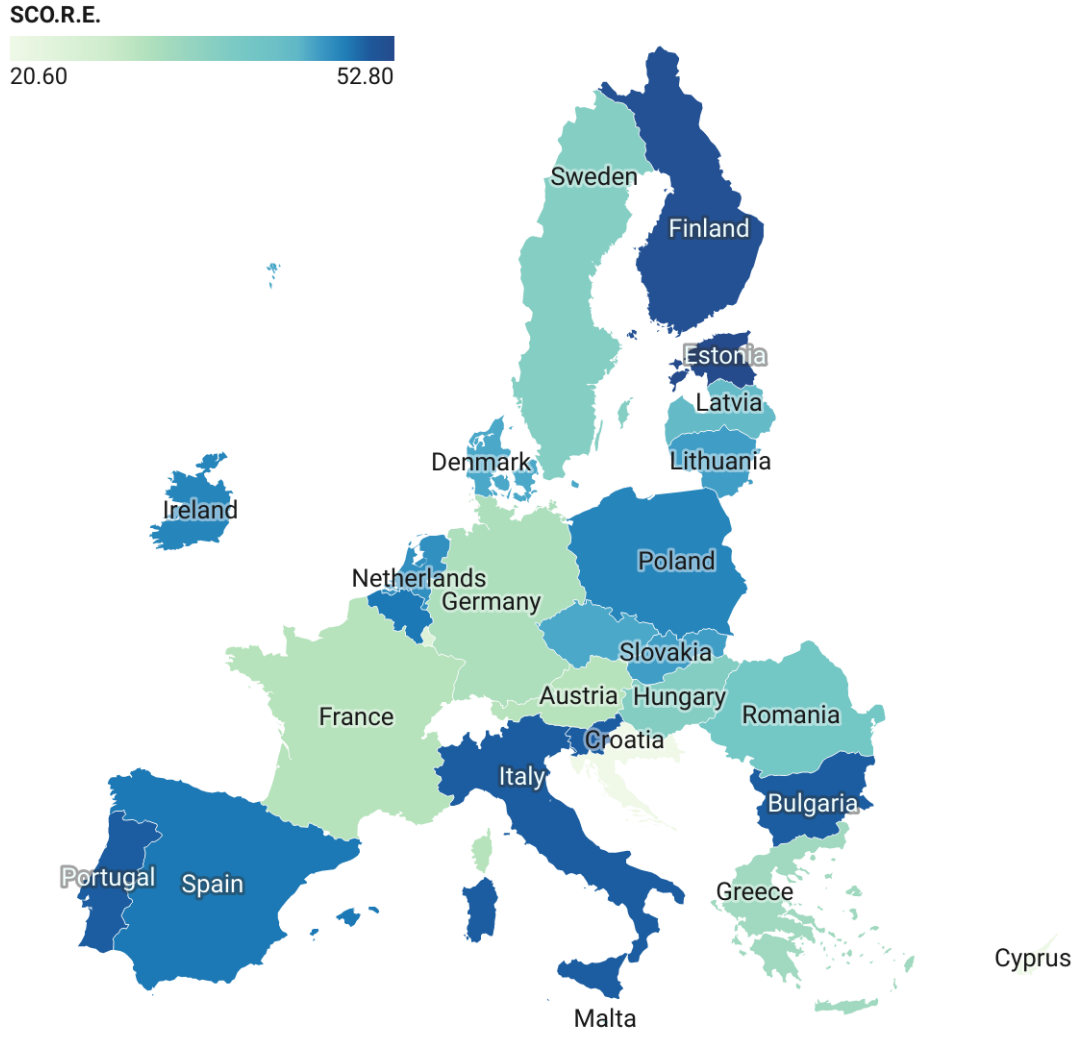


Figure 1.2 shows the outputs for availability, interoperability and re-usability we have collected so far. The fact that Bulgaria, Italy, Portugal and Spain have scored well, it does not mean that these countries have increased their level of transparency or integrity.

Figure 1.2: Scores for public procurement webpages in the EU

Scores for data availability, interoperability and re-usability on public procurement webpages



Map: W. Migliari • Source: Project COrruption Risk Indicators in Emergency • Created with Datawrapper

These results are evidence of the opposite, that is, these countries have the digital tools to improve the quantity and quality of data on public procurement. Interoperability, for instance, is still a challenge for these countries since sharing and integrating information may not be a priority for their public administration compared to another task force.

Figure 1.3: Scores for public procurement in the EU

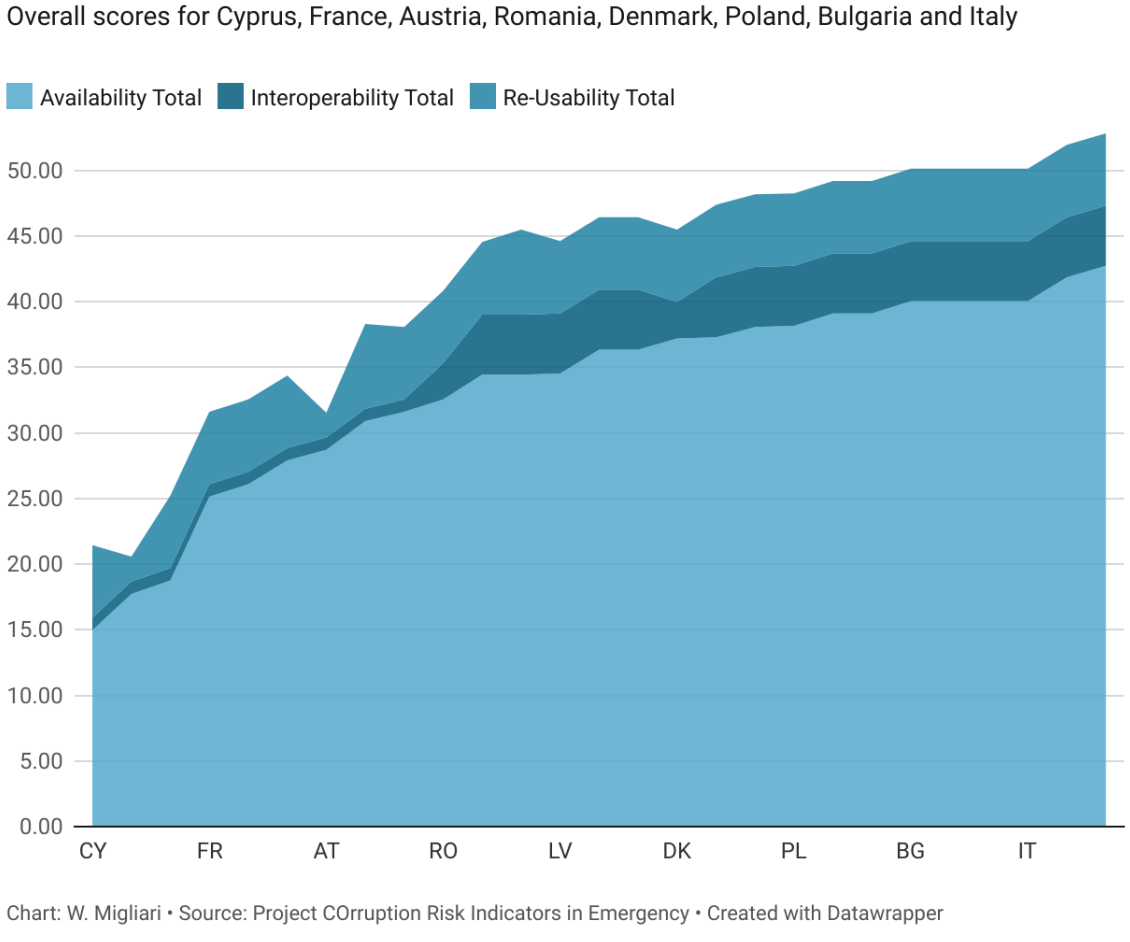


Figure 1.3 elucidates how countries like Bulgaria, Italy and Poland are ranking higher than France, Austria and Denmark. It important to strengthen that the collection of data on availability, interoperability and re-usability points out that we are measuring those functions and features already existent as well as indicating the lack of tools in other cases like Cyprus, Romania and Latvia. The complete score on public procurement including the three constructs can be seen in Table 1.1. It shows the outputs for the 27 European countries. More details on the scores will be introduced by chapter 7 considering not only public procurement, but also government open data webpages. In section 7.1, the disaggregation of the SCO.R.E. shows more details about the three constructs initially discussed herein.

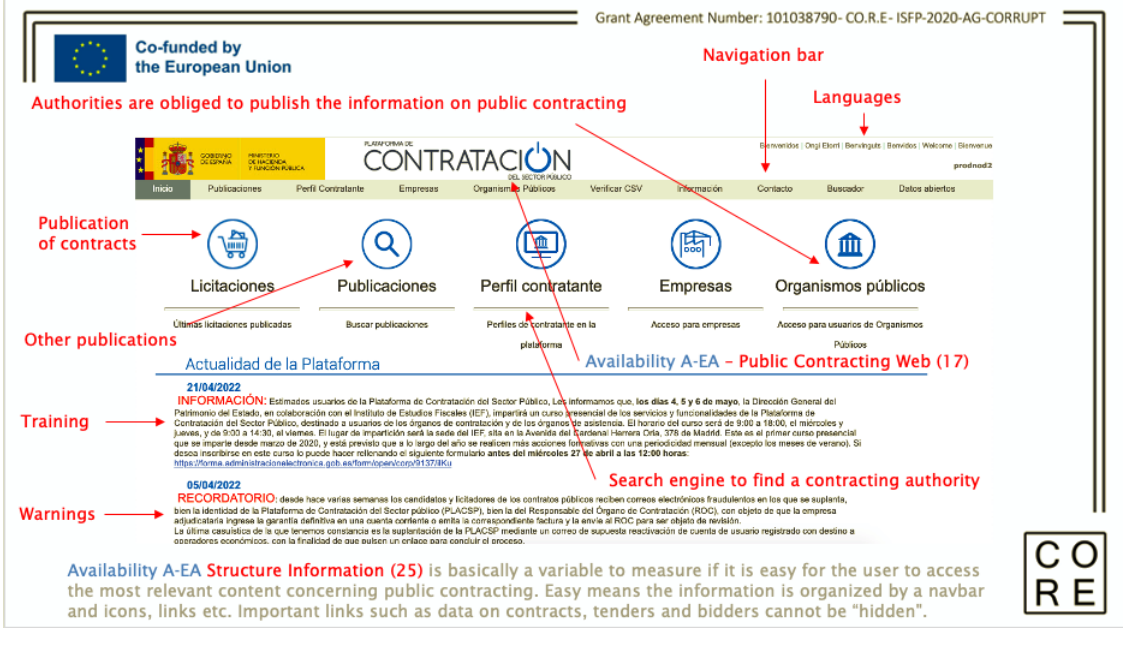
Table 1.1: Scores for data availability, interoperability and re-usability on public procurement webpages in the EU

Country	Availability Total	Interoperability Total	Re-Usability Total	Total
	Max. 50.130	Max. 4.575	Max. 6.465	Max. 61.170
Cyprus	14.970	0.945	5.520	21.435
Croatia	17.730	0.945	1.890	20.565
Luxembourg	18.750	0.945	5.520	25.215
France	25.140	0.945	5.520	31.605
Germany	26.085	0.945	5.520	32.550
Greece	27.900	0.945	5.520	34.365
Austria	28.695	0.945	1.890	31.530
Hungary	30.885	0.945	6.465	38.295
Sweden	31.605	0.945	5.520	38.070
Romania	32.550	2.760	5.520	40.830
Malta	34.440	4.575	5.520	44.535
Czech Rep,	34.440	4.575	6.465	45.480
Latvia	34.515	4.575	5.520	44.610
Lithuania	36.330	4.575	5.520	46.425
Slovakia	36.330	4.575	5.520	46.425
Denmark	37.200	2.760	5.520	45.480
Netherlands	37.275	4.575	5.520	47.370
Ireland	38.070	4.575	5.520	48.165
Poland	38.145	4.575	5.520	48.240
Belgium	39.090	4.575	5.520	49.185
Spain	39.090	4.575	5.520	49.185
Bulgaria	40.035	4.575	5.520	50.130
Portugal	40.035	4.575	5.520	50.130
Slovenia	40.035	4.575	5.520	50.130
Italy	40.035	4.575	5.520	50.130
Finland	41.850	4.575	5.520	51.945
Estonia	42.720	4.575	5.520	52.815

1.2 Distribution of points in two case studies

It is noteworthy that there are forty-two variables representing the construct availability while only three for interoperability and five for re-usability. This unbalanced count for each construct is due to the presence of more functions and features for availability on all public procurement webpages in the EU, i.e., accessibility-completeness, easy access, understandability of information, and openness.

Figure 1.4: Spanish public procurement webpage



Figures 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, 1.16, 1.17, 1.18, 1.19, 1.20, and 1.21 help us identify the functions and features on the Spanish public procurement webpage. Variables 12, 18, 19, 23, 27, 28, 29, 33, 48 and 55 were not found. Figures 1.22, 1.23, 1.24, 1.25, 1.26, 1.27, and 1.27 illustrate how the Cypriot public procurement webpage scored based on the same variables applied to the Spanish portal on public. Variables 01, 05-09, 11-16, 18, 19, 23, 26-31, 33-36, 39-42, 44, 45, and 48 were not found. In chapter 7, Tables 7.1, 7.2, 7.3, and 7.4 indicate the sequential numbers attributed to each variable. Therefore, based on the information collected, we can affirm that it is a portal with those necessary tools to enhance integrity in

public in Spain. It is important to mention that these functions and features do not automatically lead the country to a more transparent society, but the use of these digital instruments as a common behavior in public administration.

Figure 1.5: Spanish public procurement webpage

Figure 1.6: Spanish public procurement webpage

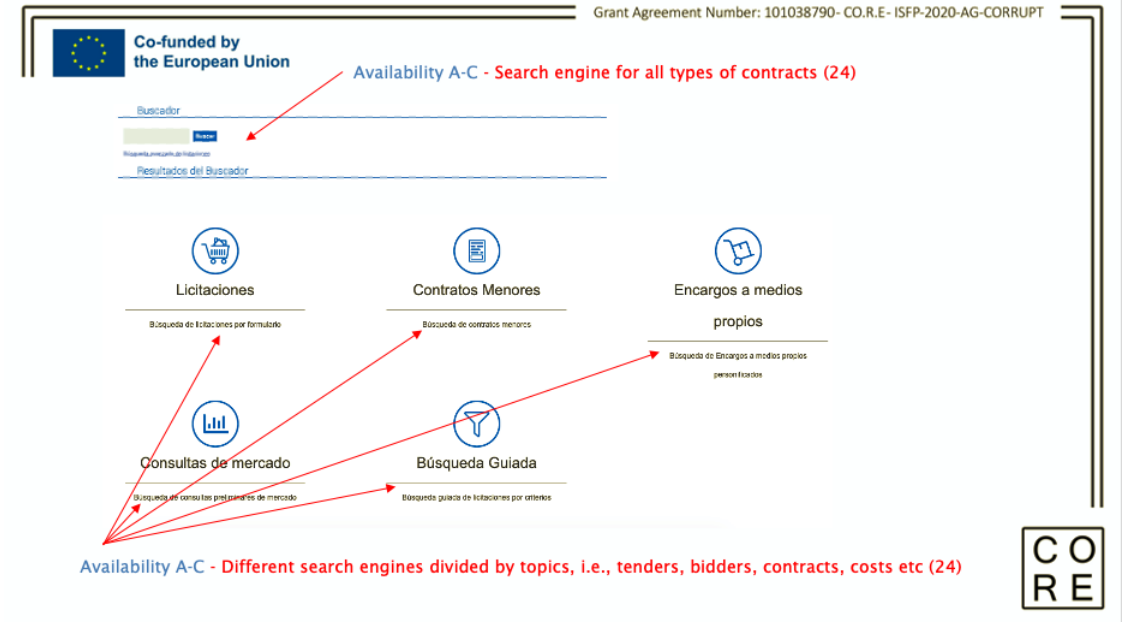


Figure 1.7: Spanish public procurement webpage

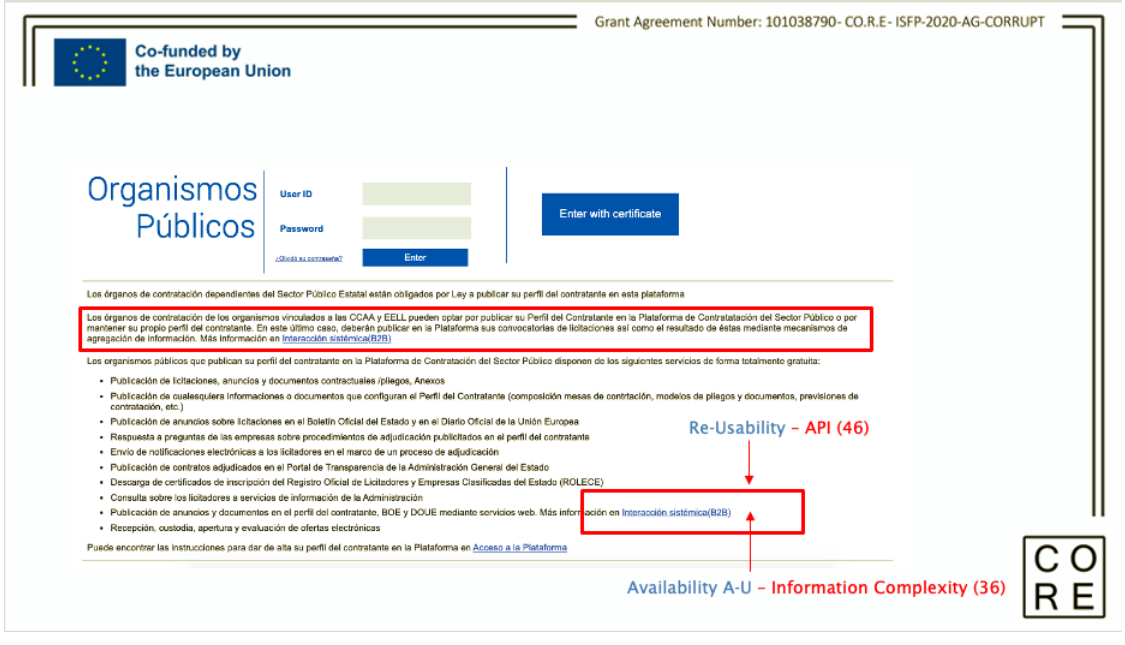


Figure 1.8: Spanish public procurement webpage

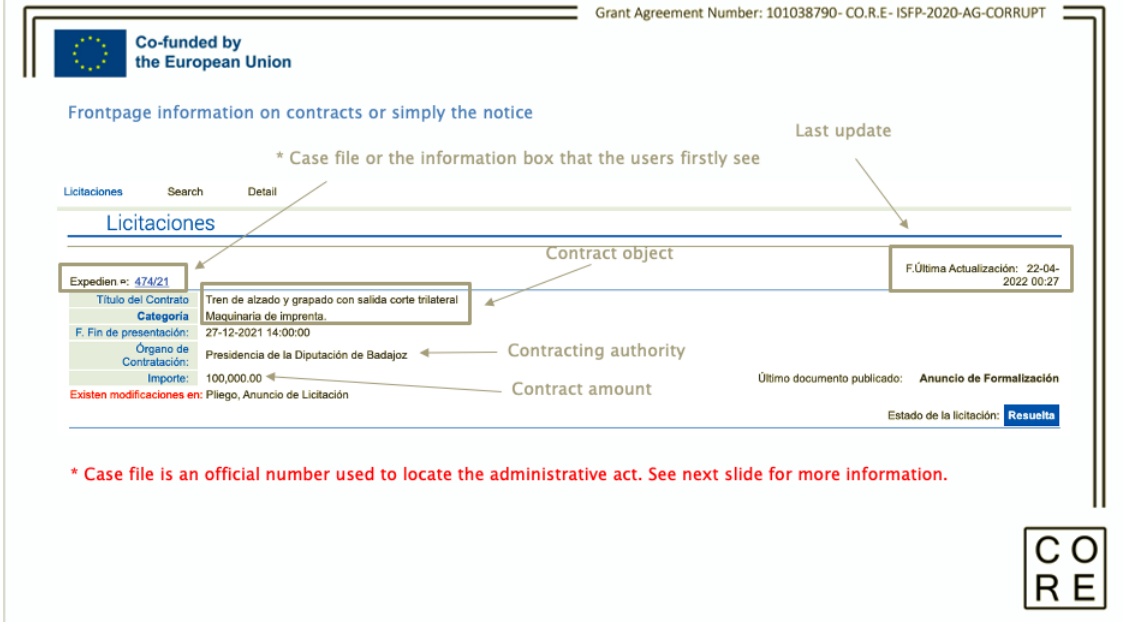


Figure 1.9: Spanish public procurement webpage

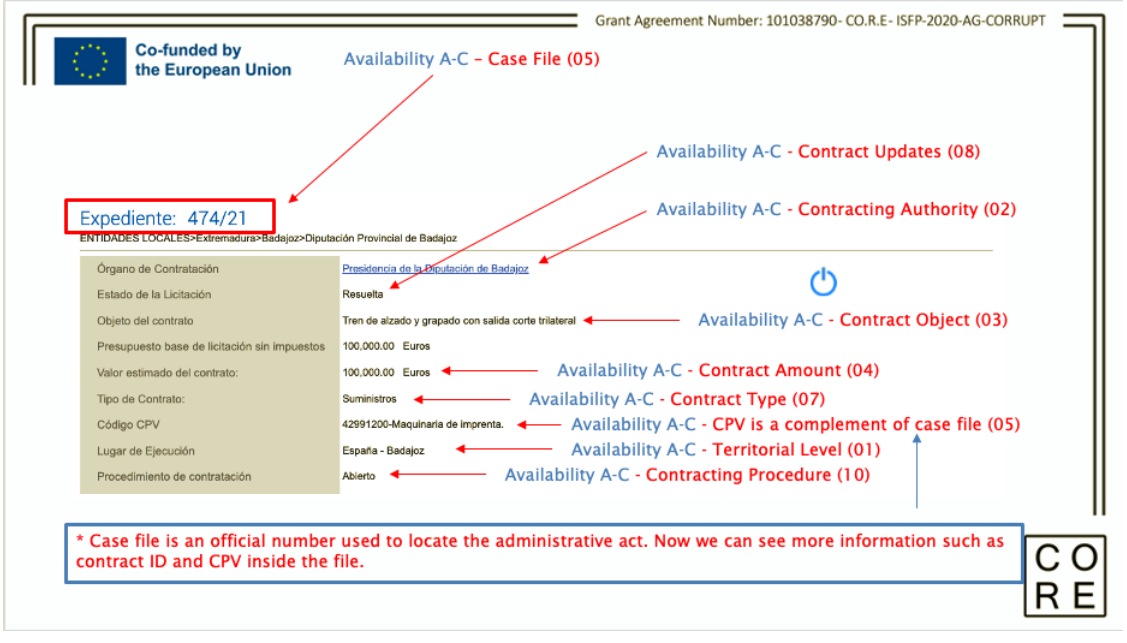


Figure 1.10: Spanish public procurement webpage

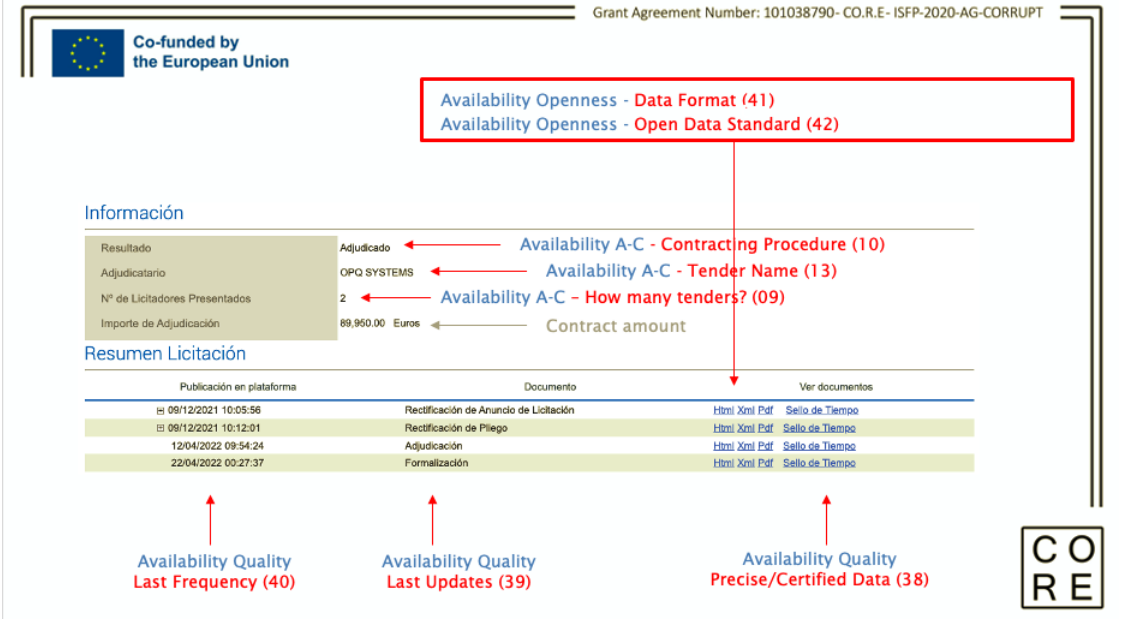


Figure 1.11: Spanish public procurement webpage

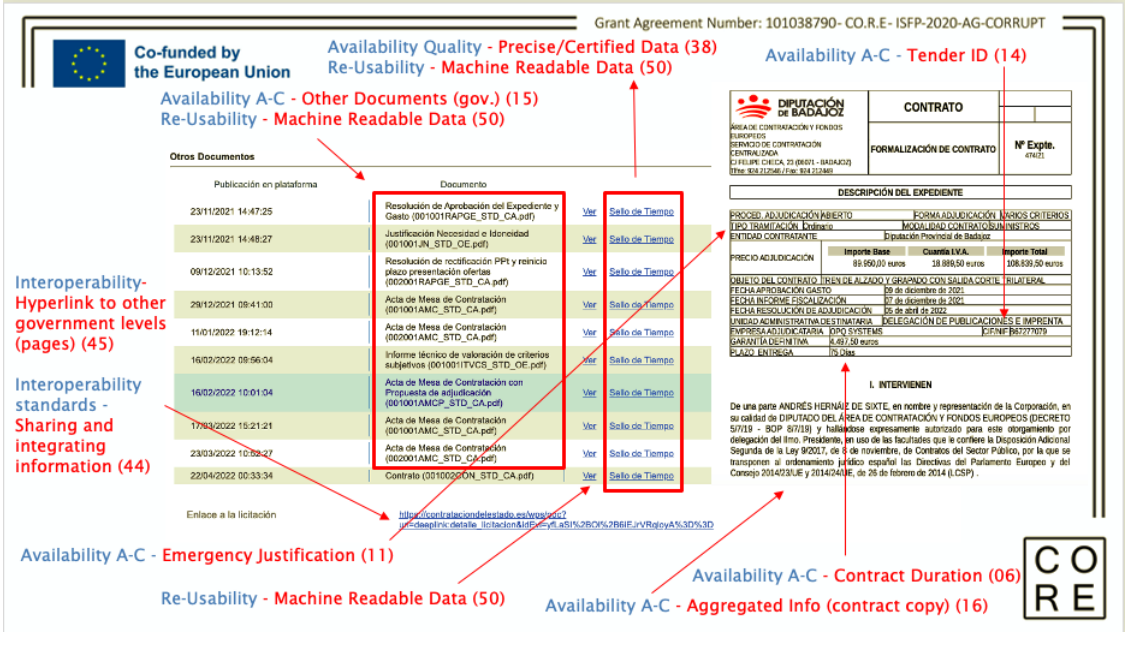


Figure 1.12: Spanish public procurement webpage

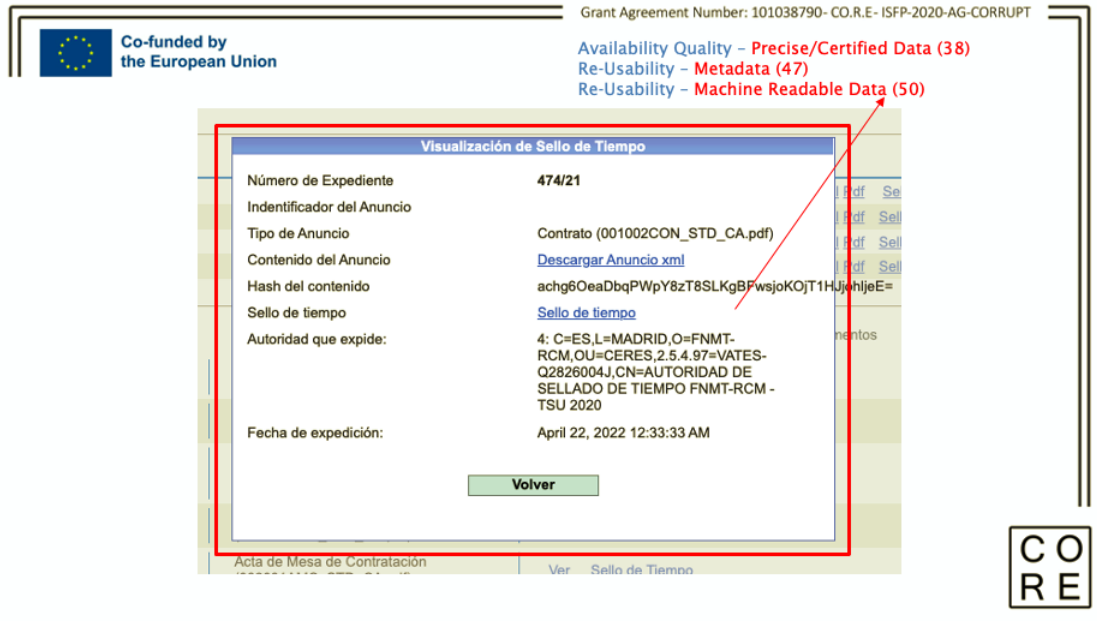


Figure 1.13: Spanish public procurement webpage

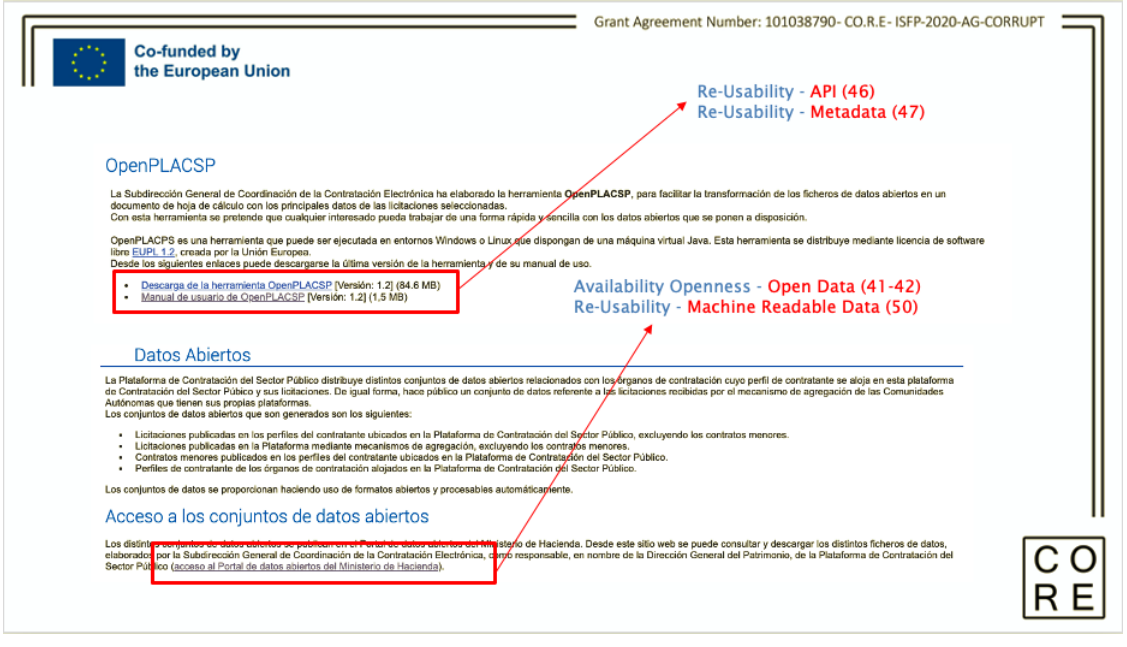


Figure 1.14: Spanish public procurement webpage

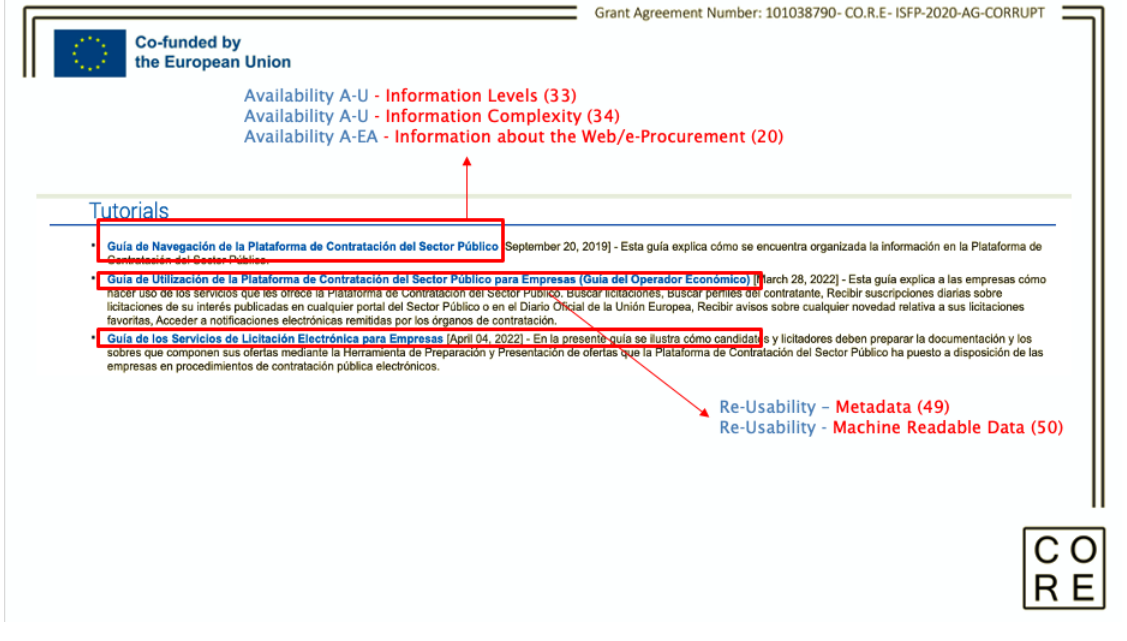


Figure 1.15: Spanish public procurement webpage

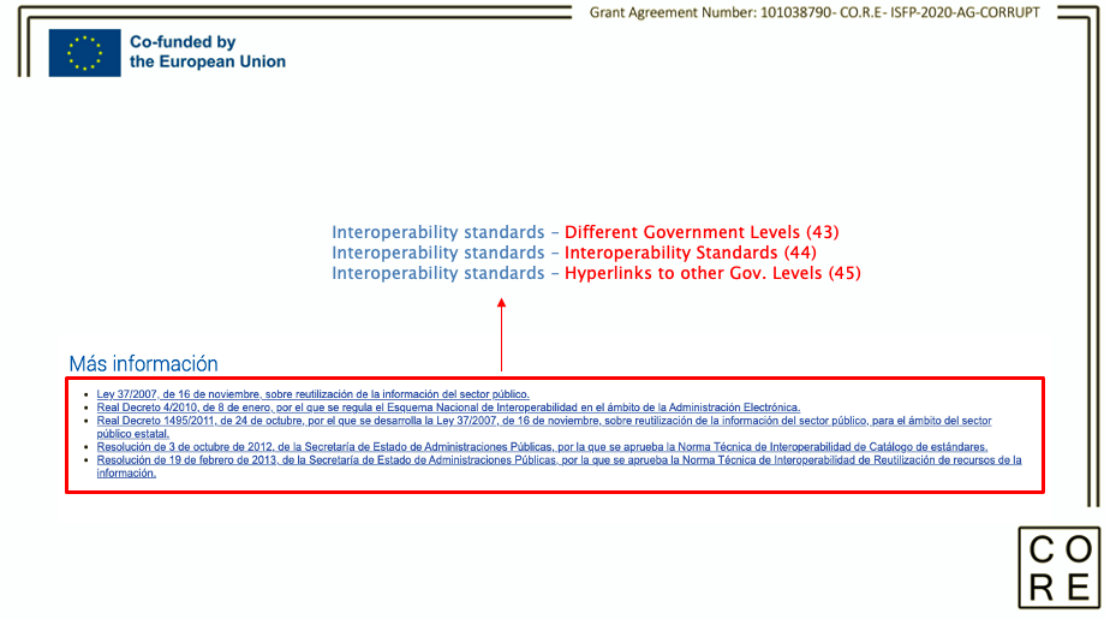


Figure 1.16: Spanish public procurement webpage

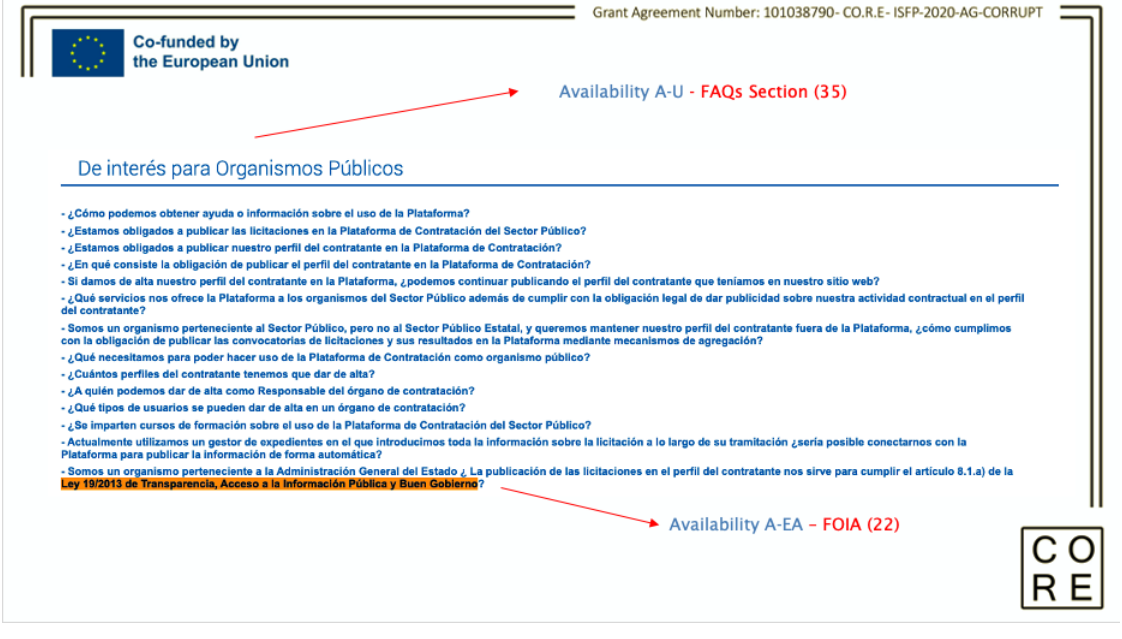


Figure 1.17: Spanish public procurement webpage

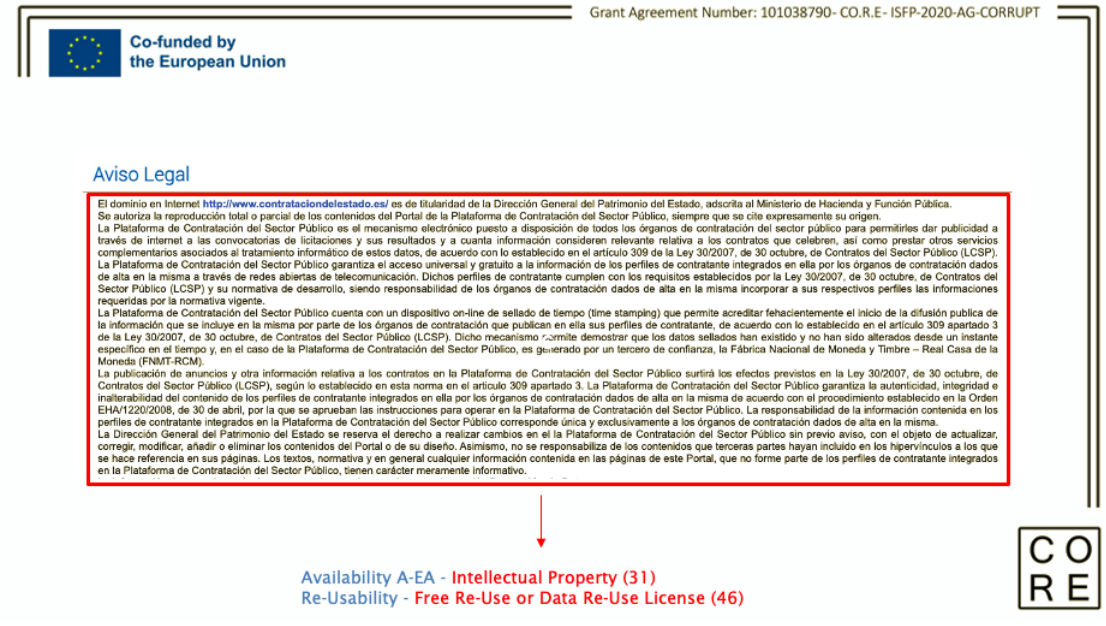


Figure 1.18: Spanish public procurement webpage

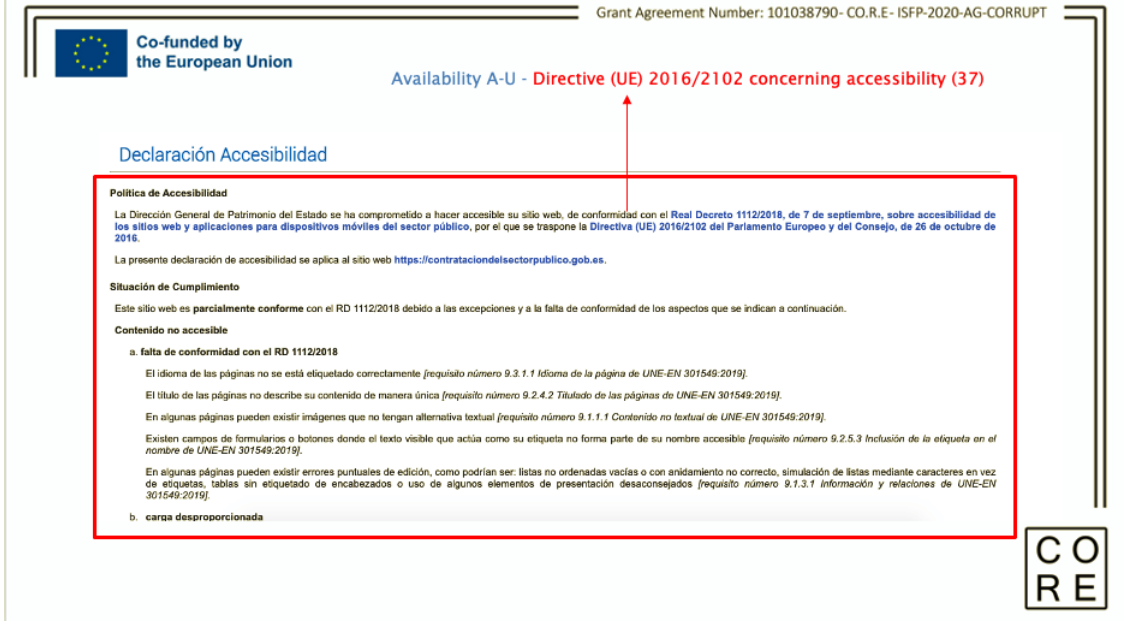


Figure 1.19: Spanish public procurement webpage

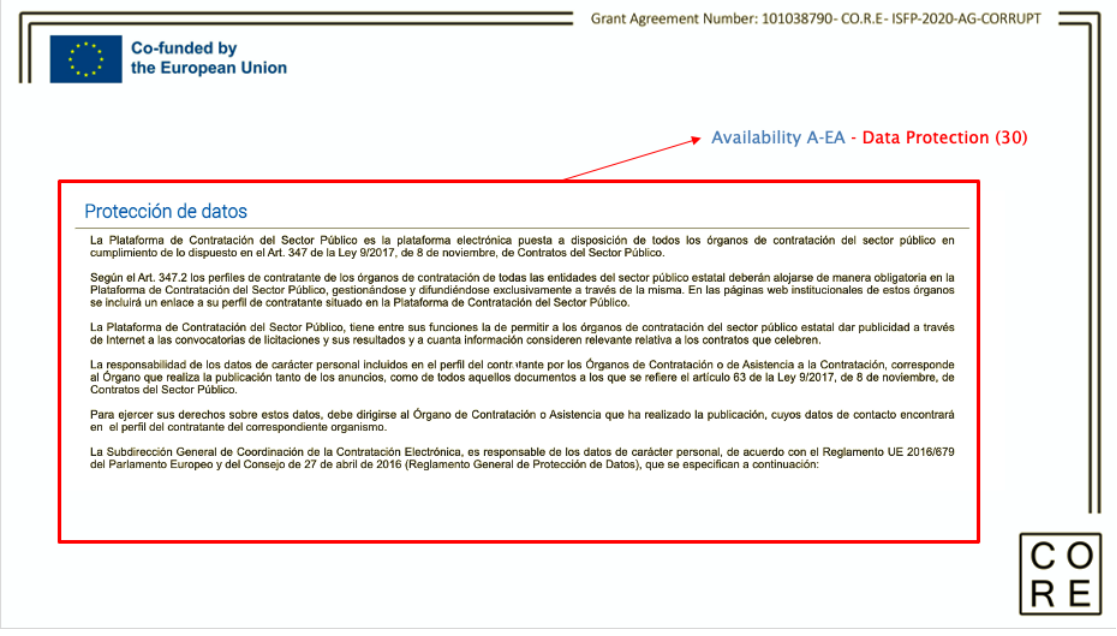


Figure 1.20: Spanish public procurement webpage

Figure 1.21: Spanish public procurement webpage

Figure 1.22: Cypriot public procurement webpage

Figure 1.23: Cypriot public procurement webpage

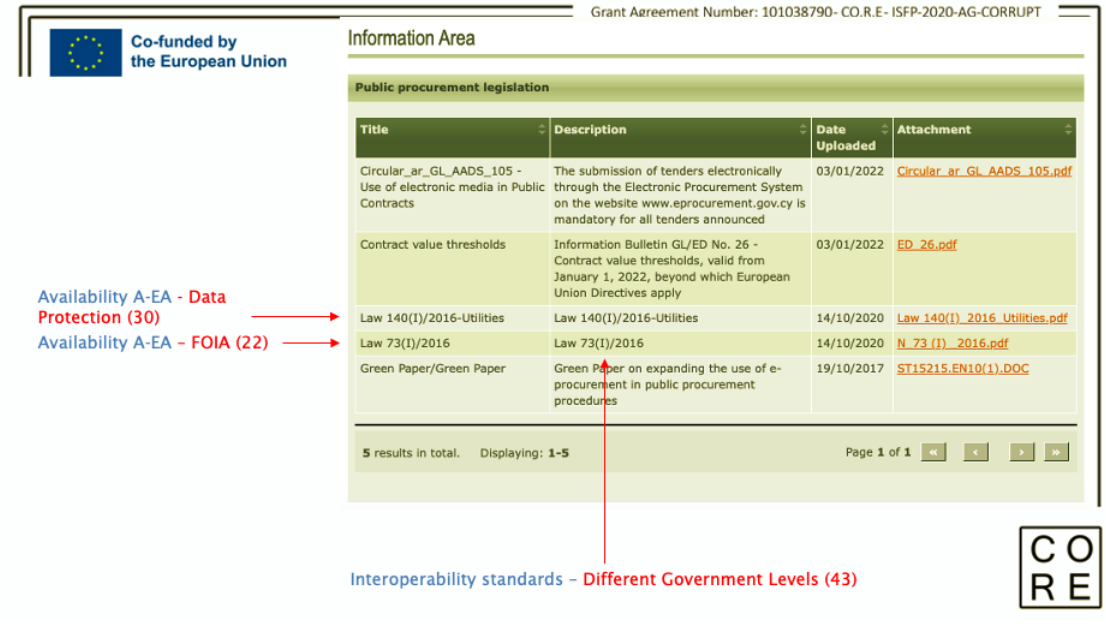


Figure 1.24: Cypriot public procurement webpage

Figure 1.25: Cypriot public procurement webpage

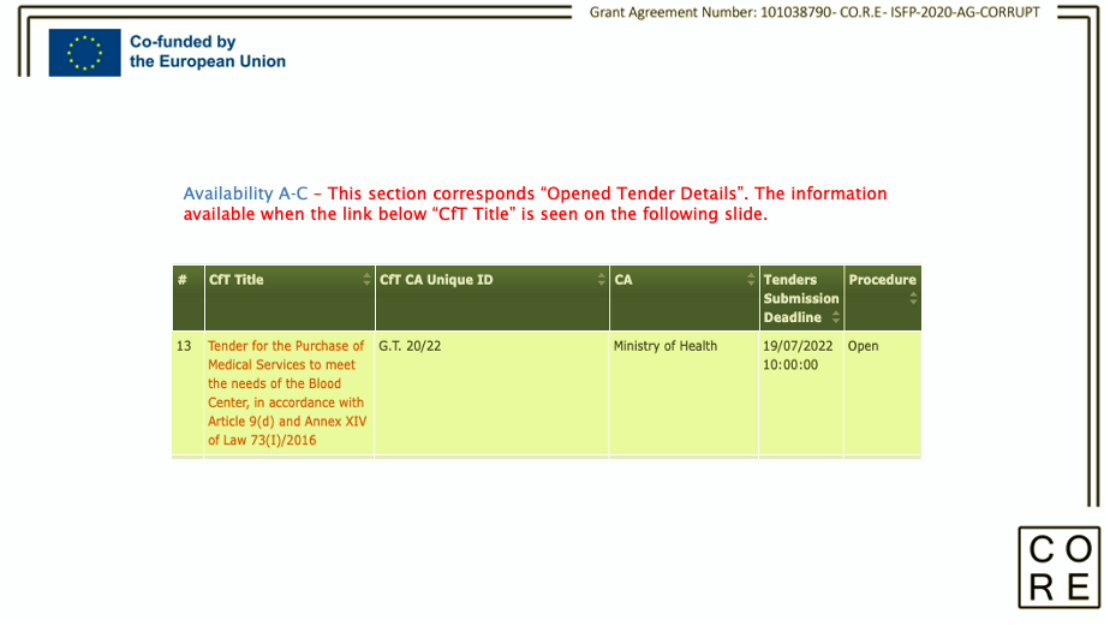


Figure 1.26: Cypriot public procurement webpage

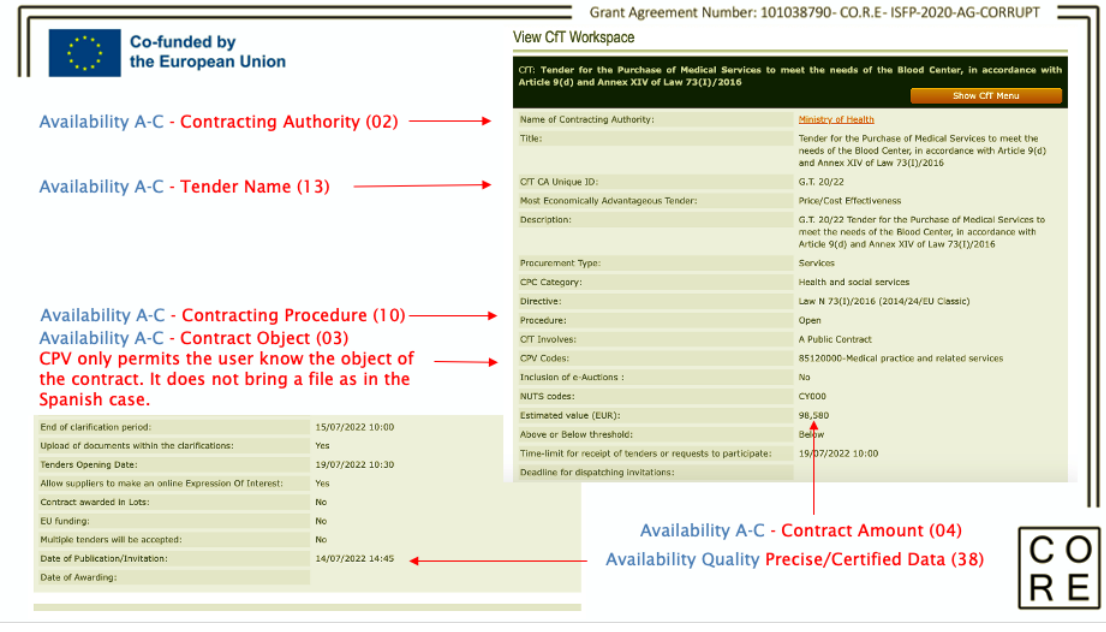


Figure 1.27: Cypriot public procurement webpage

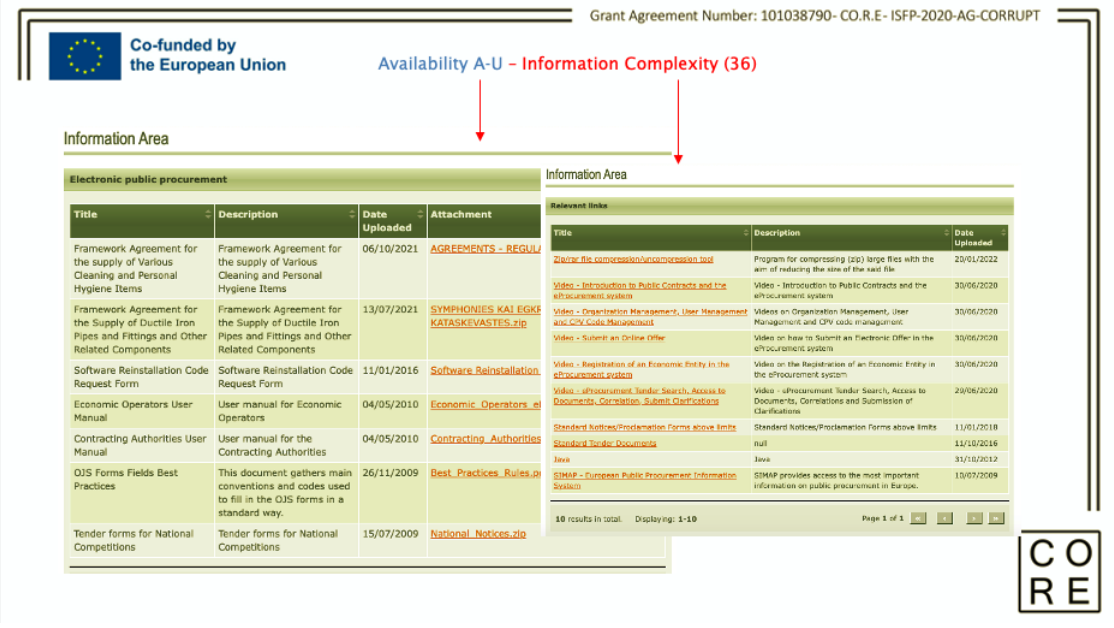


Figure 1.28: Cypriot public procurement webpage

Good Practices in Open Data

Open data and the re-use of the information on public sector is regulated by Directive (EU) 2019/1024 of the European Parliament and of the Council (European Parliament and European Council, 2019). In its point 16, open data is: "generally understood to denote data in an open format that can be freely used, re-used and shared by anyone for any purpose". Regarding the functions and features of webpages, the directive says EU member countries should provide a "wide availability and re-use of public sector information for private or commercial purposes, with minimal or no legal, technical or financial constraints, and which promote the circulation of information not only for economic operators but primarily for the public, can play an important role in promoting social engagement, and kick-start and promote the development of new services based on novel ways to combine and make use of such information". This point also refers to the protection of personal data and that data sets should not "present a risk of identifying or singling out a natural person". Other relevant issues come up, for instance, point 26 highlights that open data should be made available paying attention to the aspects or principles of "format, charging, transparency, licences, non-discrimination and prohibition of exclusive arrangements". Point 31 recognizes that "Public sector bodies are increasingly making their documents available for re-use in a proactive manner, by ensuring online discoverability and actual availability of documents and associated metadata in an open format that can be machine-readable and that ensure interoperability, re-use and accessibility". However, the collection of data and its transformation are expected to promote the use of "application programming in-

terface (API) so as to facilitate the development of internet, mobile and cloud applications based on such data".

The directive says in Point 35 that: "A document should be considered to be in a machine-readable format if it is in a file format that is structured in such a way that software applications can easily identify, recognise and extract specific data from it". Article 5 affirms that: "public sector bodies and public undertakings shall make their documents available in any pre-existing format or language and, where possible and appropriate, by electronic means, in formats that are open, machine-readable, accessible, findable and re-usable, together with their metadata. Both the format and the metadata shall, where possible, comply with formal open standards". The directive can be introduced shortly by the FAIR principle, i.e., findable, accessible, interoperable and re-usable data. It means that not only Member States should work at a national level, but from a cross-border perspective meaning that public documents should help potential re-users of information access information: "Tools that help potential re-users to find documents available for re-use and the conditions for re-use can facilitate considerably the cross-border use of public sector documents. Member States should therefore ensure that practical arrangements are in place that help re-users in their search for documents available for re-use". Having in mind emergency contracts, documents can be extensively found available and be re-used with hyperlinks connected to data catalogues on public procurement or database systems where the users can easily find the information interconnected as stated in Point 59. In this regard, article 9 of the directive also affirms: "facilitating the search for documents available for re-use, such as asset lists of main documents with relevant metadata, accessible where possible and appropriate online and in machine-readable format, and portal sites that are linked to the asset lists". Following the principles and objectives of Directive (EU) 2019/1024 of the European Parliament and of the Council (European Parliament and European Council, 2019), this section is an attempt to classify each EU's country webpages for open data on public procurement. Section 2.1 divides the overall scores in different boxes covering the constructs availability, interoperability and re-usability.

2.1 Lowest, mid-level and highest scores

A total of thirty variables are distributed in three constructs for the government open data webpages, i.e., availability, interoperability and re-usability. Twelve of them are sensitive to data on emergency contracting and the others capture general information on government open data webpages. The total amount for public procurement webpages is 38.790 in a scale 0-100 covering the data availability construct with a total of 20.415; interoperability, 6.465; and re-usability, 11.910. The following boxes, Figure 2.1 and Table 2.1 show the distribution of points and how each country scored.

Box 4. Availablity Max. 20.415

Hungary 2.835 Estonia 6.615 Cyprus 7.560 Luxembourg 8.505 Malta 8.505 Slovenia 8.505 ■ data.europa.eu: Except Hungary, Estonia and Cyprus very limited or not data on emergency contracts. Lists of economic operators selling vaccines. ■ Site Map: No site map to guide the users. ■ Last Updates and Updates Frequency: No information on last updates and updates frequency since "modified" seems to be used as a synonym for "updated". ■ Data Format: Few extensions. ■ Standard: Data emergency procurement with no open data standards at different levels. ■ Data Efficiency: Data reduced to lists or reports. ■ Data on Emergency Contracts: Incomplete data. ■ Data at Different Administrative Levels (Regions/Municipalities): Limited range of information.

Denmark 10.320 Ireland 12.210 Sweden 12.210 Greece 13.005 Belgium 14.025 ■ Site Map: No site map found. ■ Last Updates and Updates Frequency: Information on updates is found. ■ Data Format: Different types of extensions. ■ Standard: Data available on emergency shows the capacity of repeating standards for regions and local authorities. ■ Data Efficiency: Except Belgium, Ireland and Sweden, data on emergency is reduced. ■ Data on Emergency Contracts: Belgium

and Greece have functions that can be reproduced to emergency contracts different from the other countries. ■ Data at Different Administrative Levels (Regions/Municipalities): Belgium and Greece with data on public contracts at different administrative levels.

Austria 15.840 Bulgaria 15.840 Croatia 15.840 Czech Rep. 15.840 Finland 15.840 Italy 15.840 Poland 16.785 Slovakia 16.785 France 17.655 Latvia 17.655 Lithuania 17.655 Netherlands 17.655 Portugal 17.655 Romania 17.655 Germany 18.600 Spain 20.415 ■ ■ Site Map: Only Polonia, Slovakia and Spain have this feature. ■ Updates Frequency: Slovakia is behind the other countries in this aspect. ■ Data on Emergency Contracts: Spain with data on emergency contracts at different levels, but incomplete. ■ Data at Different Administrative Levels (Regions/Municipalities): Austria, Bulgaria, Croatia, Czech Republic, Finland, Italy and Poland no data on emergency.

Box 5. Interoperability Max. 6.465

Hungary 0.000 Estonia 0.000 Cyprus 0.000 Luxembourg 0.000 Malta 0.000 Slovenia 0.000 ■ No open data portals interoperable with data.europa.eu until May 2022.

Sweden 4.575 Denmark 6.465 Ireland 6.465 Greece 6.465 Belgium 6.465 Austria 6.465 Bulgaria 6.465 Croatia 6.465 Czech Rep. 6.465 Finland 6.465 Italy 6.465 Poland 6.465 Slovakia 6.465 France 6.465 Latvia 6.465 Lithuania 6.465 Netherlands 6.465 Portugal 6.465 Romania 6.465 Germany 6.465 Spain 6.465 ■ Open data portals interoperable with data.europa.eu until May 2022.

Box 6. Re-Usability Max. 11.910

Hungary 9.150 Estonia 9.150 Cyprus 9.150 Germany 9.150 Luxembourg 9.150 Downloadable and Easy to Mine: Different formats and extension would facilitate the re-usability of data. eInvoicing Verified (EU): None of the these countries verified the eInvoicing system. That compromises both interoperability and re-usability of data in EU.

Malta 10.020 Slovenia 10.020 Downloadable and Easy to Mine: Different formats and extension would facilitate the re-usability of data. API: Different formats and extension would facilitate the re-usability of data via APIs.

Bulgaria 10.095 Czech Rep. 10.095 France 10.095 Latvia 10.095 Lithuania 10.095 Portugal 10.095 Austria 10.965 Denmark 10.965 Finland 10.965 Greece 10.965 Ireland 10.965 Italy 10.965 Poland 10.965 Slovakia 10.965 Sweden 10.965 eInvoicing Verified (EU): Bulgaria, Czech Republic, France, Latvia, Lithuania and Portugal showed no eInvoicing verification. Downloadable and Easy to Mine: Data not easily downloadable in the cases of Austria, Denmark, Finland, Greece, Ireland, Italy, Poland, Slovakia, and Sweden.

Belgium 11.910 Croatia 11.910 Netherlands 11.910 Romania 11.910 Spain 11.910 These countries have shown that they are able to make data on emergency contracts re-usable. The challenge is to enhance the use of both government open data portal and data.europa.eu. Although we analyzed the capacity of the EU countries to deliver services, it does not mean these countries have complete data series covering either all the regional or the local authorities.[a]

[a] The three constructs discussed in this section will be subdivided into twelve parts, so all the variables can be classified accordingly for both public procurement webpages and government open data portals. See chapter 6.

Figure 2.1 shows how countries like Hungary, Estonia, Cyprus, Luxembourg, Malta, and Slovenia have scored less than the other countries since their respective government open data webpages were not sharing or integrating data on public contracts with data.europa.eu. In short, these countries have been far behind the others due to the difficulty of finding data on public contracts especially during emergency times without catalogues on public procurement data published by channels of the European Union. Based on what affirms Directive (EU) 2019/1024 of the European Parliament and of the Council (European Parliament and European Council, 2019), interoperability is one of the essential tools to boost the re-use of data and promote more transparency in public administration. Table 2.1 shows the outputs for the three constructs that will be summed up with the outputs of the webpages to generate the SCO.R.E. outputs.

Figure 2.1: Distribution of the outputs for government open data webpages

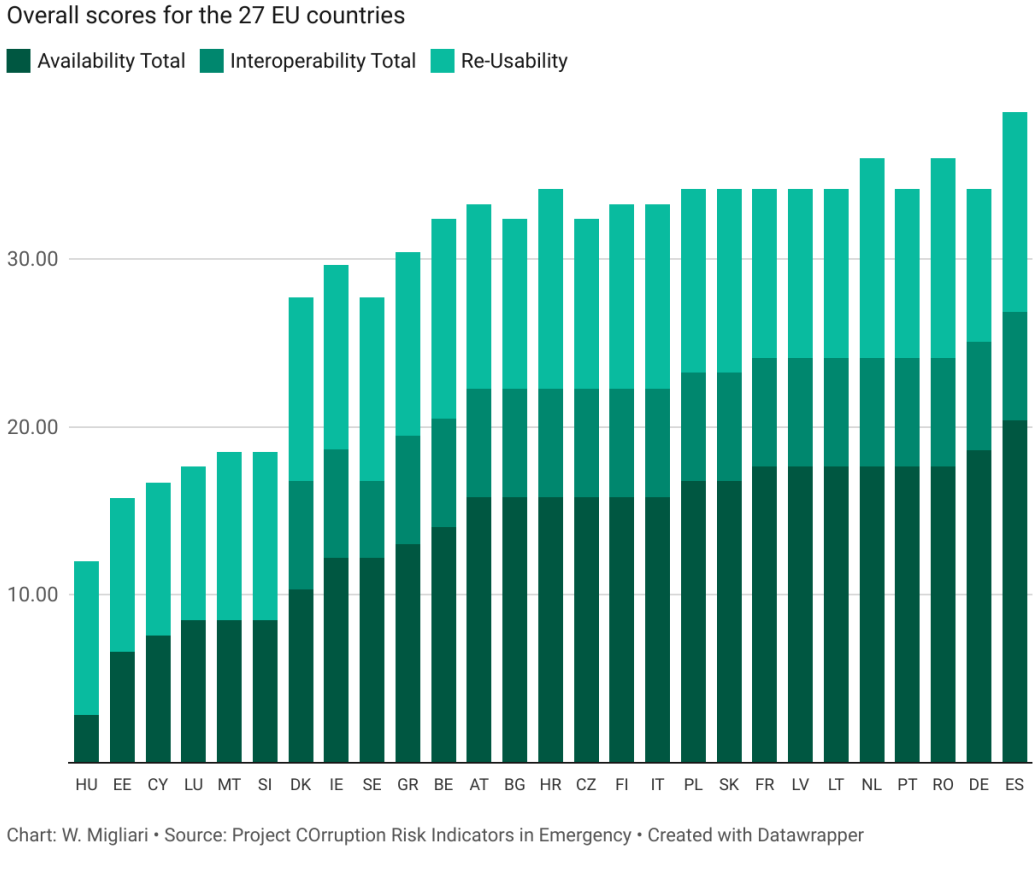


Table 2.1: Scores for data availability, interoperability and re-usability on government open data webpages in the EU

Country	Availability Total	Interoperability Total	Re-Usability	Total
	Max. 20.415	Max. 6.465	Max. 11.910	Max. 38.790
Hungary	2.835	0.000	9.150	11.985
Estonia	6.615	0.000	9.150	15.765
Cyprus	7.560	0.000	9.150	16.710
Luxembourg	8.505	0.000	9.150	17.655
Malta	8.505	0.000	10.020	18.525
Slovenia	8.505	0.000	10.020	18.525
Denmark	10.320	6.465	10.965	27.750
Sweden	12.210	4.575	10.965	27.750
Ireland	12.210	6.465	10.965	29.640
Greece	13.005	6.465	10.965	30.435
Belgium	14.025	6.465	11.910	32.400
Bulgaria	15.840	6.465	10.095	32.400
Czech Rep.	15.840	6.465	10.095	32.400
Austria	15.840	6.465	10.965	33.270
Finland	15.840	6.465	10.965	33.270
Italy	15.840	6.465	10.965	33.270
Croatia	15.840	6.465	11.910	34.215
Poland	16.785	6.465	10.965	34.215
Slovakia	16.785	6.465	10.965	34.215
France	17.655	6.465	10.095	34.215
Latvia	17.655	6.465	10.095	34.215
Lithuania	17.655	6.465	10.095	34.215
Portugal	17.655	6.465	10.095	34.215
Netherlands	17.655	6.465	11.910	36.030
Romania	17.655	6.465	11.910	36.030
Germany	18.600	6.465	9.150	34.215
Spain	20.415	6.465	11.910	38.790

Figure 2.2 illustrates the total of points for each country concerning government open data webpages. It is interesting that Italy, Croatia, Poland, Slovakia, Latvia, Lithuania, Portugal, Romania and Spain, countries usually perceived as less transparent in public matters, have shown government open data webpages with strong functions and features to reduce drastically opacity. That sort of debate puts us in a position to discuss what we consider the two sides of the same coin, that is, evidence we found in public procurement or government open data webpages and perception of corruption. In chapter 4, we will evolve this topic making commenting on some indicators.

Figure 2.2: Scores for government open data webpages in the EU

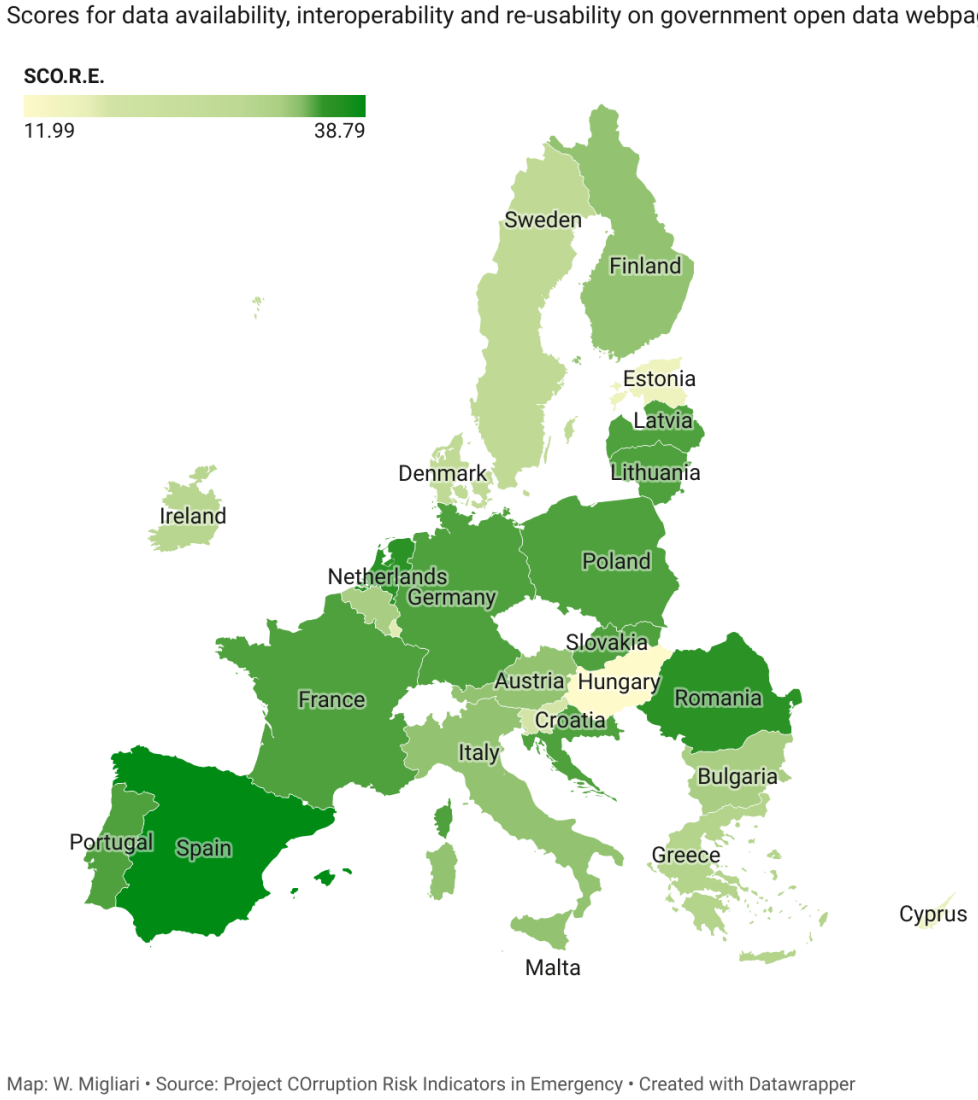


Figure 2.3: Scores for government open data webpages in the EU

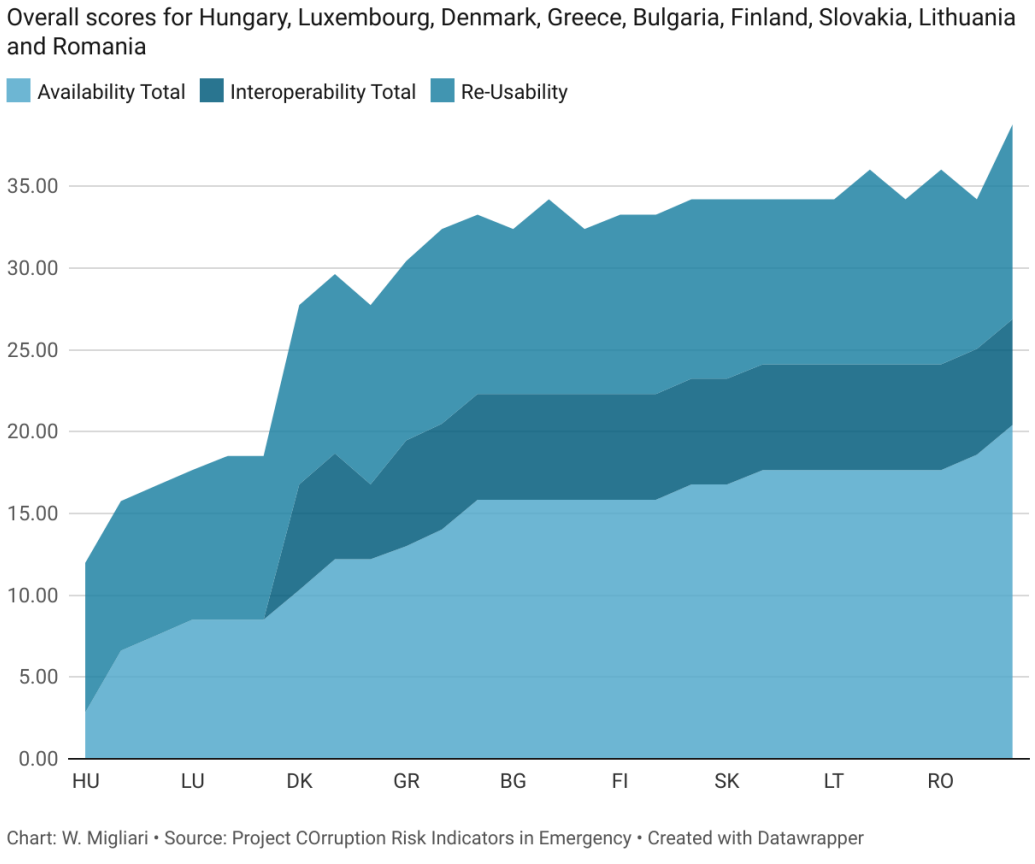


Figure 2.3 shows the outputs for those countries scoring less. We notice that Hungary and Luxembourg could promote more transparency in public administration by simply using more the functions and features already available on the data.europa.eu portal.[1]

2.2 Distribution of points in two case studies

Figures 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, and 2.11 systematize the information on functions and features which were found on the Spanish open data webpage in connection with data.europa.eu portal based on the constructs aforementioned, i.e., availability, interoperability and re-usability. Figures 2.12, 2.13, 2.14, 2.15, and 2.16 give examples how we selected and collected the

[1] Luxembourg has recently included in its catalogue on data.europa.eu interoperable data with its government open data webpage. The collection of data for the present research was concluded in May 2022. Maybe the next version of this study will show a more updated analysis for the country.

data on the Cypriot open data webpage analyzing how far the data on public contracts was also available, interoperable and re-usable on data.europa.eu.

Figure 2.4: Spanish government open data webpage and data.europa.eu

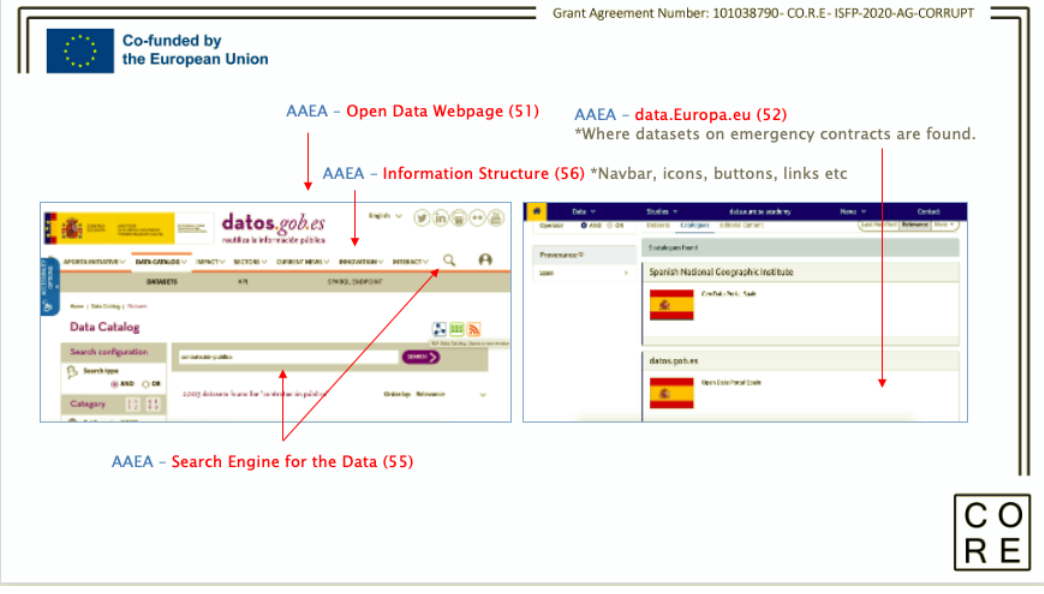


Figure 2.5: Spanish government open data webpage and data.europa.eu

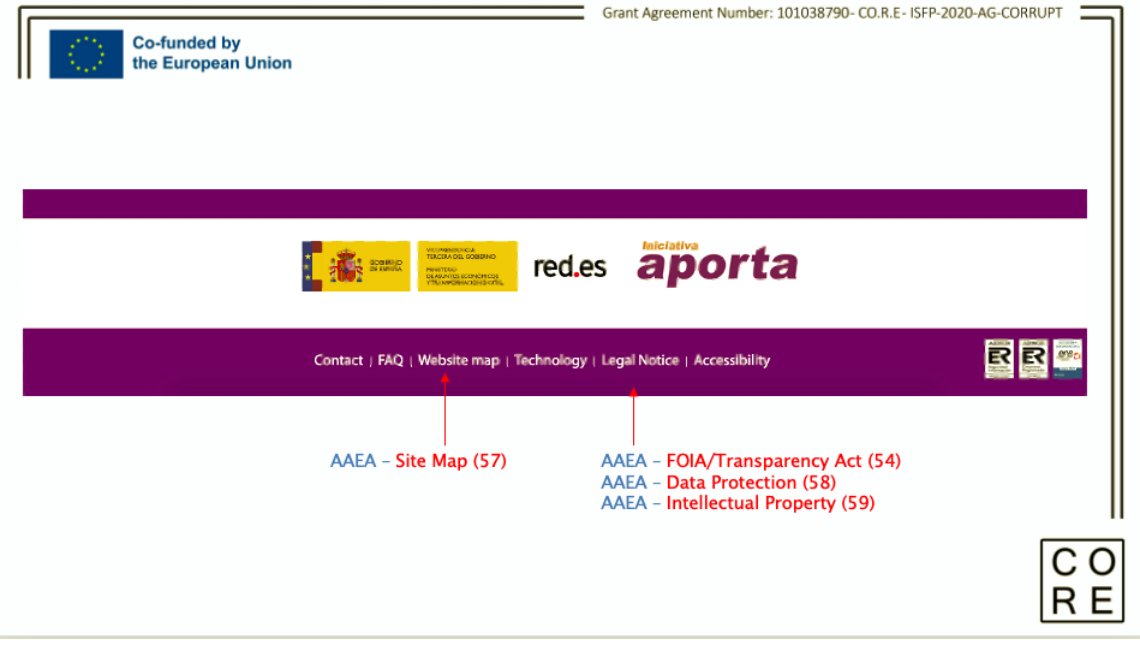


Figure 2.6: Spanish government open data webpage and data.europa.eu

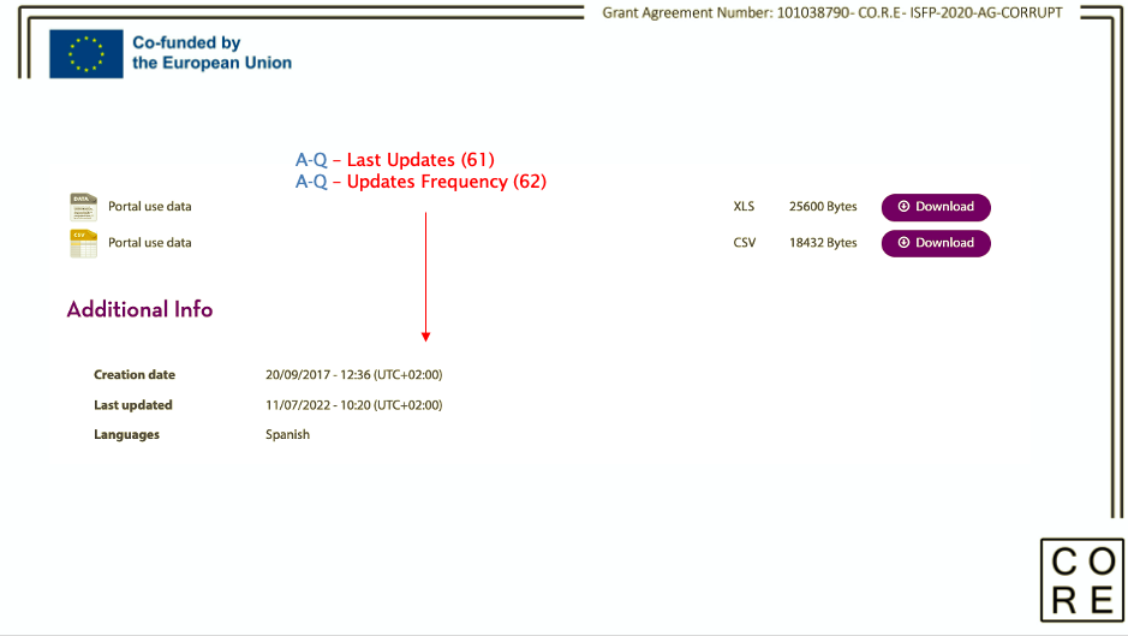


Figure 2.7: Spanish government open data webpage and data.europa.eu

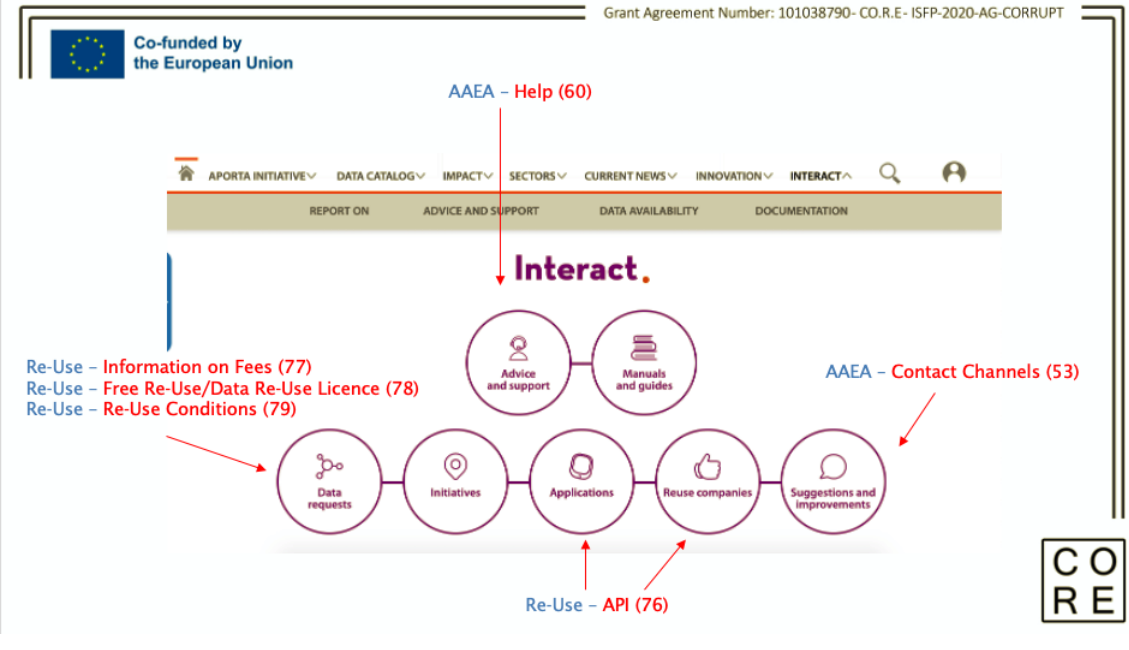


Figure 2.8: Spanish government open data webpage and data.europa.eu

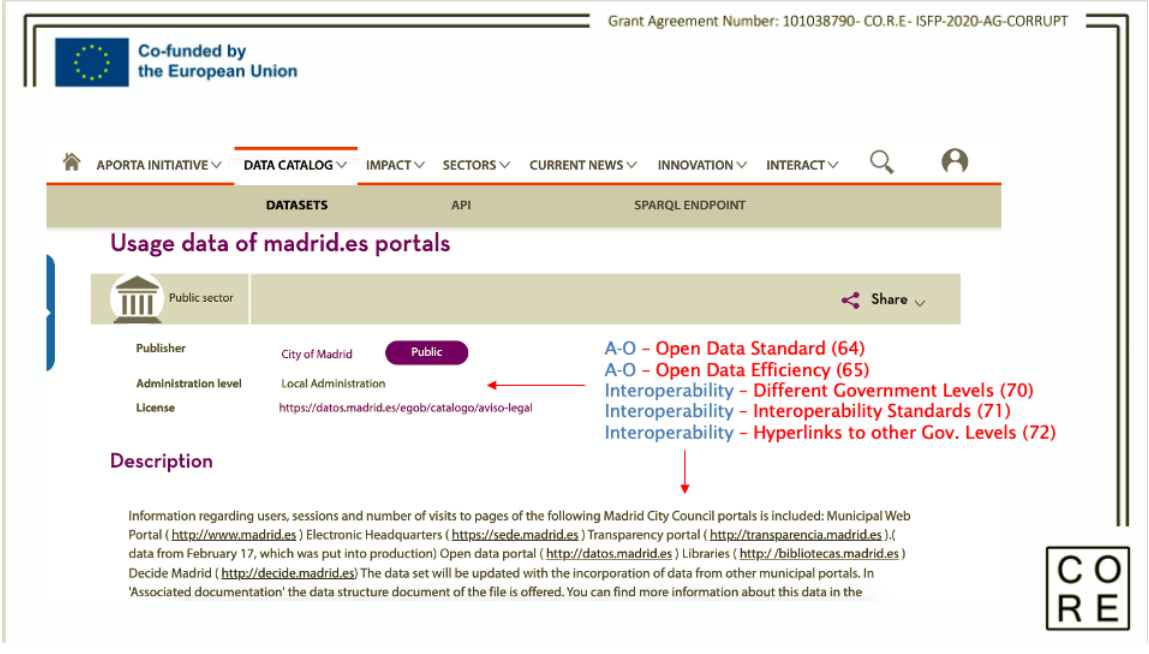


Figure 2.9: Spanish government open data webpage and data.europa.eu

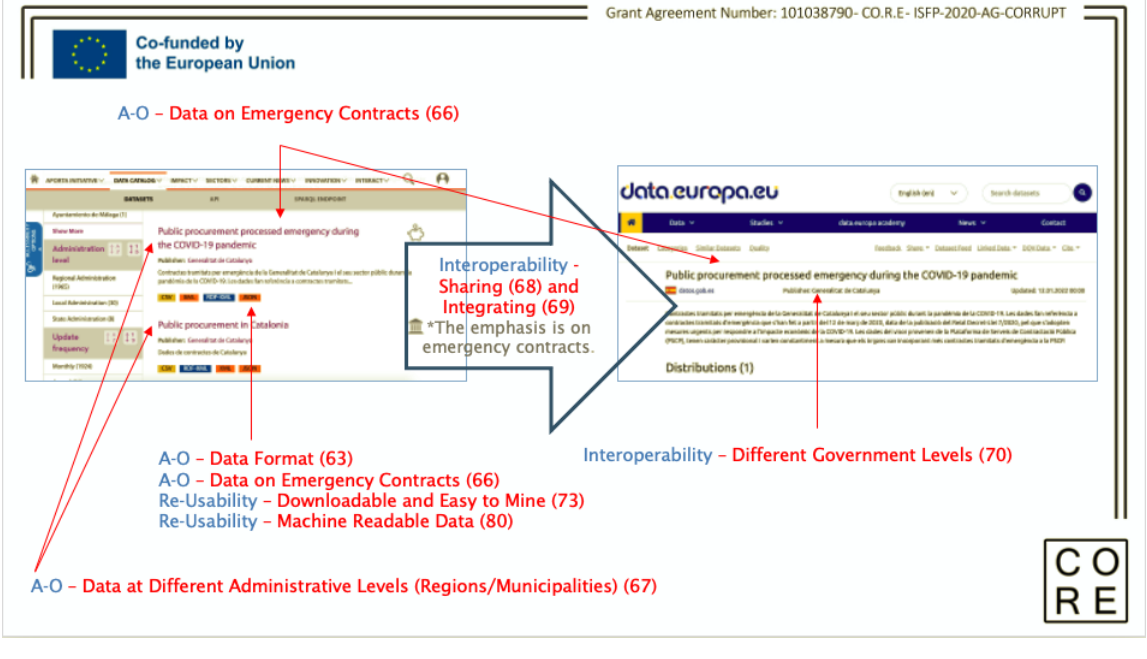


Figure 2.10: Spanish government open data webpage and data.europa.eu

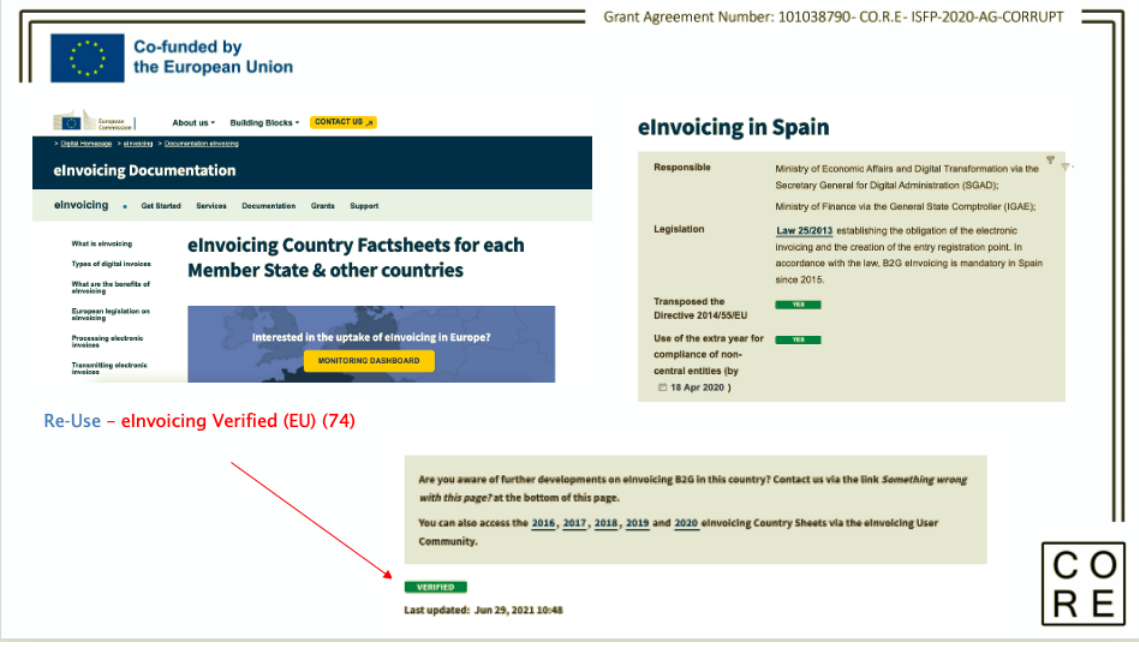


Figure 2.11: Spanish government open data webpage and data.europa.eu

Figure 2.12: Cypriot government open data webpage and data.europa.eu

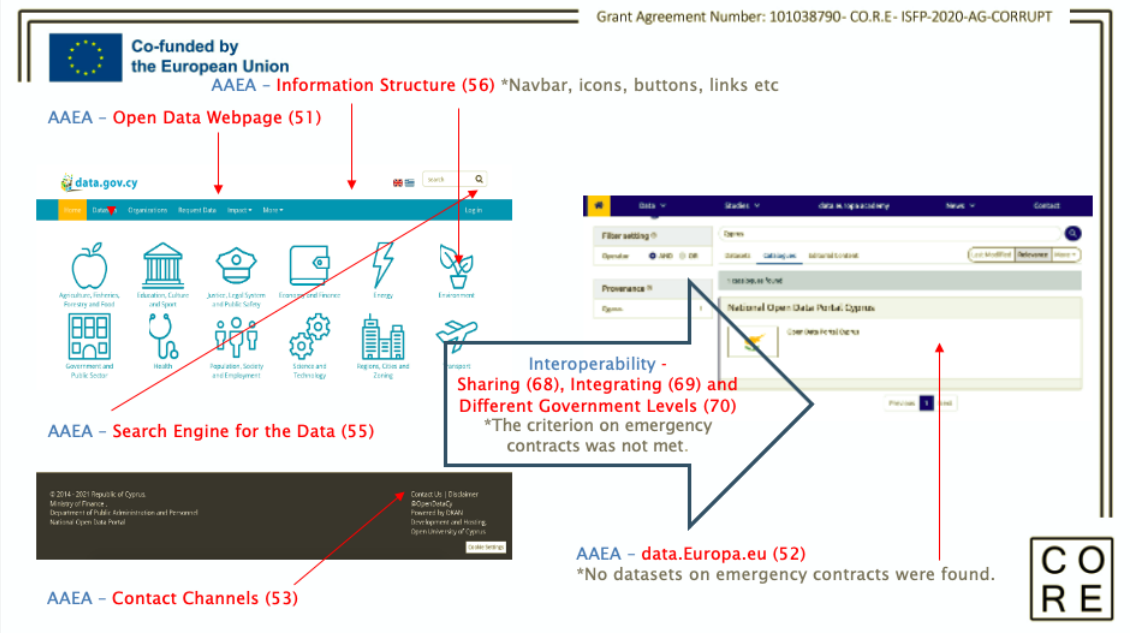


Figure 2.13: Cypriot government open data webpage and data.europa.eu

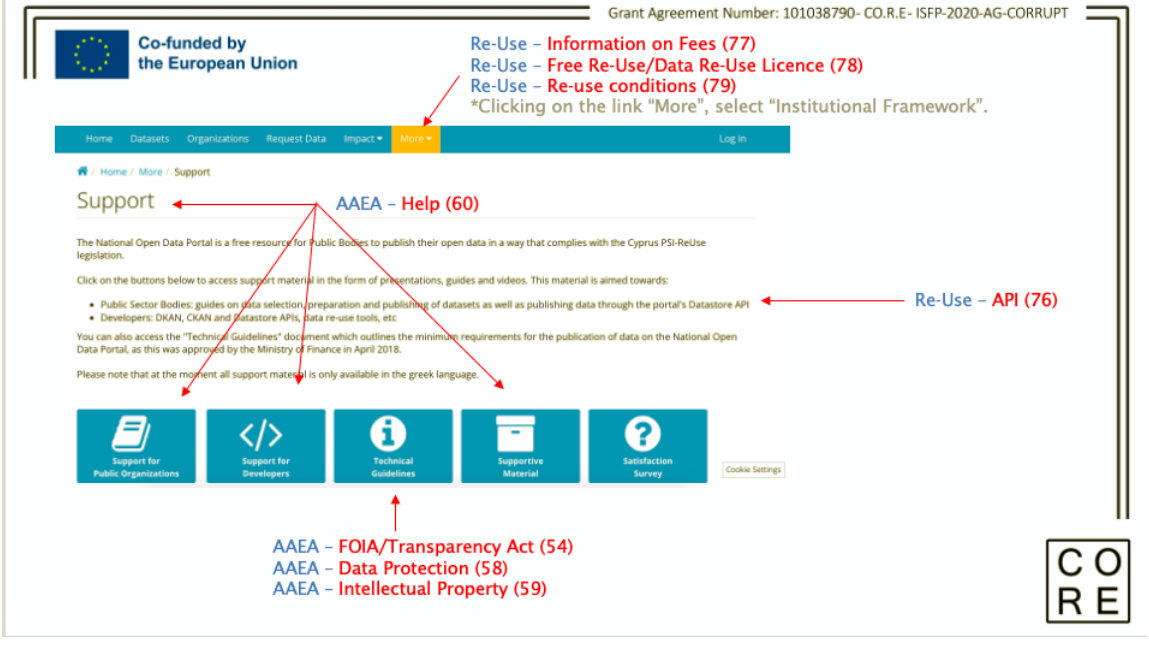


Figure 2.14: Cypriot government open data webpage and data.europa.eu

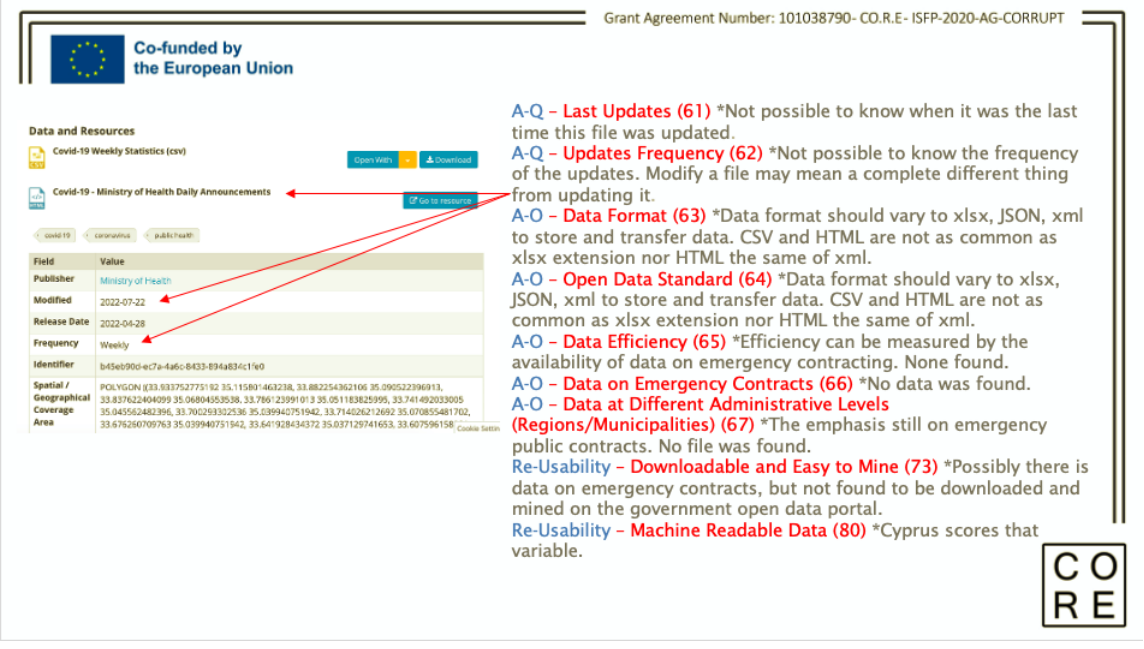


Figure 2.15: Cypriot government open data webpage and data.europa.eu

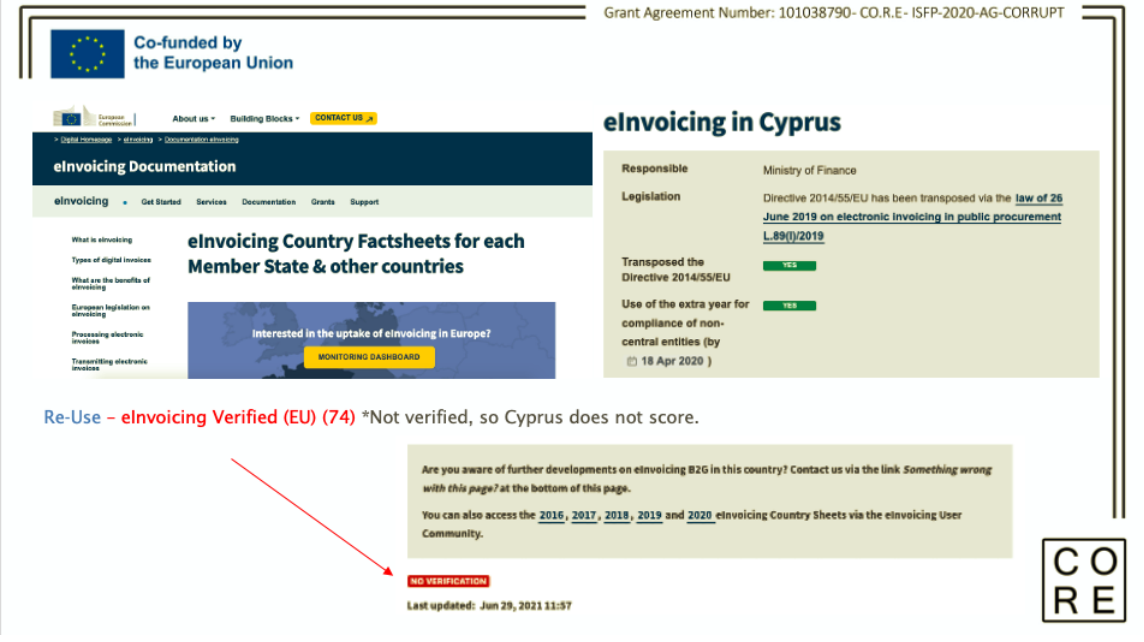
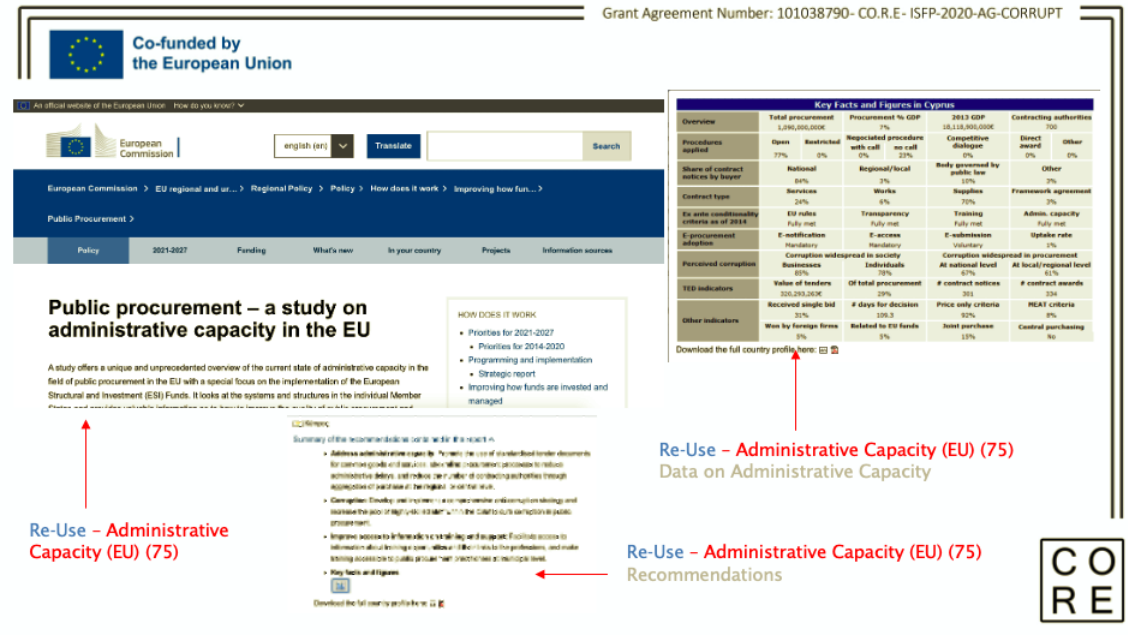


Figure 2.16: Cypriot government open data webpage and data.europa.eu



Synthesis for the SCO.R.E.

Regarding public procurement webpages, the SCO.R.E. collects data and assesses: ■ those good practices related to public procurement webpages; ■ those functions and features on public procurement webpages which may promote more data availability if fully employed; ■ those functions and features on public procurement webpages which may promote more data interoperability if fully employed; ■ those functions and features on public procurement webpages which may promote more data re-usability if fully employed; ■ those functions and features on public procurement webpages which may promote more data availability, interoperability and re-usability for times of emergency if fully employed.

Synthesis of Constructs and Variables for Public Procurement Webpages

Constructs: Availability; Interoperability; and Re-usability.

Constructs and Variables:

■ Availability with a total of 42 variables → 30 general variables and 12 sensitive variables; ■ Interoperability with a total of 3 variables → 1 general variable and 2 sensitive variables; ■ Re-usability with a total of 5 variables → 3 general variables and 2 sensitive variables.

Synthesis of Constructs and Variables for Open Data Government Open Data Webpages

Constructs: Availability; Interoperability; and Re-usability.

Constructs and Variables:

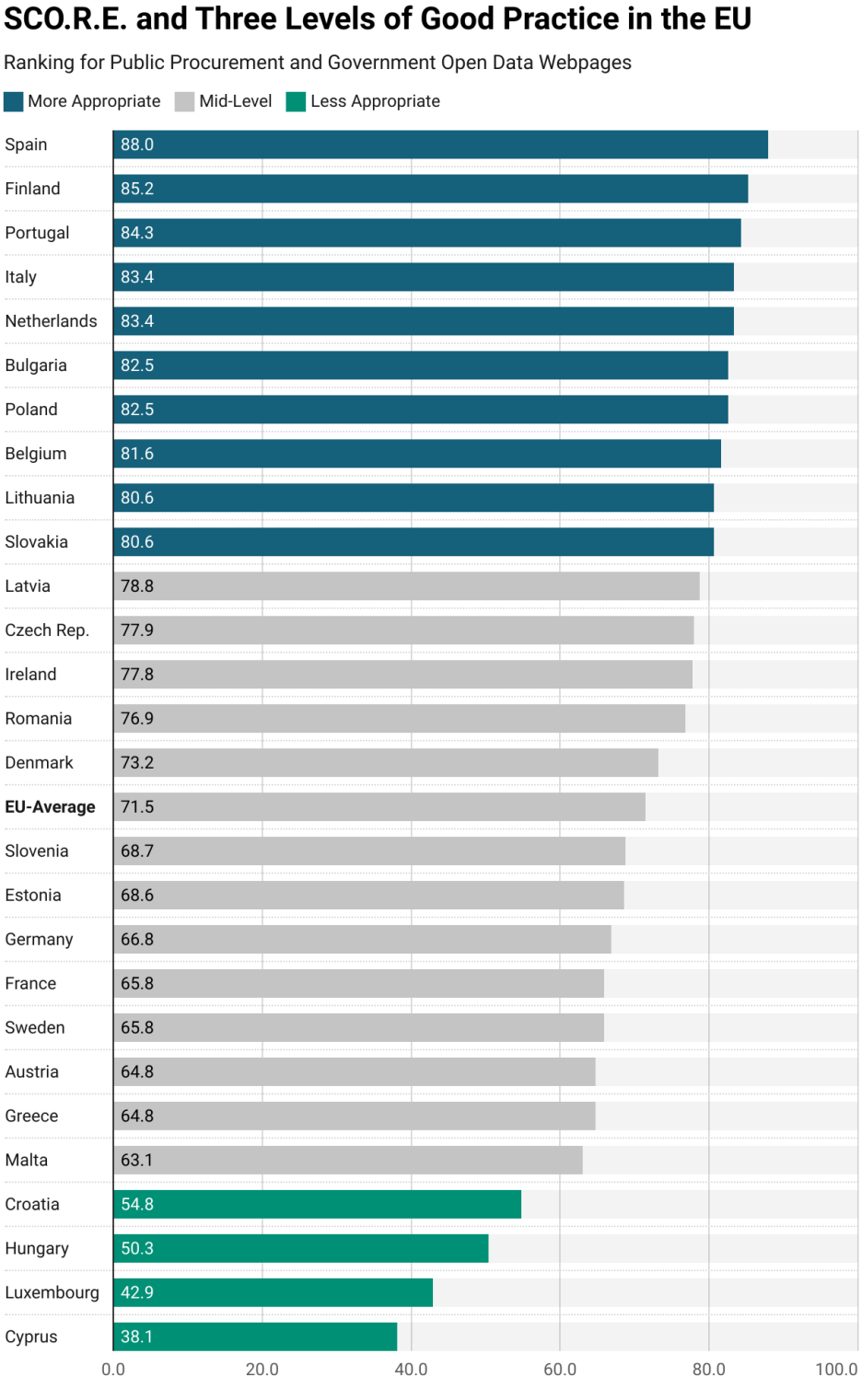
■ Availability with a total of 17 variables → 12 general variables and 5 sensitive variables; ■ Interoperability with a total of 5 variables → 3 general variable and 2 sensitive variables; ■ Re-usability with a total of 8 variables → 3 general variables and 5 sensitive variables.

The electronic availability of information and documents related to public procurement has become a legal requirement after Directive 2014/24/EU was passed. Article 53.1 says: "contracting authorities shall by electronic means offer unrestricted and full direct access free of charge to the procurement documents from the date of publication of a notice in accordance with Article 51 or the date on which an invitation to confirm interest was sent. The text of the notice or the invitation to confirm interest shall specify the internet address at which the procurement documents are accessible". Furthermore, article 23.1 of the same directive states that the nomenclatures for public procurement in the EU should be framed by the Common Procurement Vocabulary (CPV) as we read in Regulation (EC) No 2195/2002. Based on Point 129 of Directive 2014/24/EU, these nomenclatures refer to a detailed categorization of goods and services offering a standardized classification for both public contracting authorities and economic operators. By electronic means of communication, it is implied centralized purchasing practices and instruments creating the possibility:

"to re-use and automatically process data and to minimise information and transaction costs. The use of such electronic means of communication should therefore, as a first step, be rendered compulsory for central purchasing bodies, while also facilitating converging practices across the Union" according to point 72 of Directive 2014/24/EU. Additionally, the parameters of the SCO.R.E. embed the notion of electronic means of communication framed by Directive 2014/24/EU.

Our score reflects the legal traits of availability, interoperability and re-usability of data set up by Directive 2014/24/EU before assessing the government open data webpages of the 27 EU countries. One of the questions posed by the research project COrruption Risk indicators in Emergency (CO.R.E) is whether the functions and the features on public procurement and government open data webpages may result in more transparent public contracting in the EU if fully employed. Another one is whether public procurement portals for the EU Member States, such as data.europa.eu, could be a reference in a way the outputs of such analysis are quantified as more objectively as possible. The short answer for both primary inquiries is affirmative. Before analyzing the public procurement webpages of the EU countries, constructs and variables were built up relying on the possibility of checking how far the public procurement and government open data webpages were able to make data on public contracting available, interoperable and re-usable. In general, it is known that collected information about functions and features of the digital platforms gives us the capacity of strengthening data availability, interoperability and re-usability in public contracting. In **chapters 6 and 7**, the overall dataset is disaggregated, described and after submitted to a data quality model. Henceforth, we suggest that the use of the phrase **if fully employed** in Synthesis for the SCO.R.E. means a function already under use on a webpage. The same applies to the features through information on emergency contracts. Figure 2.17 presents the overall results for public procurement and government open data webpages in the EU.

Figure 2.17: More, mid-level and less appropriate good practices



Civil Society Initiatives

Civil society initiatives are doorways to enhance integrity and transparency in public administration. The state of emergency caused by the COVID-19 pandemic shut down competition in public procurement worldwide. In Europe, the case was not different. Therefore, the production of data on public procurement particularly for extraordinary contracting helps us compare, price levels, pin down economic operators and understand market failures such as productive and allocative inefficiency, monopoly or oligopoly formation, missing or incomplete markets, de-merit goods among other negative externalities. The civil society initiatives referred in this chapter correspond to those civil society or non-governmental organizations dedicated to the fight against corruption. They do not necessarily assess data on public procurement, but all of them have as principle more integrity in public administration through the availability of information on public contracting. Some of them go beyond and have contributed to the development of APIs, studies and arrangements of good governance as we will see. It is also important to highlight that we have pointed out Transparency International as the most present international initiative in all countries of the EU except Cyprus and Poland where no project was found. The most interesting aspect in all its projects is the absence of long-term plans to examine public procurement webpages or open data government portals as a tool to combat corruption or as a way to freedom of expression. Since public contracting tends to be more digital in the EU, why not investing time in ameliorating the mechanisms of transparency through the know-how accumulated during and after the COVID-19 pandemic? According to Open Contract-

ing Partnership , the chase for life saving equipment led all EU countries to reduce transparency in public procurement at different levels: "The Czech government, as any other government in Europe at the time, came under immense pressure to procure COVID-19 related equipment. Czech ministers, all wearing a bright red sweater, awarded multiple contracts for more than €23 million worth of FFP2 respirator masks without competition. But instead of respirators with 95% particle filtration capacity, Czech hospital personnel received plain surgical masks with no filtration capacity at all. At €0.20 per respirator it initially seemed like a good deal. Incidentally – the same government also bought FFP2 respirators for €37 per piece – perhaps to be sure they are the right kind" (Open Contracting Partnership, 2021). The demand for respirator masks, ventilators, and protective equipment created an anomalous situation: "Instead of companies competing to supply the government, governments competed against each other. In order to buy fast, governments were awarding contracts directly. In a competitive market, it would probably have become clear that 20 cents was probably just too good of a deal for an FFP2 respirator". During 2020, Open Contracting Partnership identified that "Lithuania, Portugal, and Slovenia were also publishing COVID-19 related procurement. Some even including the price per unit of equipment, however, Belgium, the Netherlands or Denmark did not publish any of their pandemic buying and refuse to do so until this day. Similarly, the European Commission has been reluctant to release all documents related to procurements worth a couple of billion Euro after our FOIA request that took them 6 months to complete" (Open Contracting Partnership, 2021). The following references facilitate objective information on those civil society initiatives for every country in the European Union. They are not exhaustive, but an attempt to name some of them with the purpose of reinforcing our first argument on availability, interoperability and re-usability of data. In short, the information on public contracting reflects how the functions and features of the public procurement and government open data webpages work in practice. We are not checking whether the data on public contracting is complete at national, regional and local level. In this chapter, our goal is to show how civil society initiatives can have access to more information as a consequence of functions and features of public procurement and government open data webpages disseminating more precise information on public con-

tract amounts, scrutinizing economic operators and informing public opinion.

In Austria, the initiative Offene Vergaben has the mission to make public contracts over 50,000 euros come to light. The platform works specifically on public procurement data and has no funding from the European Union. As Offene Vergaben, Transparency International in Austria has conducted research on the perception of corruption, but also incentivized academia, private sector, news media and citizenship to collaborate, for instance, with studies or opinions on the 2015 Freedom of Information Act, projects and whistleblowing working groups (Transparency International in Austria, 2022). These initiatives seem to be very appropriate since, as mentioned before, the availability of data on public procurement has been compromised in Austria due to the access restrictions that are still present in its public procurement webpage.

Civil Society Initiatives

Austria

Offene Vergaben

- Main goal: Make public sector contracts over 50,000 euros transparent.
- Specifically on public procurement: Yes.
- Funds provided by the EU/European Commission or European Parliament: No information found.
- Webpage: Offene Vergaben

Transparency International in Austria

- Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Austria.
- Specifically on public procurement: No.
- Funds provided by the EU/European Commission or European Parliament: No information found.
- Webpage: Transparency International in Austria

We call the attention to two active initiatives for transparency in Belgium. One of them has a broad view on institutions and on the promotion on integrity in public administration. Re-Bel Initiative focuses on what is defined as minor occurrences of corruption:"While most people condemn it, many consider (minor) occurrences of corruption as inevitable. Likewise,

while evidence shows that corruption harms competitiveness and growth and a number of indicators point to the underperformance of Belgium in the fight against corruption, the current government agreement does not contain any mention of anti-corruption measures, despite a first chapter devoted to competitiveness and employment" (Re-Bel Initiative, 2015). The other civil society initiative is promoted by Transparency International in Belgium with some interesting activities like ethics in the banking system and in politics as well as a forum devoted to the debate of integrity in public affairs, accountability and whistleblowing (Transparency International in Belgium, 2022).

Civil Society Initiatives

Belgium

Re-Bel Initiative

Main goal: Institutional remodelling of the Belgic state and the promotion of transparency in public administration. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Re-Bel Initiative

Transparency International in Belgium

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Belgium. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Belgium

The International Republican Institute in Bulgaria is a sort of civil society advocacy with the main purpose of preventing and fighting against corruption as other initiatives in the European Union, but it has the characteristic of putting emphasis on the reduction of opacity in public administration at a local level. On the other hand, Transparency International in Bulgaria gives support to civic platforms working to strengthen the notion of a national integrity system, and to reduce corruption at municipal administration. In Bulgaria, Transparency International is well-known for its work

"Local Integrity System Index" fortifying moral and ethical values towards integrity (Transparency International in Bulgaria, 2022). This is an indispensable effort to be made in the country and, certainly, if combined with the full employment of the functions and features for public procurement and government open data webpages can make the availability of data on emergency contracts in Bulgaria stronger. The possibility of increasing the interoperability of the data on public contracting in Bulgaria may also contribute to an easier re-use of information changing also the perception of citizenship on transparency. It is important to understand that seems to be a correlation between data access and social general understanding about corruption.

Civil Society Initiatives

Bulgaria

International Republican Institute

Main goal: Prevent and fight corruption with an emphasis on local opacity in public. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: International Republican Institute

Transparency International in Bulgaria

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Bulgaria. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Bulgaria

Croatian civil society initiative Gong is dedicated to the effectiveness of fundamental rights and, therefore, engaged in values like equality and safety especially for activists pro freedom of expression. Gong's objective comes across the notion that civil society should be more proactive in public affairs in order leverage the awareness on how corruption generally assumes invisible forms in social relations. Focus on public procurement has been taken as an effective instrument at a local level connecting citizenship to pub-

lic administration. The appropriate delivery of services and goods is a keyword that triggers the idea of equality and safety when individuals understand how non-transparent, secret or even void contracts may put their rights at risk. Transparency International in Croatia is another initiative with important projects involving, for example, the legal protection of whistleblowers as well as the implementation of the national law which regulates conflicts of interest between private and public sector (Transparency International in Croatia, 2020).

Civil Society Initiatives

Croatia

Gong

Main goal: Equal and safe society in which citizens are actively and constantly fighting for their beliefs and values. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: Yes. Webpage: Gong

Transparency International in Croatia

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Croatia. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Croatia

Yet not specifically working on public procurement information, Cyprus Integrity Forum is a civil society initiative focused on the content of public and corporate governance involving mutual gains or losses that might affect the public interest. It also calls the attention to the relevance of information quality on public affairs to ensure transparency in governmental bodies. The innovative idea of the forum is the defence of integrity emphasizing behavioral changes to diminish opacity in public administration.

Civil Society Initiatives

Cyprus

Cyprus Integrity Forum

Main goal: Enhance the content and quality of public and corporate governance in all forms of business as well as the way the State and all governmental bodies should act or behave to promote transparency and ethics in all respects. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Cyprus Integrity Forum

MOKAS

Main goal: Receiving, requesting, analyzing and disseminating disclosures of suspicious transactions reports and other relevant information concerning suspected money laundering and terrorist financing. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: MOKAS

Cyprus Forum

Main goal: An independent discussion forum that allows people to freely and anonymously express their opinion and debate issues on a wide variety of subjects. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Cyprus Forum

A similar initiative in the country is called MOKAS and its main goal is to persuade civil society to fight against corruption through mechanisms of disclosure. Another Cypriot non-governmental organization is the Cyprus Forum and is particularly devoted to make citizens use the right of expression to debate a wide rage of topics including transparency, corruption and integrity. According to the data collected for the SCO.R.E., the Cypriot case is an example of how the principles guiding these civil society initiatives make evident the way the functions and features found on the

Cypriot public procurement and government open data webpages should improve. If they become fully employed, the country may have the possibility of reducing the level of opaqueness in public contracts.

Civil Society Initiatives

Czech Republic

Digiwhist

Main goal: Data on public procurement. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: Yes. Webpage: Digiwhist

Zindex

Main goal: Public procurement benchmarking tool for authorities using real data to measure each authority's rate of transparency, efficiency and corruption potential in public procurement. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Zindex

Transparency International in Czech Republic

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Croatia. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Czech Republic

Czech Republic had under scrutiny its public procurement data between 2009 and 2012. The initiative Digiwhist was a project financed by the EU's research and innovation funding programme from 2014-2020, Horizon 2020. The main goals of Digiwhist were fiscal transparency, risk assessment and impact of good governance for those policies assessed. Another initiative which is still active is Zindex purporting to be a public procurement benchmark tool for authorities. The most updated data has been used to gauge the rate of transparency in the Czech public administration. An-

other purpose of the Zindex is the promotion of an efficient and transparent public administration through the analysis of public procurement. We also mention that Transparency International in Czech Republic has worked on different projects being one of them about public procurement information (Transparency International in Czech Republic, 2021).

Civil Society Initiatives

Denmark

Transparency International in Denmark

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Denmark. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Denmark

Although the Nordic countries usually have high scores in perception indicators, we lay stress on the fact that it has been difficult to find fully independent civil society initiatives against corruption. The actions of Transparency International in Denmark, Finland, and Sweden share common backgrounds with societies historically oriented by the publicity of public administration acts as a principle and the presence of local governments (Transparency International in Denmark, 2022; Transparency International in Finland, 2022; Transparency International in Sweden, 2022).

Civil Society Initiatives

Finland

Transparency International in Finland

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Finland. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Finland

Civil Society Initiatives

Sweden

The Swedish Anti-Corruption Institute

Main goal: Promote ethical decision processes among economic operators involving the rest of the Swedish society in order to prevent the use of bribes or other types of corruption as a means to influence any decision-making process. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: The Swedish Anti-Corruption Institute

Transparency International in Sweden

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Sweden. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Sweden

The Swedish Anti-Corruption Institute is a non-profit organization founded in 1923 and financed by "the Stockholm Chamber of Commerce (Sw: Stockholms Handelskammare), the Swedish Association of Local Authorities and

Regions (Sw: Sveriges Kommuner & Regioner) and the Confederation of Swedish Enterprise (Sw: Svenskt Näringsliv). Partner organizations are the Swedish Bankers' Association, the Swedish Construction Federation, the research related to pharmaceutical companies (LIF) and the Swedish Trade Federation". An interesting element of the institute's rationality is the prevention and fight against corruption based on the concept of "unauthorized influence" as follows: "A new government inquiry has been appointed to investigate measures to counter corruption and unauthorized influence. The investigation aims at ensuring that sufficient measures are taken so that society can prevent and counteract the problem in both the long and short term" (Swedish Anti-Corruption Institute, 1923). The Swedish Anti-Corruption Institute is devoted to the promotion of ethical decision processes within business as well as in the rest of the society. The idea is to prevent the use of bribes and other types of corruption that eventually affect the decision-making process of public administration.

Civil Society Initiatives

France

Mouvement des Entreprises de France

Main goal: Promote entrepreneurship, defend free enterprise and fair competition. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Mouvement des Entreprises de France

Transparency International in France

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in France. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in France

Similar to the Nordic principle for more competition in the European economy, the Mouvement des Entreprises de France has focused on the promotion of free access to information in France, avoidance of market distortions, anti-favoritism and other unfair preferential treatment between the public and private sector: "To achieve this, it takes initiatives that enable businesses to benefit from a favourable legislative and regulatory environment in the economic, fiscal, labour, environmental, and societal fields and to deploy their activities both in France and abroad. The MEDEF has launched many international initiatives: MEDEF International + Stratexio + Agyp." (Mouvement des Entreprises de France, 2022).

Civil Society Initiatives

Estonia

Rahvaalgatus

Main goal: Public and open society initiatives which are drafted then submitted to local governments or national parliament. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Rahvaalgatus

Transparency International in Estonia

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Estonia. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Estonia

Rahvaalgatus is a civil society initiative in Estonia oriented by the principle of open government motivating the Estonian citizenship to be more participative in the legislative process through the right to free speech. Although it is not a non-governmental organization working specifically on anti-corruption measures in public administration, the platform also promotes ini-

tiatives against corruption interacting with the Estonian Parliament with proposals like *We demand the government to repeal Act 165 SE*. This initiative, for instance, was a response to a proposed amendment to the Estonian constitutional system during pandemic caused by the COVID-19 that would permit the government to "limit citizens' right to freedom of assembly and speech, privacy and inviolability of private life", therefore, concentrating "more power in the hands of the central government, which allows the government to easily abuse its power" (Rahvaalgatus, 2020).

Civil Society Initiatives

Germany

Abgeordnetenwatch

Main goal: Report on topics such as lobbying, party donations and transparency in politics. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Abgeordnetenwatch

Offener Haushalt

Main goal: Data on government budget. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Offener Haushalt

Transparency International in Germany

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Germany. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Germany

In Germany, Abgeordnetenwatch is a non-government organization dedicated to report on issues like lobbying and party donations. Influence and negotiations using back-door deals in public affairs are targeted by Abgeord-

netenwatch. Transparency in politics is understood as a shield against negligence and irresponsible speech: "'Citizens ask - politicians answer' is the core of the portal. With our question portal we create public dialogue and transparency. In doing so, we ensure that the statements of the politicians are binding, as their positions can still be read years later [...] all questions and answers are checked by our moderators and compared with our moderation codex. In addition, the voting behavior and the committee memberships of the MPs as well as their secondary public activities" (Abgeordnetenwatch, 2022). Offener Haushalt is another initiative with the objective of producing data on government budget: "Our goal is to make households accessible and visualized for as many communities as possible. This allows citizens to view and more easily understand the finances of their municipality. We are also trying to improve the understanding and comparability of the data through ratios, e.g. per inhabitant or employed person. We hope that this will lead to more political participation, a better understanding of politics and an improved political dialogue. In addition, everyone, whether citizens, journalists, civil society or science, can analyze the data and use it for public accountability" (Offener Haushalt, 2022). The relevance of this action is the fact that all information at a municipal level matters to enhance transparency and accountability in public administration. In addition, "OffenerHaushalt.de is a voluntary project of the Open Knowledge Foundation Germany, which encourages participation. For example, citizens can request missing household data from their municipality via our freedom of information portal FragDenstaat uploading, visualizing and embedding it on Offener budget.de" (FragDenStaat, 2022). Another initiative is Transparency International with its presence in Germany since 1993. The organization has a myriad of projects and most of them engaged in a transparent dialogue between civil society and authorities with the purpose of more anti-corrupt actions based on the responsibility public managers should have in public administration.

Civil Society Initiatives

Greece

Vouliwatch

Main goal: Strengthen transparency and accountability promoting democratic participation with the help of digital technology. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Vouliwatch

Transparency International in Greece

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Greece. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Greece

With the support of digital technologies, Vouliwatch proposes to work shoulder to shoulder with citizenship to strengthen transparency in the Greek society. Opacity and economic corruption are understood by the initiative as the main causes of a long-term crisis in the country "The political system of entanglement, opacity and economic corruption has led us to a long-term crisis" (Vouliwatch, 2010). In order to stand against financial scandals and waste of public money, the strategy for a broader accountability used the right to access public information to mine the indifference of authorities towards people. The initiative maps the seats of parliament to give more visibility on how the parliamentary representatives vote and whether bills which eventually pass might affect citizens life. In this sense, the projects led by Transparency International in Greece are an asset to increase the level of engagement of public opinion and civil society to prevent and fight corruption. More transparency in the way the public debt has been negotiated with the EU is one of the hottest topics that called the attention of the public opinion.

Civil Society Initiatives

Hungary

Digiwhist

Main goal: Data on public procurement. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: Yes. Webpage: Digiwhist

Red Flags

Main goal: The Red Flags project aims to enhance the transparency of public procurements in Hungary and support the fight against corrupt procurements. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: Yes. Webpage: The Red Flags

Tenders Guru

Main goal: Reduce corruption risk by analysing local level public procurement processes and tackling inefficient spending of public funds. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: Yes. Webpage: Tenders Guru

Transparency International in Hungary

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Hungary. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Hungary

As the case of Czech Repbulic, Digiwhist had Hungary and Slovakia as objects of investigation. The collection of data on public procurement covered the period 2009-2012 financed by the European Union, Horizon 2020. It has been an important initiative specifically on public contracting, although no new

version of the project is under the radar.

Civil Society Initiatives

Slovakia

Digiwhist

Main goal: Data on public procurement. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: Yes. Webpage: Digiwhist

Transparency International in Slovakia

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Slovenia. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Slovakia

In Hungary, Red Flags collects data on public procurement, but focuses on the information available on the platform Tenders Electronic Daily which is the online version of the Supplement to the Official Journal of the EU dedicated to European public procurement. Red Flags aims at intensifying the transparency of public procurements diminishing opaqueness in public administration. It provides an interactive tool that allows the monitoring of procurement processes and its implementation by citizens, journalists or even public officials catching fraud risks at different stages of the procurement process. Red Flags aims at intensifying the transparency of public procurements and opposing corrupt procurements: "Although risky does not mean corrupt, flagged procurement documents are worth checking. Users can subscribe to receive alerts if risky procurements are published (generally or in their special field of interest)" (Flags, 2022). Tenders Guru is another initiative present in Hungary and specifically working on public procurement data. In Slovakia, Transparency International has identified that "Every year, about 5,000 tenders for 5 billion euros are held in Slovakia. However, accord-

ing to entrepreneurs, the competition is not fair - on average, a 13% bribe is said to be required to win a contract. Every third entrepreneur claims that he lost a win in a tender due to corruption (Eurobarometer 2019). For one fifth of the contracts, there is no competition at all - only one bidder gets it. The average in the EU is 20%. In addition, almost no one in our country goes to jail for machinations, despite hundreds of scandals - in the last ten years, not even 20 people have been convicted, moreover, all 'small fish"' (Transparency International in Slovakia, 2022).

Civil Society Initiatives

Ireland

Transparency International in Ireland

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Ireland. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Ireland

Although Transparency International has put forward different projects and initiatives to diminish opacity in public administration in Ireland, Latvia, Malta and Slovenia, no civil society initiative focusing primarily on public procurement and data related to public contracts was found. In these countries, the fight against corruption is intimately linked to freedom of expression or how public money is spent as the case of Malta. In 2017, the Maltese journalist Daphne Caruana Galizia was a victim of a terrorist attack. She was one of the public figures that fought against opacity in public administration through investigative journalism. In memoriam, Transparency International in Malta has supported the Daphne Caruana Galizia Foundation as a message of resistance and courage to support anti-corruption activism reporting dubious political events in Malta as well as investigating government corruption, forms of nepotism, patronage, and suspicious financial operations linked to money laundering.

Civil Society Initiatives

Latvia

Delna/Transparency International in Latvia

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Latvia. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Delna/Transparency International in Latvia

Civil Society Initiatives

Malta

Daphne/Transparency International in Malta

Main goal: Fight for press freedom, liberal democracy and against populism, corruption and impunity in Malta and internationally. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Daphne/Transparency International in Malta

Civil Society Initiatives

Slovenia

Transparency International in Slovenia

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Slovenia. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Slovenia

Civil Society Initiatives

Lithuania

Manovalstybe

Main goal: Transparent use of taxpayer money spent by municipalities on advertising and media. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Manovalstybe

Transparency International in Lithuania

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Lithuania. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Lithuania

Lithuania has a civil society initiative interested in pinpointing "how much money municipalities allocate to media through publicity contests and how much the media is connected to politicians" (ManoValstybe, 2022). This is the way that part of the Lithuanian society found to follow the connections between politicians and political parties, state and companies owned by the municipalities. Transparency International is also working with civil society to increase accountability in Lithuania. By far, Luxembourg has the worst scenario depicted by the international community concerning civil society initiatives fighting against corruption. Not even Transparency International has a mission in the country and the high level of opacity in public registers is another challenging issue. Foreign investments particularly managed by the Luxembourgian banks, which are obliged by the national law to keep their records updated, are still a matter under the public attention: "Interestingly, in the latest *Financial Secrecy Index*, Luxembourg was described as one of the 'most-improved jurisdictions', although it still ranks as the sixth most secretive country in the world (Kowalczyk-Hoyer & Heywood, 2017, p. 25).

Civil Society Initiatives

Luxembourg

Luxembourg is a special case study. According to Transparency International, the country has to assume certain commitments to provide more information on foreign investments. Data on public procurement is another challenging issue. No civil society initiative located in the country was found. No initiative led by Transparency International in Luxembourg.

Civil Society Initiatives

Netherlands

Integrity Watch/Transparency International in Netherlands

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Netherlands. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Integrity Watch/Transparency International in Netherlands

The scrutiny on how public money is spent in the Netherlands has necessarily a connection with the activity of the politicians. Relying on the support of Transparency International, Integrity Watch tracks and crosses the data on the income of politicians, how many trips they had and if they have received any form of gift during their mandates. The project includes a dashboard with interactive data scanning every member of the parliament and political parties: "By clicking on the list or graphs below, the 150 MPs and their parties are sorted according to their ancillary income, gifts received and the number of trips they have made. Integrity Watch NL makes it easier for citizens and journalists to monitor potential conflicts of interest in Dutch politics" (Integrity Watch/Transparency International in Netherlands, 2022).

Civil Society Initiatives

Poland

Tenders Guru

Main goal: Reduce corruption risk by analysing local level public procurement processes and tackling inefficient spending of public funds. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: Yes. Webpage: Tenders Guru

Zamówienia 20

Main goal: The Order Platform 2.0 is a tool that aggregates data on public tenders as well as private contracts and orders. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Zamówienia 20

Tenders Guru has also collected data specifically on public procurement in Poland. The information about the tenders focuses on contracts celebrated by local authorities. The digital platform registers figures on the types of procedure, number of bidders for competitive procedures, biggest purchasers and suppliers among other kinds of information. The data set is classified by areas such as construction, travels, services, and health. The other initiative is known as Zamówienia 20 and it aggregates data on public tenders, but also with information on companies eligible to disclose their information about their contracts with the public administration. In Portugal, Transparency International has a mission advocating more openness in the Portuguese political system, since the experts of the organization has found difficult the access to information or identified higher levels of corruption perception among citizens. The Observatório de Economia e Gestão de Fraude is a well-articulated civil society initiative for the prevention and the detection of fraud in public contracts. Money laundering activities and unregistered economies as a form of evading taxes are also in the observatory's radar.

Civil Society Initiatives

Portugal

Observatório de Economia e Gestão de Fraude

Main goal: Prevention and detection of fraud, corruption, unregistered economy as well as money laundering. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Observatório de Economia e Gestão de Fraude

Transparency International in Portugal

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Portugal. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Portugal

The last three countries with representative civil society initiatives in public procurement are Italy, Romania and Spain. Tenders Guru, for example, has projects to unveil public procurement information in Romania and Spain. In Italy, AppaltiPOP is proactively investigating and communicating the National Anti-Corruption Authority on irregularities, fraud and unfair competition involving public contracts. The non-governmental Italian organization idatichevorrei, working particularly with data on emergency contracts, diversifies the fight against corruption lobbying authorities or public administration for more data accessibility. In Italy, The Good Lobby is a third initiative with the same sense of duty towards democracy and citizenship including environmental justice and inequality. Libellula is similar to other initiatives insisting on the transparency of how the public money is spent in Italy. In Romania, Anticorrp supports anti-corruption policies linking democratic values to transparency in public administration, but it also fights for law enforcement measures preventing corruption.

Civil Society Initiatives

Italy

AppaltiPOP

Main goal: Collect and report on data involving the public contracts as well as communicating with the National Anti-Corruption Authority. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: Yes. Webpage: AppaltiPop

idatichevorrei

Main goal: Open data and accessible information on public contracts during the COVID-19 emergency. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: idatichevorrei

The Good Lobby

Main goal: Enhancing social and environmental justice, counter corruption and inequality, and amplify citizen voices. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: The Good Lobby

Libellula

Main goal: Availability of data and information from public administration to check how public money is spent. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: Yes. Webpage: Libellula

Transparency International in Italy

Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Italy. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Transparency International in Italy

Civil Society Initiatives

Romania

Anticorrp

Main goal: Promote the development of effective anti-corruption policies. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: Yes. Webpage: Anticorrp

Funky Citizens

Main goal: Funky Citizens wants to build online advocacy instruments based on research and carefully chosen data. Specifically on public procurement: No. Funds provided by the EU/European Commission or European Parliament: No information found. Webpage: Funky Citizens

Expert Forum

Main goal: Collect and publish information on public procurement to prevent and fight corruption. Specifically on public procurement: Yes. Funds provided by the EU/European Commission or European Parliament: Yes. Webpage: Expert Forum

Tenders Guru

Main goal: Reduce corruption risk by analysing local level public procurement processes and tackling inefficient spending of public funds. Specifically on public procurement: Yes. Funds provided by the

EU/European Commission or European Parliament: Yes. ■ Webpage: Tenders Guru

Transparency International in Romania

■ Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Italy. ■ Specifically on public procurement: No. ■ Funds provided by the EU/European Commission or European Parliament: No information found. ■ Webpage: Transparency International in Romania

Civil Society Initiatives

Spain

Access Info

■ Main goal: Promoting and protecting the right to information access. ■ Specifically on public procurement: No. ■ Funds provided by the EU/European Commission or European Parliament: Yes. ■ Webpage: Access Info

Fundación Civio

■ Main goal: Transparent governments and institutions as well as informed people. Use of journalism, advocacy and technology to achieve its objective. ■ Specifically on public procurement: Yes. ■ Funds provided by the EU/European Commission or European Parliament: No information found. ■ Webpage: Fundación Civio

Tenders Guru

■ Main goal: Reduce corruption risk by analysing local level public procurement processes and tackling inefficient spending of public funds. ■ Specifically on public procurement: Yes. ■ Funds provided by the EU/European Commission or European Parliament: Yes. ■ Webpage:

Tenders Guru

Transparency International in Spain

■ Main goal: Promote accountability in public administration, freedom of expression and anti-corruption initiatives in Italy. ■ Specifically on public procurement: No. ■ Funds provided by the EU/European Commission or European Parliament: No information found. ■ Webpage: Transparency International in Spain

Expert Forum and Tenders Guru have a similar objective in the sense they follow the inefficient spending of public money, but the former usually publishes reports to give a follow-up on what and how the taxpayer money is spent. Expert Forum also informs society on the products and goods bought by public administrations as a result of adjudicated contracts. On the other hand, Funky Citizens is a digital platform in which we can find research, data and study references on public procurement available. Apart from these initiatives, it is important to mention that Transparency International is present in Italy, Romania and Spain. In Spain, Civio Foundation has a broad spectrum on the functioning of public administration scrutinizing a plenty of topics such as power, justice, health, public procurement, environment among others. The studies on public procurement usually call the attention to numbers and facts, for instance, on how it was the concentration of contractual adjudication in Spain for every ten euros spent on emergency contracts (Fundación Civio, 2021). Quite similar to the work of Civio Foundation, Tenders Guru also collects and examines data on public procurement. A more general purpose against corruption is found within the work of Access Info. This initiative is dedicated to the promotion as well as the protection of the right to information access.

Perception versus Evidence

All sorts of documentation on those best practices against corruption have the potential to improve transparency and integrity in public sector. Nonetheless, a great deal of such effort usually depends on the production of evidence and less interference as possible of biased perception. Finding information about a contract object alongside other details such as the type of contract negotiation, or the amounts involving public tenders, for instance, may end up an obstacle for the identification of good practices in public procurement for many reasons. One of them is that data collection on public procurement is a time-consuming process. A second one is based on the fact that public procurement and government open data web portals have different functions and features. A third element of investigation is why the information on public contracting is not always available at different levels of the public administration, although it is well-known the European Union countries have complied with a legal framework to achieve the minimum standards of availability, interoperability and re-usability of data on public procurement.

Low level of competition in the public sector is another topic related to corruption (Abdou et al., 2022). The lower the number of companies and individuals offering goods or services, the higher the probability of opacity in public contracting affecting naturally the quantity of bidders. The point is that any kind of distortion in economy may affect the perception of those potential sellers not participating in the process. Economic operators are likely influenced by what they understand as fair in public procurement. An OECD report on public procurement states that: "Transparency in public procurement not only promotes accountability

and ensures access to information, it also serves an important role in levelling the playing field for businesses and allowing small and medium enterprises to participate on a more equal footing'' (OECD, 2016, p. 15). Specifically on the perception of corruption, there seems to be common the fact that the more the companies have the opportunity to attend events like training desks offered by public administrations, the more they gain confidence in the process envisaging the real possibilities of winning a bid (OECD, 2016, p. 21). We also point out how it is noteworthy when citizens and press can find, understand, and re-use objectively data on public contracts with a significant degree of confidence. If the information is complete and updated with data series specially on public procurement under emergency times, the perception of transparency may change rapidly among experts and business people. According to research evidence, the corruption perception has been proved to be correlated to what individuals see as moral or ethical deviation from those societal rules closer to integrity, fairness, and justice. Furthermore, perception is usually guided by what may be considered transparent, appropriate, acceptable, and adequate in the public eye, although it tends to change in essence from place to place (Melgar, Rossi, & Smith, 2010). More than a decade ago, a debate on corruption perception introduced by Transparency International showed that anti-corruption legislation is certainly indispensable for the control of public administration acts when adjudicating contracts, nonetheless, the third sector engagement in open data initiatives, for instance, combined with freedom of expression may strengthen the individual awareness of the fact that the debate goes beyond law enforcement (Kocaoglu & Figari, 2006).

4.1 Indexes on perception and evidence

The methodology created for the SCO.R.E. is based on the data collected from webpages for public procurement and government open data. This is what we refer as evidence in the compendium in contrast to the levels of perception captured by other indexes. After analyzing all the 27 EU public procurement webpages and government open data portals, we defined the constructs and the variables that could result in a quantifiable scale of

measurement for public procurement and government open data portals. We mention as an example the Guidance from the European Commission on using the public procurement framework in the emergency situation related to the COVID-19 crisis (2020/C 108 I/01). During the pandemic, a series of actions had to be improvised while the risk of producing less transparency elevated in public administration. The document calls the attention to the fact that deadlines had to be reduced, negotiated procedures or direct awards more common since the urgency for delivery meant also lives to be saved: "[...] possibilities to substantially reduce the deadlines to accelerate open or restricted procedures [...] a negotiated procedure without publication can be envisaged.

Eventually, even a direct award to a preselected economic operator could be allowed, provided the latter is the only one able to deliver the required supplies within the technical and time constraints imposed by the extreme urgency" (European Commission, 2020). The following subsections help us understand more precisely why the SCO.R.E. are strictly attached to quantifiable evidence. Moreover, why our metrics does not include other indicators with one or more components relying on different degrees of the corruption awareness. We argue on the fact that the cognizance of what is seen as a less or more opaque in public administration may be much more difficult to define and gauge. In many indexes, the manner of how corruption is perceived by experts and business people perhaps signalizes as well the difficulty of "standardizing" from country to country whether a public administrative act is tagged as corrupt or not. Based on certain moral standards shielded by integrity, the adjudication of a contract can be considered opaque and partially oriented, but the perception of the same event does not necessarily happen to be understood as dishonest in another society. In this sense, the parameters used by the SCO.R.E. have been thought to capture, for instance, if the information about an authority in preliminary consultation with a private economic operator is findable or if it is possible to check prior involvement of economic operators or tenderers before a contract adjudication (European Parliament and European Council, 2014).[1] Except World Bank indexes selected for

[1] See the articles 40 and 41 of Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC Text with EEA relevance.

this chapter, all other indicators such as the ones from Transparency International and Open Data Maturity have a degree of perception being measured and, therefore, incorporated in their methodologies. Since Part II, **Constructs and Variables**, introduces a deeper examination of the functions and features on public procurement and government open data webpages naming them as evidence, it is important to clarify what we point out as perception using examples beforehand.

4.1.1 Transparency International

The Corruption Perceptions Index calculated by Transparency International is mostly renowned for the aggregation of "data from a number of different sources that provide perceptions among business people and country experts of the level of corruption in the public sector" (Kocaoglu & Figari, 2006, p. 15). Although the questionnaires are not are filled in by every citizen, this sort of methodology puts emphasis on what even knowledgeable people may judge as inadequate or adequate in public administration relations. Moreover, the risk of corruption is not always based on data produced by Transparency International which may result in margin for error since its informants are not asked, for instance, to report whether the evidence used measures public procurement data. A recent study entitled *In the dark: who is behind Luxembourg's 4.5 trillion-euro investment fund industry?* revealed that "investment funds in Luxembourg largely operate in an opaque manner. With more than 4.5 trillion euros in assets under management, Luxembourg is home to the largest number of investment funds in Europe and the second largest in the world after the United States (US). Yet, despite recent anti-money laundering reforms, we know very little about who the real end-investors are and whether the funds they invest are of legitimate sources" (Szakonyi & Martini, 2021, p. 2). This investigation is a team effort between Transparency International and Anti-Corruption Data Collective that used Open Lux which is a database created by Le Monde and the data had been scraped from the Luxembourg Register of Beneficial Owner covering the period of November 2019 and December 2020. Nonetheless, Luxembourg has a high score in the Perception Corruption Index published by Transparency International. The country ranks 81 over 100 points be-

hind the highest score of 88 points for Denmark, Finland and New Zealand; 85 Norway, Singapore and Sweden; and 84 Switzerland; 82 Netherlands (Corruption Perceptions Index, 2021)

If we consider only European countries, Luxembourg occupies the seventh position in the Corruption Perceptions Index. Szakonyi and Martini (2021) show in their study the opacity in terms of data can be measured by objective standards. In that case, their analysis concludes Luxembourg's database regarding its public registers system on foreign funds are imprecise, unverified and most of them untraceable. This is one of the reasons that justifies the SCO.R.E. outputs. The data we collected from the public procurement and government open data webpages points to the necessity of a more structured and objective way to estimate the risk of corruption or wrongdoings in public-private relations in Luxembourg. A previous report published in 2017 sets a precedent for poor databases regarding foreign investments in Luxembourg and other European countries: "Public scrutiny is essential for the accountability of these mechanisms, but this report shows that in countries hosting major financial centres, data on anti-money laundering prevention and enforcement is treated as if it were Top Secret. Just one in three basic anti-money laundering indicators drawn from internationally accepted guidelines is available to the public and up to date across 12 countries hosting major financial centres, including the U.S., the U.K., Germany, Switzerland and Luxembourg" (Kowalczyk-Hoyer & Heywood, 2017, p. 3). Kowalczyk-Hoyer and Heywood (2017) suggest the need for updated public beneficial ownership registers meaning Luxembourg should verify why the data collected varies significantly. Moreover, another study identifies a high level of data inaccuracy for foreign capital registers and the fact that the country has put little emphasis on the urgency of following the origin of international investments to ameliorate the quality of the public databases to fight against corruption (Szakonyi & Martini, 2021, p. 8). These issues have at least three front lines. Firstly, a legal framework without the tools to enforce the law on foreign funds prioritizing more transparent public registers. Secondly, the use of a transnational governance arrangement to elevate integrity in public-private relations regarding foreign funds. Thirdly, the absence of public procurement and government open data webpages with functions as well as features designed to make data on public contracting more available, interoperable and re-usable.

4.1.2 Open Data Maturity

The Open Data Maturity Index uses a metrics to assess government open data webpages divided in four dimensions: open data policy, open data impact, open data portal, and open data quality (Data.europa.eu, 2021, p. 9-10). Open data policy gauges those specific policies and strategies for open data portals at a national level. Governance structures are also analyzed meaning that the participation of private and third sector actors is taken into consideration. Open data initiatives from civil society and training schemes strengthening data literacy skills among civil servants as well as any mechanism fostering the awareness of available open data in the country are also measured. It is clearly a dimension in which the perception of respondents is partially vital for the construction of the indicator. Regarding open data impact, the re-use of data plays an important role to measure the maturity of open data practices: "Beyond this first layer of 'strategic awareness', the impact dimension focusses on four areas of sectoral impact: political, social, environmental, and economic" (Data.europa.eu, 2021, p. 9). Another relevant aspect that should also be mentioned is about the participants' perception on data re-use. The second dimension named open data impact calculates part of the index through the application of questionnaires leaving the answers to be formulated by the participants relying on their own cognizance of the re-use of open data published so far: "Within these areas, the questionnaire examines the extent to which monitoring is in place to document the re-use of open data published in these fields, the extent to which applications, products, and services have been developed to address challenges in these fields, as well as the extent to which civil society initiatives exist that are based on such open data and supported by government institutions. In addition, the dimension includes the efforts taken to commission and conduct studies that measure the impact created through open data re-use in each of the impact areas" (Data.europa.eu, 2021, p. 9). The third dimension identified as open data portal refers to those advanced portal functions that allow both skilled and less skilled users to access open data though the national webpages. It also examines whether the web features have the capacity to increase the interaction between publishers and re-users. This dimension basically assesses the extent to which the manage-

ment of portals employs web analytics tools to understand appropriately their users' demands and behaviour to systematically update: "the portals' features in line with the insights gained from these analyses. The dimension examines the open data coverage across different domains, as well as the approach and measures in place to ensure the portal's sustainability" (Data.europa.eu, 2021, p. 9). That sort of mechanism is more detached from the notion of perception we are trying to avoid and, consequently, closer to a more objective measurement of open data as seen in the SCO.R.E. outputs. In regard to open data quality, this fourth dimension of the Open Data Maturity indicator relies on the mechanisms adopted by webpage managers to gather systematically metadata from different "sources across the country, as well as the currency of the available metadata and where possible the actual data, the monitoring of the compliance with the DCAT-AP metadata standard as well as the quality of deployment of the published data. The fourth dimension provides impulses for portal managers and policymakers to enable open data publication that is good quality all round: using open data formats, machine-readable, high quality, and suitable to a linked data approach" (Data.europa.eu, 2021, p. 10). About the questionnaires applied by Open Data Maturity, the last report says: "Every year, the data is collected through a questionnaire sent to the national open data representatives working in collaboration with the European Commission and the Public Sector Information Expert Group. The questionnaire is structured along the four open data dimensions and includes detailed metrics for each dimension to assess the level of maturity" (Data.europa.eu, 2021, p. 9). However, along the questionnaire, it is possible to observe a certain level of perception since it includes less objective responses.

4.1.3 Open Budget Partnership

According to the last report published by Open Budget Survey in 2021, the methodology to assess the budget accountability is divided into three facets: "The Open Budget Survey assesses the three components of a budget accountability system: public availability of budget information; opportunities for the public to participate in the budget process; and the role and effectiveness of formal oversight institutions, including the legislature and the na-

tional audit office (referred to here as the 'supreme audit institution'). The majority of the survey questions assess what occurs in practice, rather than what is required by law" (Open Data Survey, 2021, p. 65). Although objective questions are posed to the participants of the survey, the fact of asking people for information triggers the human effect in the indicator. In this sense, Open Budget Survey differs radically from the methodology of the SCO.R.E., because in the latter the countries will score based on functions and features found on their public procurement and government open data webpages. The index puts emphasis on digital information published by the public administration of the countries to gauge transparency capacity, but the methodology conforms a considerable level of impressions on the idea of transparent and participatory governments. A questionnaire with 145 scored questions is filled by researchers from civil society organizations or academic institutions: "Of the 145 scored questions in the questionnaire, 109 questions assess the public availability of budget information, 18 questions assess opportunities for the public to participate in the budget process, and 18 questions assess the role and effectiveness of the legislature and the supreme audit institution. The questionnaire also includes an additional 83 questions that are not used to calculate individual scores but help to complete the [Open Budget Survey] OBS research by collecting background information on key budget documents and exploring different characteristics of a country's public finance management system" (Open Data Survey, 2021, p. 65). Once Open Budget Survey questionnaire is completed, the responses are quantified producing eventually the final score for each country. Yet on the contrasts of this index compared to the SCO.R.E. to outline more appropriately what we mean for human factor or interference closer to perception, the OBS survey classifies the information collected with the questionnaires in five levels, that is, "best", "good practice", "minimal efforts", "standards not met at all", and "standard not applied" (Open Data Survey, 2021, p. 66). Nevertheless, these categories are usually attached to the view of the participants either academics or third sector members collaborating with the construction of the indicator. With the exception of the last category, "standard not applied", which is basically referring to the fact of a country accepting or not a foreign aid, the other questions tend to lead the participants to respond based on discernment or awareness they have

about the digital documents published by governments: "The OBS 2021 assesses only documents published and events, activities, or developments that took place through 31 December 2020; any actions occurring after this date are not accounted for in the 2021 survey results. OBS researchers began collecting evidence in January 2021, including budget documents released prior to the research cut-off date, participation mechanisms conducted, and oversight practices followed". What is usually defined as collected evidence by the methodology of the OBS, we classify as evidence noticed since the answers of the questionnaire will reflect exactly the information that came to participants' knowledge and were duly noted. What is named evidence by Open Budget Survey, we understand as partial signs of facts since the content of many questions may vary from the human perspective specially the choices made while respondents are asked to explore the country's public finance management system.[2]

4.1.4 World Bank Indexes

World Bank indexes on fixed broadband subscribers and the statistics of individuals using internet measure how many people have been accessing online information every year. It shows in numbers what is very intuitive for many, that is, there are more and more people consuming information on webpages, socio media portals, message applications among other very popular channels of free content. However, the idea of bringing forward these two indicators helps us understand more appropriately that a simple or immediate correlation between more access to internet and more informed civil societies about corruption is not necessarily true. On the other hand, the way information available on internet and conveyed via applications may influence the citizens' views on governments, politics and democracy with distorted information, fake news, half-true stories and prejudice not corresponding necessarily to facts.[3]

4.1.5 European Research Centre for Anti-Corruption and State-Building (ERCAS)

[2] Open Budget Survey Index has been regularly published every two years covering the period 2006, 2008, 2010, 2012, 2015, 2017, and 2019, and 2021.

[3] We will run some tests between the SCO.R.E. and indicators on corruption in chapter 8.

European Research Centre for Anti-Corruption and State-Building (ERCAS) is an indicator which in part measures the time spent by private sector paying taxes. Five components are used derived from a single data source being budget transparency, administrative transparency, online services, judicial independence, and freedom of the press: "These components' scales are standardized by constructing the 'z-score' of the variable in order to equalize their mean values and standard deviations. For budget transparency, the mean score for the individual items considered was extracted and then standardized; administrative transparency in turn consists of the sum of four individual components from the Transparency Index, which was then similarly standardized into z-scores. The final component, e-citizenship, is the only one based on different data sources. Its individual sub-components were standardized separately and then averaged" (European Research Centre for Anti-Corruption and State-Building, 2022). As we will see in chapter 7, section 8.2, the reason we selected the aspect "time to pay taxes" of the index has to do with the commonplace of inefficient and expensive bureaucracy in the southern or the eastern European countries. As aforementioned, the digital level of public procurement and government open data webpages in Bulgaria, Italy, Poland, Portugal, and Spain, for instance, revealed much more preparedness for emergency times than the cases of Austria, Denmark, France, Sweden or other countries scoring more in Corruption Perceptions Index, Transparency International. In this sense, our argument is then posed under a general condition. If the use of the functions and features on public procurement and government open data webpages increments the score of the countries, when public servers or managers upload data on public contracts, civil society initiatives usually more qualified technically may have a more coherent perception on data transparency even having in mind different indicators.

4.1.6 European Quality of Government Index

European Quality of Government Index is a well-known indicator based on surveys focusing on sub-national level of governance within the European Union: "The European Quality of Government Index (EQI) is the result of novel survey data regional (e.g. sub-national) level governance within the EU. The

data was first gathered and published in 2010 and then repeated in 2013, 2017, and 2021. The index is based on a large citizen survey where respondents are asked about perceptions and experiences with public sector corruption, along with the extent to which citizens believe various public sector services are impartially allocated and of good quality" (European Quality of Government Index). According to the literature published by the Quality of Government Institute, University of Gothenburg, the index has three pillars, i.e., corruption, being built up from the ground by perceptions about corruption; then the pillars impartiality and quality: "the EQI is the largest survey ever undertaken to measure the perceptions of quality of government, and it collects the opinions of over 129,000 respondents in a total of 208 NUTS 1 and NUTS 2 regions in all EU 27 member state countries" (Charron, Lapuente, & Bauhr, 2021, p. 3). In chapter 8, section 8.2, tests are run and we see how our model fits more adequately some indicators closer to data based on evidence than others including the European Quality of Government Index.[4]

[4] "The data was first gathered and published in 2010 and then repeated in 2013, 2017, and 2021", see European Quality of Government Index, 2021

CONSTRUCTS AND VARIABLES

Towards data quality in public procurement

Availability is the first element that data on public procurement must meet and it refers to the fact that the data is ready to be accessed. In this regard, Soylu mentions that "transparency and accountability require giving citizens and companies much more data with the possibility of easily connecting relevant data sets (e.g., spending and company data), both within and beyond national borders and languages, allowing extended and deeper analyses" (Soylu et al., 2022). For this, the information must be complete referring to all the aspects related to the life cycle of the contracts as well as to all the people who participate in it excluding naturally personal data, confidentiality of information, intellectual property, and public safety protected by law. Another aspect that should be mentioned is how interoperability is gauged by the SCO.R.E. outputs. Data on public procurement is produced every minute in all countries of the European Union, but not necessarily all municipalities and regions, for instance, upload their databases on central public procurement and government open data webpages.

Secondly, the coordination of standards is essential to diminish opaqueness in public administration and public contracting (Prier, McCue, & Boykin, 2018). It usually needs webpages to have certain functions before announcing a public contract, so the availability of data tends to increase in quantity, quality and integration. For instance, a checkbox containing the options "publish at a local level" or "publish at a regional level" and "publish at all levels" may solve intuitively with clicks

the lack of information by putting to work a webpage function. This sort of tool makes the information on public procurement simultaneously appear on different portals increasing the degree of data availability, but, since it shares and integrates information, there is also a positive effect on data interoperability. In this sense, interoperable data has to do with technology, in our case functions and features of webpages, but it also requires taking into account other factors such as social, political and organizational deciding in how interoperability should be put in practice (Cerrillo i Martínez, 2010; Gottschalk & Solli-Sæther, 2009).

A third aspect is the level of re-usability observed on public procurement and government webpages. Based on evidence collected for the SCO.R.E., particularly on extraordinary procedures during the emergency times, the lack of data or low amount of information being re-used can be more explained by the fact that functions or features have been underused than the fact of inexistent tools. Figures 7.3, 7.4, 7.5, 7.6, 7.7, and 7.8 show that Estonia, Italy, Slovenia, Portugal, and Spain have the functions necessary to improve the availability and interoperability of data as Figure 1.1 indicates. In a nutshell, public procurement and government open data webpages of these countries are apt to offer more data on public contracting. As a consequence, civil society initiatives can start or expand the re-use of information to prevent and fight against corruption.

However, is it possible to check the quality of our information on public procurement and government open data webpages? And how can we measure the quality of our data having in mind the constructs availability, interoperability and re-usability for each country? In order to answer the first question, we compared the meanings attributed to each construct and variable in our data with the syntactic and semantic definitions defined by the SQuaRE Portal Model. In this second part of the compendium, our constructs and variables are set side by side as Table 8.4 shows. Regarding the second question, we have normalized the SCO.R.E. and the indicators on corruption as it is seen in Table 8.5 with the purpose of testing statistically our data as section 8.2 and subsections 8.2.1, 8.2.1.1, 8.2.1.2, 8.2.2, and 8.2.3 will introduce. Since the access of information on public procurement is indispensable for higher data quality, we included in the construct availability variables representing data accessibility such as contract authority, contract

object, contract amount among others as indicated in the literature on data quality (Fazekas, 2017; Villamil, Kertész, & Wachs, 2022). In that case, the functions and features of webpages are understood from the perspective of tools able to catch more objective definitions on data quality. Data on public procurement will be, therefore, more complete, accurate, consistent as well as accessible (Cichy & Rass, 2019) based on the webpages evidence and not on the perception of what public servers, managers and administrators see or think about integrity in public contracting.

Constructs and Variables

This chapter introduces the syntactic and semantic definitions used to classify the SCO.R.E. outputs. Since the constructs availability, interoperability and re-usability have very broad meanings, it is important to detail how each construct is subdivided and then conceptualize the variables inside each subdivision. The aforesaid constructs organize eighty variables being fifty variables applied to public procurement webpages and thirty to government open data portals. We remember that the variables are not used to analyze the quality of information in itself, i.e., they do not check every local, regional and national level of public procurement data set. That task would be inhuman without the use of programming languages and algorithms designed to mine an avalanche of documents regarding public procurement happening in all the 27 countries of the European Union. What we do is the identification, classification and assessment of each function as well as feature on the webpages. The more digital tools, buttons, structured information, hyperlinks, user guides, legislation etc, the higher the score. The second subsection draws up the weights applied to the two categories of variables differentiating therefore non-emergency or ordinary procedures from emergency or extraordinary procedures. In short, the general variables influence less the SCO.R.E. than the sensitive variables. Additionally, the sensitive factors were conceived to recognize the functions and the features on webpages for public procurement under emergency times, for instance, a button or a hyperlink directing the user to a specific place with all the information concerning extraordinary procedures.

6.1 Syntactic and semantic definitions

Tables 6.1, 6.2 and 6.3 show three columns, i.e., construct with their respective subconstructs, variables and the syntactic and semantic definitions used to categorize the SCO.R.E. outputs. As it is displayed in Tables 7.5 and 7.6, the acronyms AAC, AAEA and AAU stand for, respectively, Availability-Accessibility Completeness, Availability-Accessibility Easy Access and Availability-Accessibility Understandability. The constructs AQ and AO refer to Availability Quality and Availability Openness identifying the functions and features related to the quality of data on public procurement webpages as well as its level of openness. Inter is an abbreviation for the construct Interoperability regarding the capacity of the official webpages sharing and integrating data on public procurement; and Re-Use, the construct re-usability of the data on public contracting. The same acronyms are repeated after ODP which corresponds to open data Portals as Tables 6.4 and 6.5 present. The tables containing the syntactic and semantic definitions also indicate the variables concerning emergency times and they are indicated by gray color in their corresponding table lines. The rows in white represent those general variables linked to ordinary procedures, that is to say, applied by the contracting authorities.

6.2 Values and weights for the SCO.R.E.

There are two types of numerical values in the SCO.R.E. outputs. In case the webpage for public procurement of country x, for example, has the functions and features we are looking for, it will score 1. If not, it scores 0. We have created 52 non-emergency variables that compute good practices in public contracting for both types of webpages, i.e., public procurement and government open data portals. On the other hand, 28 emergency variables quantify specifically those good practices for public procurement and government open data webpages under emergency times. As we see in Tables 6.1, 6.2, 6.3, 6.4 and 6.5, the rows in white weigh 0,945 corresponding, therefore, to non-emergency variables while the ones in gray 1,815 referring to the emergency variables. For non-emergency variables, we define w_i

Table 6.1: SCO.R.E.: syntactic and semantic definitions (I)

Construct	Variable	Syntactic and Semantic Definitions
AAC-01:	Territorial Level (info)	If the contracts available on the e-public procurement platforms bring information about territorial level, the country scores 1. If not, 0.
AAC-02:	Authority ID	If the contracts available on the e-public procurement platforms identify the authorities, the country scores 1. If not, 0.
AAC-03:	Contract Object	If the contracts available on the e-public procurement platforms have information of what is being bought (goods or services), the country scores 1. If not, 0.
AAC-04:	Contract Amount	If the contracts available on the e-public procurement platforms have information related to prices, the country scores 1. If not, 0.
AAC-05:	Contract ID/CPV/Case File	If the contracts available on the e-public procurement platforms identifies the public authorities and/or the contracts by a code/case file, the country scores 1. If not, 0.
AAC-06:	Contract Duration	If the contracts available on the e-public procurement platforms have information of the contract duration, the country scores 1. If not, 0.
AAC-07:	Contract Type	If the contracts available on the e-public procurement platforms have information of the type of contract (fixed-priced contract, cost reimbursable contract or time and materials contract), the country scores 1. If not, 0.
AAC-08:	Contract Updates	If the contracts available on the e-public procurement platforms inform on updates (day, month and year), the country scores 1. If not, 0.
AAC-09:	How many tenders?	If the contracts available on the e-public procurement platforms have information related to the number of suppliers participating in the call, the country scores 1. If not, 0.
AAC-10:	Procedure	If the contracts available on the e-public procurement platforms have information of procedure (open, negotiated etc), the country scores 1. If not, 0.
AAC-11:	Emergency Justification	If the contracts available on the e-public procurement platforms have information concerning emergency (COVID-19, war etc), the country scores 1. If not, 0.
AAC-12:	Open Tender Notice	If the e-public procurement platform has a channel for suppliers to publish their offers, the country scores 1. If not, 0.
AAC-13:	Tender Name	If the e-public procurement platforms disclose tender's name, the country scores 1. If not, 0.
AAC-14:	Tender ID	If the e-public procurement platforms disclose the name of the tenders (suppliers), the country scores 1. If not, 0.
AAC-15:	Other Documents (Gov)	If the e-public procurement platforms make other documents available (legislation, instructions, FAQ etc), the country scores 1. If not, 0.
AAC-16:	Aggregated Info (Contract Copy)	If the e-public procurement platforms make a contract copy available, the country scores 1. If not, 0.

Table 6.2: SCO.R.E.: syntactic and semantic definitions (II)

Construct	Variable	Syntactic and Semantic Definitions
AAEA-01:	Public Web	If the e-public procurement platforms conduct through a web (electronically), the country scores 1. If not, 0.
AAEA-02:	Emergency Contract (Internal/External Web)	If the e-public procurement platforms give the option of using a specific webpage for emergency contracts (COVID-19, war etc) to suppliers, the country scores 1. If not, 0. The emergency portal be an internal link (inside the webpage) or external (another address indicated on the e-procurement portal).
AAEA-03:	Emergency Contracts (Info)	If the e-public procurement platforms have information on how a supplier can make an offer under emergency time, the country scores 1. If not, 0.
AAEA-04:	Info about Web/e-procurement	If the e-public procurement platforms have information related to e-procurement process (how to apply, which criteria are taken into consideration, legislation etc), the country scores 1. If not, 0.
AAEA-05:	Contact Channels	If the e-public procurement platforms have contact channels (e-mail, chat, traditional address etc) to solve general doubts, the country scores 1. If not, 0.
AAEA-06:	FOIA/Transparency Act	If the e-public procurement platforms have information about transparency (legislation, compliances etc), the country scores 1. If not, 0.
AAEA-07:	Hyperlinks/Icon Emergency	If the e-public procurement platforms have visible icons and hyperlinks for emergency, the country scores 1. If not, 0.
AAEA-08:	Search Engine for the Contracts	If the e-public procurement platforms have search engine bars to make easier for the user the access to information, the country scores 1. If not, 0.
AAEA-09:	Information Structure	If the e-public procurement platforms have a design about public procurement organized with a navigation bar on top of the webpage, graphic icons to facilitate the user finding the information etc (enhancing the user experience), the country scores 1. If not, 0.
AAEA-10:	Site Map	If the e-public procurement platforms show a link for a site map at the bottom of the page, the country scores 1. If not, 0.
AAEA-11:	Complaint Channel	If the e-public procurement platforms have a link for complaints, the country scores 1. If not, 0.
AAEA-12:	Anonymous Disclosure	If the e-public procurement platform gives the possibility to the user of communicating anonymously with the authorities responsible for public procurement, the country scores 1. If not, 0.
AAEA-13:	Whistleblowers Protection	If the e-public procurement platforms have a mechanism of protection (anonymity and person's data protection), the country scores 1. If not, 0.
AAEA-14:	Data Protection	If the e-public procurement platforms bring information (legislation, legal grounds, national law and European directives on data protection for suppliers), the country scores 1. If not, 0.
AAEA-15:	Intellectual Property	If the e-public procurement platforms have information about the use of information how to use it and if there is any intellectual property condition, the country scores 1. If not, 0.
AAEA-16:	Help	If the e-public procurement platforms have a help desk for users (different from contact channels), the country scores 1. If not, 0.

Table 6.3: SCO.R.E.: syntactic and semantic definitions (III)

Construct	Variable	Syntactic and Semantic Definitions
AAU-01:	Graphics	If the e-public procurement platforms present information about public procurement using graphics (charts, infographics, tables etc), the country scores 1. If not, 0.
AAU-02:	Info based on Directive (UE) 2016/2102	If the e-public procurement platforms have information about public procurement and accessibility, the country scores 1. If not, 0.
AAU-03:	Information Levels	If the e-public procurement platforms have legal information on different levels about public procurement (local, intermediate and state level especially on emergency times), the country scores 1. If not, 0.
AAU-04:	Information Complexity	If the e-public procurement platforms have information complexity on public procurement made accessible simplifying the language, explaining processes, diversifying tools such as video tutorials or apps (especially on emergency times), the country scores 1. If not, 0.
AAU-05:	FAQs	If the e-public procurement platforms have a section or at least a document with FAQs, the country scores 1. If not, 0.
AQ-01:	Precise/Certified Data	If the e-public procurement platforms have mechanisms to certify the information, the country scores 1. If not, 0.
AQ-02:	Last Updates	If the certified information can be traced according to the last updates (especially on emergency times), the country scores 1. If not, 0.
AQ-03:	Updates Frequency	If the certified information has a list of the last updates (especially on emergency times), the country scores 1. If not, 0.
AO-01:	Data Format	If the e-public procurement platforms bring information through different data format (reports, numbers, basic statistics, graphs etc), the country scores 1. If not, 0.
AO-02:	Standard	If the data is open and contributes to a higher quality of information (especially on emergency times), the country scores 1. If not, 0.
Inter-01:	Different Government Levels	If the e-public procurement platforms have information/data on contracts making references to different levels of the public administration/authorities, the country scores 1. If not, 0.
Inter-02:	Interoperability Standards	If the information is shared and integrated (different platforms related to e-procurement have the same information found on e-procurement platforms using the same format, especially on emergency times), the country scores 1. If not, 0.
Inter-03:	Hyperlinks to other Gov. Levels	If the e-public procurement platforms facilitate hyperlinks to different levels of the public administration/authorities (especially on emergency times), the country scores 1. If not, 0.
Re-Use-01:	API	If the e-public procurement platforms present information or conduct public through applications, the country scores 1. If not, 0.
Re-Use-02:	Metadata	If the e-public procurement platforms have clear documentation explaining technical information (E.g., CPV), the country scores 1. If not, 0.
Re-Use-03:	Information on Fees	If the e-public procurement platforms have information about fees (sometimes fees are charged based on specific demands from users, i.e., especially data on emergency), the country scores 1. If not, 0.

Table 6.4: SCO.R.E.: syntactic and semantic definitions (IV)

Construct	Variable	Syntactic and Semantic Definitions
Re-Use-04:	Free Re-Use/Data Re-Use Licence	If the e-public procurement platforms offer the possibility of using the data on contracts freely and stating clearly licences, the country scores 1. If not, 0.
Re-Use-05:	Machine-Readable Data	If the e-public procurement platforms have data easily readable by machines (operating systems from the most to the least common like Windows, Mac, Linux etc), the country scores 1. If not, 0.
ODP–01-AAEA:	Webpage	If the country has an webpage, it scores 1. If not, 0.
ODP-02-AAEA:	data.europa.eu	If the country has a section for on data.europa.eu, it scores 1. If not, 0.
ODP-03-AAEA:	Contact Channels	If the open data portals have contact channels (e-mail, chat, traditional address etc) to solve general doubts, the country scores 1. If not, 0.
ODP-04-AAEA:	FOIA/Transparency Act	If the open data portals have information about transparency (legislation, compliances etc), the country scores 1. If not, 0.
ODP-05-AAEA:	Search Engine for the Data	If the open data portals have search engine bars to make easier for the user the access to information, the country scores 1. If not, 0.
ODP-06-AAEA:	Information Structure	If the open data portals have a design about organized with a navigation bar on top of the webpage, graphic icons to facilitate the user finding the information etc (enhancing the user experience), the country scores 1. If not, 0.
ODP-07-AAEA:	Site Map	If the open data portals show a link for a site map at the bottom of the page, the country scores 1. If not, 0.
ODP-08-AAEA:	Data Protection	If the open data portals bring information (legislation, legal grounds, national law and European directives on data protection for suppliers), the country scores 1. If not, 0.
ODP-09-AAEA:	Intellectual Property	If the open data portals have information about the use of information how to use it and if there is any intellectual property condition, the country scores 1. If not, 0.
ODP-10-AAEA:	Help	If the open data portals have a help desk for users (different from contact channels), the country scores 1. If not, 0.
ODP-11-A-Q:	Last Updates	If the certified information can be traced according to the last updates (especially on emergency times), the country scores 1. If not, 0.
ODP-12-A-Q:	Updates Frequency	If the certified information has a list of the last updates (especially on emergency times), the country scores 1. If not, 0.
ODP-13-A-O:	Data Format	If the e-public procurement platforms bring information through different data format (reports, numbers, basic statistics, graphs etc), the country scores 1. If not, 0.
ODP-14-A-O:	Standard	If the data is open and contributes to a higher quality of information (especially on emergency times), the country scores 1. If not, 0.

Table 6.5: SCO.R.E.: syntactic and semantic definitions (V)

Construct	Variable	Syntactic and Semantic Definitions
ODP-15-A-O:	Data Efficiency	If the country publishes data on public procurement on its webpage in an efficient fashion, the country scores 1. If not, 0.
ODP-16-A-O:	Data on Emergency Contracts	If the country publishes data on public procurement (emergency contracts), it scores 1. If not, 0.
ODP-17-A-O:	Data at Different Administrative Levels (Regions/Municipalities)	If the country publishes data on public procurement identifying all administrative levels, it scores 1. If not, 0.
ODP-18-Inter:	Sharing	If the country shares the same information on public contracts using the same format on its webpage and data.europa.eu, it scores 1. If not, 0.
ODP-19-Inter:	Integrated	If the country integrates the same information on public contracts using the same format on its webpage and data.europa.eu, it scores 1. If not, 0.
ODP-20-Inter:	Different Government Levels	If the e-public procurement platforms have information/data on contracts making references to different levels of the public administration/authorities, the country scores 1. If not, 0.
ODP-21-Inter:	Interoperability Standards	If the information is shared and integrated (different platforms related to e-procurement have the same information found on e-procurement platforms using the same format, especially on emergency times), the country scores 1. If not, 0.
ODP-22-Inter:	Hyperlinks to other Gov. Levels	If the e-public procurement platforms facilitate hyperlinks to different levels of the public administration/authorities (especially on emergency times), the country scores 1. If not, 0.
ODP-23-Re-Use:	Downloadable and Easy to Mine	If the data and information can be easily downloaded, the country scores 1. If not, 0.
ODP-24-Re-Use:	eInvoicing Verified	If the country has contributed to the implementation of eInvoicing mechanisms (verifying the information about public procurements systematized by the European Commission), it scores 1. If not, 0.
ODP-25-Re-Use:	Administrative Capacity	If the country has contributed to the analysis of the administrative capacity conducted by the European Commission, the country scores 1. If not, 0.
ODP-26-Re-Use:	API	If the e-public procurement platforms present information or conduct public through applications, the country scores 1. If not, 0.
ODP-27-Re-Use:	Information on Fees	If the e-public procurement platforms have information about fees (sometimes fees are charged based on specific demands from users, i.e., especially data on emergency), the country scores 1. If not, 0.
ODP-28-Re-Use:	Free Re-Use/Data Re-Use Licence	If the e-public procurement platforms offer the possibility of using the data on contracts freely and stating clearly licences, the country scores 1. If not, 0.
ODP-29-Re-Use:	Re-use conditions	If the open data portals have information about the conditions to re-use information, the country scores 1. If not, 0.
ODP-30-Re-Use:	Machine-Readable Data	If the e-public procurement platforms have data easily readable by machines (operating systems from the most to the least common like Windows, Mac, Linux etc), the country scores 1. If not, 0.

being $_i$ the number of variables varying from 1 to 52, and for emergency variables v_i considering $_i$ the specific variables varying from 1 to 28. The formula used by the SCO.R.E. model to calculate the risk of corruption on webpages dedicated to public procurement and government open data portals is as follows:

Non-Emergency Variables= w_i and **Emergency Variables**= v_i

(i)

$$CO.R.E.\ Index = \left[\left(\sum_{i=1}^{52} f(w_i)\right) \times 0,945\right] + \left[\left(\sum_{i=1}^{28} f(v_i)\right) \times 1,815\right]$$

(ii)

$$[(w_1 + w_2 + ... + w_{52}) \times 0,945] + [(v_1 + v_2 + ... + v_{28}) \times 1,815]$$

The SCO.R.E. indicator collect the data based on what is found and can be accessed as well. The values in white lines are multiplied by 0,945 when the country scores; and the gray lines by 1,815 if the function or feature is found. Since we assume the proportion 50-50 representing approximately 50% of chance of finding or not finding the functions and features that may serve the best practices to prevent and fight corruption, having 52 general variables and 28 emergency variables for emergency contracts.[1]. The following **chapter 7** will bring forward some of the reasons explaining why some countries have better practices than others.

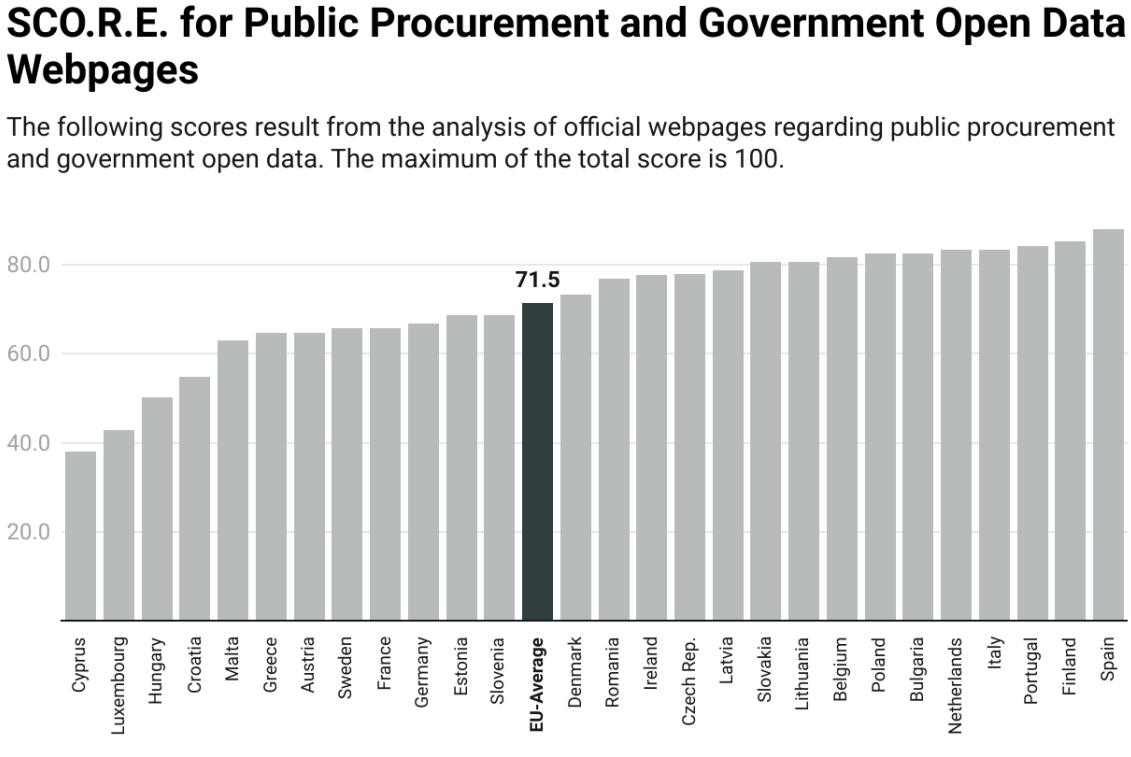
[1] $0,945x52 \approx 50$ points; $1,815x28 \approx 50$ points being the total score 100.

Three Levels of Good Practices

The results of the SCO.R.E. are represented in Figure 7.1 and the formula which based the calculus is the same introduced in subchapter 6.2. The index covers the constructs availability, interoperability, and re-usability for both public procurement as well as government open data webpages. The EU-average for the SCO.R.E. is 71.5 and it helps us create levels of good practices. Public contracting as well as government open data portals make use of digital functions and features in order to produce information on public contracting. With the purpose of reflecting these differences, we created an intermediate level between more and less appropriate good practices suggesting three levels of good practices. The first one brings those countries ranking from 0 to 60, the second between 60 to 80, and the third highest level for those scoring above 80. After calculating the SCO.R.E. for Croatia, Cyprus, Hungary and Luxembourg, we classify their public procurement and government open data portals as less appropriate good practices. They are below 60 points and more distant from the EU-average 71.5 as brought by Figure 7.2. Representing the intermediate level of the SCO.R.E., we have Austria, Czech Republic, Denmark, Estonia, France, Germany, Greece, Ireland, Latvia, Malta, Romania, Slovenia, and Sweden. The mid-level is maybe the most interesting one, because countries like Sweden and Denmark usually score very high in other indicators such as the Corruption Perceptions Index from the Transparency International and Administrative Burden which is part of a compound for the Index of Public Integrity developed by the European Re-

search Centre for Anti-Corruption and State-Building (ERCAS). Since our indicator relies solely on the assessment functions and features found on public procurement and government open data webpages, the mid-level countries may have a potential for transparency not yet fully employed by their digital mechanisms. Austria is a clear example of those countries scoring less, because of the access restrictions to contract data on e-procurement webpages, while Sweden only displays general information about tenders. Belgium, Bulgaria, Italy, Lithuania, Netherlands, Poland, Portugal, Slovakia, and Spain have obtained scores above 80 points in the SCO.R.E. meaning their public procurement and government open data webpages are more equipped with functions and features to fight corruption during emergency times.

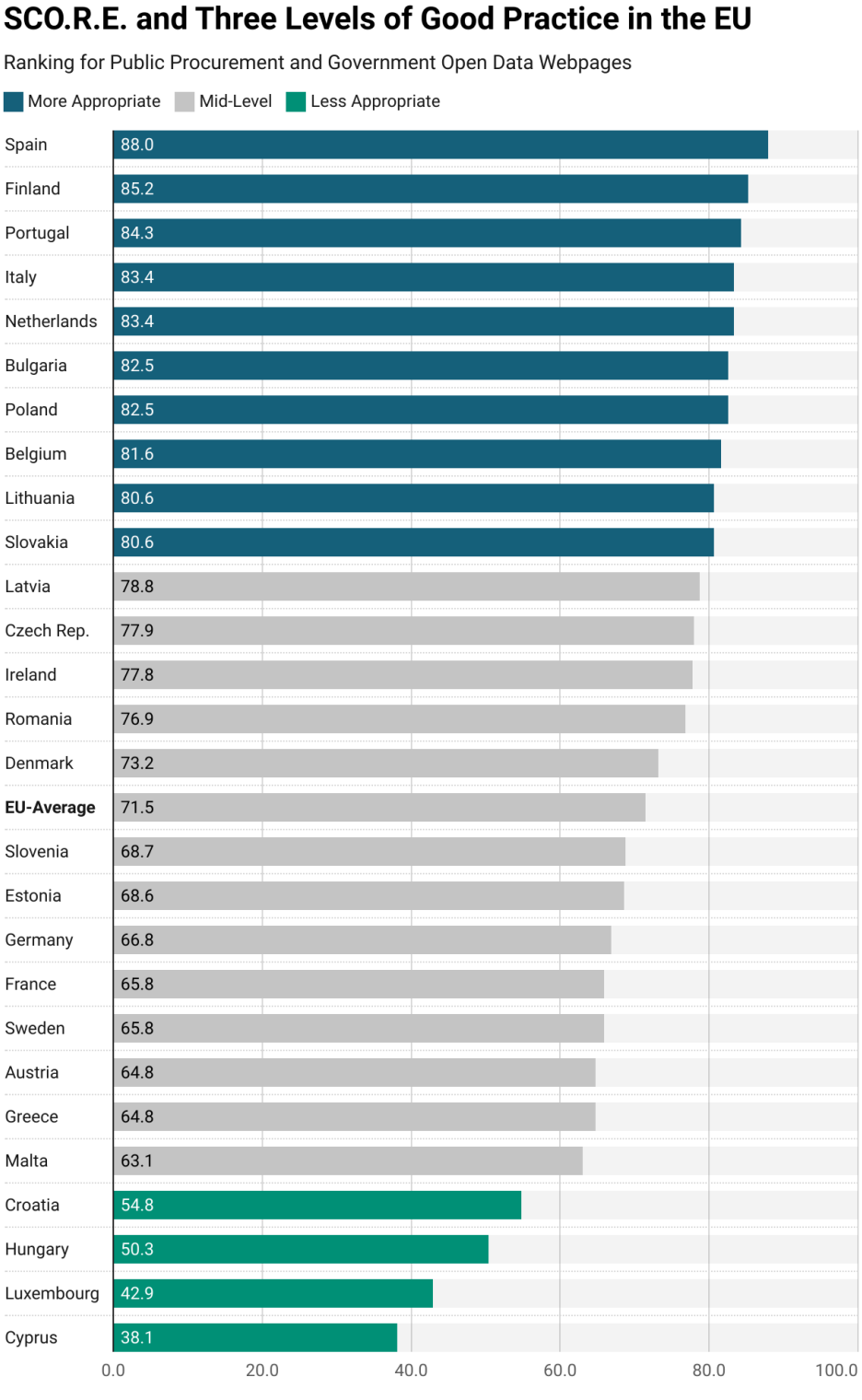
Figure 7.1: Public and good practices in the EU



Data collection and compilation produced by the Project COrruption Risk Indicators in Emergency (CO.R.E.). The inputs herein were extracted from the information available on official public procurement webpages and government open data portals for every country of the European Union..

Chart: W. Migliari • Source: Project COrruption Risk Indicators in Emergency • Created with Datawrapper

Figure 7.2: More, mid-level and less appropriate good practices



Data collected by the Project COrruption Risk Indicators in Emergency (CO.R.E.)

Chart: W. Migliari • Source: CO.R.E. • Created with Datawrapper

These countries usually disclose contract information on public procurement with copies of contract in which we can identify the bidders, their location, type of contract signed with the public authorities, number of contenders, contract amounts among other relevant information strengthening transparency in public administration. Tables 7.1, 7.2, 7.3, and 7.4 show how each country has scored in every construct and variable. All the 27 countries of the European Union were analyzed. The index is made of 12 constructs and 80 variables as Tables 7.5 and 7.6 show. The construct AA - Completeness refers to the Availability-Accessibility of information particularly related to contracts; AA - Easy Access to functions such as hyperlinks, buttons among other web functions on public procurement; and AA - Understandability concerning graphic, legal and contact features. Regarding the availability and quality of information on public, outputs on certified data, updates, as well as data format conform the A - Quality and A - Openness constructs. Interoperability and re-usability are, respectively, connected to the ubiquity of data on public tenders at different levels of public administration and to Application Programming Interfaces (APIs), metadata, and machine-readable data. ODP-AA-Easy Access stands for the Availability-Accessibility of information regarding the compiled data on public procurement available on the government open data webpages checking whether public tenders and adjudicated contracts, for example, are reflected on open data platforms such as data.europa.eu as well as national webpages. Similar to the other constructs applied to public procurement webpages, ODP-A-Quality and ODP-A-Openness display information on updates, data frequency, data format and so on. ODP-Interoperability and ODP-Re-usability identifies whether the data on public procurement is shared, integrated and downloadable easily from catalogues or repositories on government open data webpages concomitantly. In the case of re-usability, different from the construct applied to public procurement online portals, we included the variable eInvoicing Verified (EU) to establish an extra objective criterion linked to the verification of data on public procurement at the European level.

7.1 The disaggregation of the SCO.R.E.

Table 7.1: The SCO.R.E. for the 27 EU countries (I)

Constructs	Variables	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Rep.	Denmark
AAC-01:	Territorial Level (info) (01)	1	1	1	1	0	1	1
AAC-02:	Authority ID (02)	0	1	1	0	1	1	1
AAC-03:	Contract Object (03)	0	1	1	0	1	1	1
AAC-04:	Contract Amount (04)	0	1	1	0	1	1	1
AAC-05:	Contract ID/CPV/Case File (05)	0	1	1	0	0	1	1
AAC-06:	Contract Duration (06)	0	1	1	0	0	1	1
AAC-07:	Contract Type (07)	0	1	1	0	0	1	1
AAC-08:	Contract Updates (08)	0	1	1	0	0	1	1
AAC-09:	How many tenders? (09)	0	1	1	0	0	0	0
AAC-10:	Procedure (10)	1	1	1	1	1	1	1
AAC-11:	Emergency Justification (11)	0	1	1	0	0	0	1
AAC-12:	Open Tender Notice (12)	0	0	0	1	0	0	0
AAC-13:	Tender Name (13)	0	1	1	0	1	1	1
AAC-14:	Tender ID (14)	0	1	1	0	0	1	1
AAC-15:	Other Documents (Gov) (15)	0	1	1	0	0	1	1
AAC-16:	Aggregated Info (Contract Copy) (16)	0	1	1	0	0	1	0
AAEA-01:	Public Web (17)	1	1	1	1	1	1	1
AAEA-02:	Emergency Contract (Internal/External Web) (18)	1	0	0	0	0	0	0
AAEA-03:	Emergency Contracts (info) (19)	1	0	0	0	0	0	0
AAEA-04:	Info about Web/e-procurement (20)	1	1	1	1	1	1	1
AAEA-05:	Contact Channels (21)	1	1	1	1	1	1	1
AAEA-06:	FOIA/Transparency Act (22)	1	1	1	1	1	1	1
AAEA-07:	Hyperlinks/Icon Emergency (23)	1	0	0	0	0	0	0
AAEA-08:	Search Engine for the Contracts (24)	1	1	1	1	1	1	0
AAEA-09:	Information Structure (25)	1	1	1	1	1	1	1
AAEA-10:	Site Map (26)	0	0	1	0	0	0	0
AAEA-11:	Complaint Channel (27)	1	0	0	0	0	0	1
AAEA-12:	Anonymous Disclosure (28)	1	0	0	0	0	0	1
AAEA-13:	Whistleblowers Protection (29)	1	0	0	0	0	0	1
AAEA-14:	Data Protection (30)	1	1	1	1	0	0	1
AAEA-15:	Intellectual Property (31)	1	1	1	1	0	0	1
AAEA-16:	Help (32)	1	1	1	1	1	1	1
AAU-01:	Graphics (33)	1	1	1	0	0	1	0
AAU-02:	Info based on Directive (UE) 2016/2102 (34)	1	1	1	1	0	1	1
AAU-03:	Information Levels (35)	1	1	1	0	0	1	1
AAU-04:	Information Complexity (36)	1	1	1	0	0	1	1
AAU-05:	FAQs (37)	1	1	1	0	1	1	0
AQ-01:	Precise/Certified Data (38)	1	1	1	1	1	1	1
AQ-02:	Last Updates (39)	0	1	1	1	0	1	1
AQ-03:	Upadate Frequency (40)	0	1	1	1	0	1	1
AO-01:	Data Format (41)	0	1	1	0	0	1	1
AO-02:	Standard (42)	0	1	1	0	0	1	1
Inter-01:	Different Government Levels (43)	1	1	1	1	1	1	1
Inter-02:	Interoperability Standards (44)	0	1	1	0	0	1	1
Inter-03:	Hyperlinks to other Gov. Levels (45)	0	1	1	0	0	1	0
Re-Use-01:	API (46)	1	1	1	1	1	1	1
Re-Use-02:	Metadata (47)	1	1	1	1	1	1	1
Re-Use-03:	Information on Fees (48)	0	0	0	0	0	1	0
Re-Use-04:	Free Re-Use/Data Re-Use Licence (49)	0	1	1	0	1	1	1
Re-Use-05:	Machine-Readable Data (50)	0	1	1	0	1	1	1
ODP–01-AAEA:	Webpage (51)	1	1	1	1	1	1	1
ODP-02-AAEA:	data.europa.eu (EU) (52)	1	1	1	1	0	1	1
ODP-03-AAEA:	Contact Channels (53)	1	1	1	1	1	1	1
ODP-04-AAEA:	FOIA/Transparency Act (54)	1	1	1	1	1	1	0
ODP-05-AAEA:	Search Engine for the Data (55)	1	1	1	1	1	1	1
ODP-06-AAEA:	Information Structure (56)	1	1	1	1	1	1	1
ODP-07-AAEA:	Site Map (57)	0	0	0	0	0	0	0
ODP-08-AAEA:	Data Protection (58)	1	1	1	1	1	1	1
ODP-09-AAEA:	Intellectual Property (59)	1	1	1	1	1	1	1
ODP-10-AAEA:	Help (60)	1	1	1	1	1	1	1
ODP-11-A-Q:	Last Updates (61)	1	0	1	1	0	1	0
ODP-12-A-Q:	Updates Frequency (62)	1	0	1	1	0	1	0
ODP-13-A-O:	Data Format (63)	1	1	1	1	0	1	1
ODP-14-A-O:	Standard (64)	1	1	1	1	0	1	1
ODP-15-A-O:	Data Efficiency (65)	1	1	1	1	0	1	0
ODP-16-A-O:	Data on Emergency Contracts (66)	0	1	0	0	0	0	0
ODP-17-A-O:	Data at Different Administrative Levels (Regions/-Municipalities) (67)	0	0	0	0	0	0	0
ODP-18-Inter:	Sharing (68)	1	1	1	1	0	1	1
ODP-19-Inter:	Integrated (69)	1	1	1	1	0	1	1
ODP-20-Inter:	Different Government Levels (70)	1	1	1	1	0	1	1
ODP-21-Inter:	Interoperability Standards (71)	1	1	1	1	0	1	1
ODP-22-Inter:	Hyperlinks to other Gov. Levels (72)	1	1	1	1	0	1	1
ODP-26-Re-Use:	Downloadable and Easy to Mine (73)	0	1	1	1	0	1	0
ODP-26-Re-Use:	eInvoicing Verified (EU) (74)	1	1	0	1	0	0	1
ODP-26-Re-Use:	Administrative Capacity (EU) (75)	1	1	1	1	1	1	1
ODP-26-Re-Use:	API (76)	1	1	1	1	1	1	1
ODP-27-Re-Use:	Information on Fees (77)	1	1	1	1	1	1	1
ODP-28-Re-Use:	Free Re-Use/Data Re-Use Licence (78)	1	1	1	1	1	1	1
ODP-29-Re-Use:	Re-use conditions (79)	1	1	1	1	1	1	1
ODP-30-Re-Use:	Machine-Readable Data (80)	1	1	1	1	1	1	1
	SCO.R.E.	64.8	81.6	82.5	54.8	38.1	77.9	73.2

Table 7.2: The SCO.R.E. for the 27 EU countries (II)

Constructs	Variables	Estonia	Finland	France	Germany	Greece	Hungary	Ireland
AAC-01:	Territorial Level (info) (01)	1	1	1	1	1	1	1
AAC-02:	Authority ID (02)	1	1	1	1	1	1	1
AAC-03:	Contract Object (03)	1	1	1	1	1	1	1
AAC-04:	Contract Amount (04)	1	1	0	0	1	1	1
AAC-05:	Contract ID/CPV/Case File (05)	1	1	1	1	1	1	1
AAC-06:	Contract Duration (06)	1	1	0	1	0	1	1
AAC-07:	Contract Type (07)	1	1	0	0	0	1	1
AAC-08:	Contract Updates (08)	1	1	0	0	0	1	1
AAC-09:	How many tenders? (09)	0	1	0	0	0	0	0
AAC-10:	Procedure (10)	1	1	1	1	0	0	1
AAC-11:	Emergency Justification (11)	1	1	0	0	0	0	1
AAC-12:	Open Tender Notice (12)	0	0	0	0	0	0	0
AAC-13:	Tender Name (13)	1	1	0	0	0	1	1
AAC-14:	Tender ID (14)	1	1	0	0	0	1	1
AAC-15:	Other Documents (Gov) (15)	1	1	1	1	0	0	1
AAC-16:	Aggregated Info (Contract Copy) (16)	1	0	0	0	0	1	0
AAEA-01:	Public Web (17)	1	1	1	1	1	1	1
AAEA-02:	Emergency Contract (Internal/External Web) (18)	0	0	0	0	0	0	0
AAEA-03:	Emergency Contracts (info) (19)	1	0	0	0	0	0	1
AAEA-04:	Info about Web/e-procurement (20)	1	1	1	1	1	1	1
AAEA-05:	Contact Channels (21)	1	1	1	1	1	1	1
AAEA-06:	FOIA/Transparency Act (22)	1	1	0	1	1	1	1
AAEA-07:	Hyperlinks/Icon Emergency (23)	1	0	0	0	0	0	0
AAEA-08:	Search Engine for the Contracts (24)	1	1	1	1	1	1	1
AAEA-09:	Information Structure (25)	1	1	1	1	1	1	1
AAEA-10:	Site Map (26)	1	0	1	0	1	0	0
AAEA-11:	Complaint Channel (27)	0	1	0	0	0	1	0
AAEA-12:	Anonymous Disclosure (28)	0	1	0	0	0	1	0
AAEA-13:	Whistleblowers Protection (29)	0	1	0	0	0	1	0
AAEA-14:	Data Protection (30)	1	1	1	1	1	1	1
AAEA-15:	Intellectual Property (31)	1	1	1	1	1	1	1
AAEA-16:	Help (32)	1	1	1	1	1	1	1
AAU-01:	Graphics (33)	1	1	0	0	0	0	0
AAU-02:	Info based on Directive (UE) 2016/2102 (34)	1	1	1	1	1	1	1
AAU-03:	Information Levels (35)	1	1	1	1	1	1	1
AAU-04:	Information Complexity (36)	1	1	1	1	1	1	1
AAU-05:	FAQs (37)	1	1	1	1	1	0	1
AQ-01:	Precise/Certified Data (38)	1	1	1	1	1	1	1
AQ-02:	Last Updates (39)	1	1	0	0	1	0	1
AQ-03:	Upadate Frequency (40)	1	1	0	0	1	0	1
AO-01:	Data Format (41)	1	1	1	1	1	1	1
AO-02:	Standard (42)	1	1	1	1	1	1	1
Inter-01:	Different Government Levels (43)	1	1	1	1	1	1	1
Inter-02:	Interoperability Standards (44)	1	1	0	0	0	0	1
Inter-03:	Hyperlinks to other Gov. Levels (45)	1	1	0	0	0	0	1
Re-Use-01:	API (46)	1	1	1	1	1	1	1
Re-Use-02:	Metadata (47)	1	1	1	1	1	1	1
Re-Use-03:	Information on Fees (48)	0	0	0	0	0	1	0
Re-Use-04:	Free Re-Use/Data Re-Use Licence (49)	1	1	1	1	1	1	1
Re-Use-05:	Machine-Readable Data (50)	1	1	1	1	1	1	1
ODP–01-AAEA:	Webpage (51)	1	1	1	1	1	1	1
ODP-02-AAEA:	data.europa.eu (EU) (52)	0	1	1	1	1	0	1
ODP-03-AAEA:	Contact Channels (53)	1	1	1	1	0	0	1
ODP-04-AAEA:	FOIA/Transparency Act (54)	0	1	1	1	1	0	1
ODP-05-AAEA:	Search Engine for the Data (55)	1	1	1	1	1	1	1
ODP-06-AAEA:	Information Structure (56)	1	1	1	1	1	1	1
ODP-07-AAEA:	Site Map (57)	0	0	0	1	0	0	0
ODP-08-AAEA:	Data Protection (58)	1	1	1	1	1	0	1
ODP-09-AAEA:	Intellectual Property (59)	1	1	1	1	1	0	1
ODP-10-AAEA:	Help (60)	1	1	1	1	0	0	1
ODP-11-A-Q:	Last Updates (61)	0	1	1	1	1	0	0
ODP-12-A-Q:	Updates Frequency (62)	0	1	1	1	1	0	0
ODP-13-A-O:	Data Format (63)	0	1	1	1	1	0	1
ODP-14-A-O:	Standard (64)	0	1	1	1	1	0	1
ODP-15-A-O:	Data Efficiency (65)	0	1	1	1	0	0	1
ODP-16-A-O:	Data on Emergency Contracts (66)	0	0	0	0	0	0	0
ODP-17-A-O:	Data at Different Administrative Levels (Regions/Municipalities) (67)	0	0	1	1	0	0	0
ODP-18-Inter:	Sharing (68)	0	1	1	1	1	0	1
ODP-19-Inter:	Integrated (69)	0	1	1	1	1	0	1
ODP-20-Inter:	Different Government Levels (70)	0	1	1	1	1	0	1
ODP-21-Inter:	Interoperability Standards (71)	0	1	1	1	1	0	1
ODP-22-Inter:	Hyperlinks to other Gov. Levels (72)	0	1	1	1	1	0	1
ODP-26-Re-Use:	Downloadable and Easy to Mine (73)	0	0	1	0	0	0	0
ODP-26-Re-Use:	eInvoicing Verified (EU) (74)	0	1	0	0	1	0	1
ODP-26-Re-Use:	Administrative Capacity (EU) (75)	1	1	1	1	1	1	1
ODP-26-Re-Use:	API (76)	1	1	1	1	1	1	1
ODP-27-Re-Use:	Information on Fees (77)	1	1	1	1	1	1	1
ODP-28-Re-Use:	Free Re-Use/Data Re-Use Licence (78)	1	1	1	1	1	1	1
ODP-29-Re-Use:	Re-use conditions (79)	1	1	1	1	1	1	1
ODP-30-Re-Use:	Machine-Readable Data (80)	1	1	1	1	1	1	1
	SCO.R.E.	68.6	85.2	65.8	66.8	64.8	50.3	77.8

Table 7.3: The SCO.R.E. for the 27 EU countries (III)

Constructs	Variables	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland
AAC-01:	Territorial Level (info) (01)	0	1	1	1	1	1	1
AAC-02:	Authority ID (02)	1	1	1	1	1	1	1
AAC-03:	Contract Object (03)	1	1	1	1	1	1	1
AAC-04:	Contract Amount (04)	1	1	1	0	1	1	1
AAC-05:	Contract ID/CPV/Case File (05)	1	1	1	1	1	1	1
AAC-06:	Contract Duration (06)	1	1	1	0	0	1	1
AAC-07:	Contract Type (07)	1	1	1	1	1	1	1
AAC-08:	Contract Updates (08)	1	1	1	0	1	1	1
AAC-09:	How many tenders? (09)	1	1	1	0	1	1	1
AAC-10:	Procedure (10)	1	1	1	1	1	1	1
AAC-11:	Emergency Justification (11)	1	1	0	0	0	0	0
AAC-12:	Open Tender Notice (12)	0	0	0	0	0	0	0
AAC-13:	Tender Name (13)	1	1	1	0	1	1	1
AAC-14:	Tender ID (14)	1	1	1	0	1	1	1
AAC-15:	Other Documents (Gov) (15)	1	1	1	1	1	1	1
AAC-16:	Aggregated Info (Contract Copy) (16)	1	1	0	0	0	0	1
AAEA-01:	Public Web (17)	1	1	1	1	1	1	1
AAEA-02:	Emergency Contract (Internal/External Web) (18)	0	0	0	0	0	0	0
AAEA-03:	Emergency Contracts (info) (19)	0	0	0	0	0	0	1
AAEA-04:	Info about Web/e-procurement (20)	1	1	1	1	1	1	1
AAEA-05:	Contact Channels (21)	1	1	1	1	1	1	1
AAEA-06:	FOIA/Transparency Act (22)	1	1	1	0	1	1	1
AAEA-07:	Hyperlinks/Icon Emergency (23)	0	0	0	0	0	0	1
AAEA-08:	Search Engine for the Contracts (24)	1	1	1	1	1	1	1
AAEA-09:	Information Structure (25)	1	1	1	1	1	1	1
AAEA-10:	Site Map (26)	0	0	0	0	0	0	1
AAEA-11:	Complaint Channel (27)	1	0	1	0	0	1	0
AAEA-12:	Anonymous Disclosure (28)	1	0	0	0	0	0	0
AAEA-13:	Whistleblowers Protection (29)	1	0	0	0	0	0	0
AAEA-14:	Data Protection (30)	1	1	1	1	1	1	1
AAEA-15:	Intellectual Property (31)	1	1	1	1	1	1	1
AAEA-16:	Help (32)	1	1	1	1	1	1	0
AAU-01:	Graphics (33)	1	0	0	0	0	1	0
AAU-02:	Info based on Directive (UE) 2016/2102 (34)	1	1	1	0	1	1	1
AAU-03:	Information Levels (35)	1	1	1	0	1	1	1
AAU-04:	Information Complexity (36)	0	0	1	0	1	1	1
AAU-05:	FAQs (37)	1	0	1	0	1	1	0
AQ-01:	Precise/Certified Data (38)	1	1	1	1	1	1	1
AQ-02:	Last Updates (39)	1	1	1	0	1	1	1
AQ-03:	Upadate Frequency (40)	1	1	1	0	1	1	1
AO-01:	Data Format (41)	1	1	1	1	1	1	1
AO-02:	Standard (42)	1	1	1	1	1	1	1
Inter-01:	Different Government Levels (43)	1	1	1	1	1	1	1
Inter-02:	Interoperability Standards (44)	1	1	1	0	1	1	1
Inter-03:	Hyperlinks to other Gov. Levels (45)	1	1	1	0	1	1	1
Re-Use-01:	API (46)	1	1	1	1	1	1	1
Re-Use-02:	Metadata (47)	1	1	1	1	1	1	1
Re-Use-03:	Information on Fees (48)	0	0	0	0	0	0	0
Re-Use-04:	Free Re-Use/Data Re-Use Licence (49)	1	1	1	1	1	1	1
Re-Use-05:	Machine-Readable Data (50)	1	1	1	1	1	1	1
ODP–01-AAEA:	Webpage (51)	1	1	1	1	1	1	1
ODP-02-AAEA:	data.europa.eu (EU) (52)	1	1	1	1	1	1	1
ODP-03-AAEA:	Contact Channels (53)	1	1	1	1	1	1	1
ODP-04-AAEA:	FOIA/Transparency Act (54)	1	1	1	1	1	1	1
ODP-05-AAEA:	Search Engine for the Data (55)	1	1	1	1	1	1	1
ODP-06-AAEA:	Information Structure (56)	1	1	1	1	1	1	1
ODP-07-AAEA:	Site Map (57)	0	0	0	0	0	0	1
ODP-08-AAEA:	Data Protection (58)	1	1	1	1	1	1	1
ODP-09-AAEA:	Intellectual Property (59)	1	1	1	1	1	1	1
ODP-10-AAEA:	Help (60)	1	1	1	1	1	1	1
ODP-11-A-Q:	Last Updates (61)	1	1	1	0	0	1	1
ODP-12-A-Q:	Updates Frequency (62)	1	1	1	0	0	1	1
ODP-13-A-O:	Data Format (63)	1	1	1	0	0	1	1
ODP-14-A-O:	Standard (64)	1	1	1	0	0	1	1
ODP-15-A-O:	Data Efficiency (65)	1	1	1	0	0	1	1
ODP-16-A-O:	Data on Emergency Contracts (66)	0	0	0	0	0	0	0
ODP-17-A-O:	Data at Different Administrative Levels (Regions/Municipalities) (67)	0	1	1	0	0	1	0
ODP-18-Inter:	Sharing (68)	1	1	1	0	0	1	1
ODP-19-Inter:	Integrated (69)	1	1	1	0	0	1	1
ODP-20-Inter:	Different Government Levels (70)	1	1	1	0	0	1	1
ODP-21-Inter:	Interoperability Standards (71)	1	1	1	0	0	1	1
ODP-22-Inter:	Hyperlinks to other Gov. Levels (72)	1	1	1	0	0	1	1
ODP-26-Re-Use:	Downloadable and Easy to Mine (73)	0	1	1	0	0	1	0
ODP-26-Re-Use:	eInvoicing Verified (EU) (74)	1	0	0	0	1	1	1
ODP-26-Re-Use:	Administrative Capacity (EU) (75)	1	1	1	1	1	1	1
ODP-26-Re-Use:	API (76)	1	1	1	1	0	1	1
ODP-27-Re-Use:	Information on Fees (77)	1	1	1	1	1	1	1
ODP-28-Re-Use:	Free Re-Use/Data Re-Use Licence (78)	1	1	1	1	1	1	1
ODP-29-Re-Use:	Re-use conditions (79)	1	1	1	1	1	1	1
ODP-30-Re-Use:	Machine-Readable Data (80)	1	1	1	1	1	1	1
	SCO.R.E.	83.4	78.8	80.6	42.9	63.1	83.4	82.5

Table 7.4: The SCO.R.E. for the 27 EU countries (IV)

Constructs	Variables	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden
AAC-01:	Territorial Level (info) (01)	1	1	1	1	1	1
AAC-02:	Authority ID (02)	1	1	1	1	1	1
AAC-03:	Contract Object (03)	1	1	1	1	1	1
AAC-04:	Contract Amount (04)	1	1	1	1	1	1
AAC-05:	Contract ID/CPV/Case File (05)	1	1	1	1	1	1
AAC-06:	Contract Duration (06)	1	1	1	1	1	1
AAC-07:	Contract Type (07)	1	1	1	1	1	1
AAC-08:	Contract Updates (08)	1	1	1	1	1	1
AAC-09:	How many tenders? (09)	1	0	1	1	1	0
AAC-10:	Procedure (10)	1	1	1	1	1	1
AAC-11:	Emergency Justification (11)	0	0	0	0	1	0
AAC-12:	Open Tender Notice (12)	0	0	0	0	0	0
AAC-13:	Tender Name (13)	1	0	1	1	1	0
AAC-14:	Tender ID (14)	1	0	1	1	1	0
AAC-15:	Other Documents (Gov) (15)	1	1	1	1	1	0
AAC-16:	Aggregated Info (Contract Copy) (16)	1	1	1	1	1	0
AAEA-01:	Public Web (17)	1	1	1	1	1	1
AAEA-02:	Emergency Contract (Internal/External Web) (18)	0	0	0	0	0	0
AAEA-03:	Emergency Contracts (info) (19)	1	1	1	1	0	0
AAEA-04:	Info about Web/e-procurement (20)	1	1	1	1	1	1
AAEA-05:	Contact Channels (21)	1	1	1	1	1	1
AAEA-06:	FOIA/Transparency Act (22)	1	1	1	1	1	1
AAEA-07:	Hyperlinks/Icon Emergency (23)	0	0	0	0	0	0
AAEA-08:	Search Engine for the Contracts (24)	1	1	1	1	1	1
AAEA-09:	Information Structure (25)	1	1	1	1	1	1
AAEA-10:	Site Map (26)	1	0	1	1	1	0
AAEA-11:	Complaint Channel (27)	1	0	0	0	0	0
AAEA-12:	Anonymous Disclosure (28)	0	0	0	0	0	0
AAEA-13:	Whistleblowers Protection (29)	0	0	0	0	0	0
AAEA-14:	Data Protection (30)	1	1	1	1	1	1
AAEA-15:	Intellectual Property (31)	1	1	1	1	1	1
AAEA-16:	Help (32)	0	0	0	1	1	1
AAU-01:	Graphics (33)	1	0	0	1	0	0
AAU-02:	Info based on Directive (UE) 2016/2102 (34)	1	1	1	1	1	1
AAU-03:	Information Levels (35)	1	1	1	1	1	1
AAU-04:	Information Complexity (36)	1	1	1	1	1	1
AAU-05:	FAQs (37)	1	1	1	1	1	1
AQ-01:	Precise/Certified Data (38)	1	1	1	1	1	1
AQ-02:	Last Updates (39)	1	1	1	1	1	1
AQ-03:	Upadate Frequency (40)	1	0	0	1	1	1
AO-01:	Data Format (41)	1	1	1	1	1	1
AO-02:	Standard (42)	1	1	1	1	1	1
Inter-01:	Different Government Levels (43)	1	1	1	1	1	1
Inter-02:	Interoperability Standards (44)	1	1	1	1	1	0
Inter-03:	Hyperlinks to other Gov. Levels (45)	1	0	1	1	1	0
Re-Use-01:	API (46)	1	1	1	1	1	1
Re-Use-02:	Metadata (47)	1	1	1	1	1	1
Re-Use-03:	Information on Fees (48)	0	0	0	0	0	0
Re-Use-04:	Free Re-Use/Data Re-Use Licence (49)	1	1	1	1	1	1
Re-Use-05:	Machine-Readable Data (50)	1	1	1	1	1	1
ODP–01-AAEA:	Webpage (51)	1	1	1	1	1	1
ODP-02-AAEA:	data.europa.eu (EU) (52)	1	1	1	1	1	1
ODP-03-AAEA:	Contact Channels (53)	1	1	1	1	1	1
ODP-04-AAEA:	FOIA/Transparency Act (54)	1	1	1	1	1	1
ODP-05-AAEA:	Search Engine for the Data (55)	1	1	1	1	1	1
ODP-06-AAEA:	Information Structure (56)	1	1	1	1	1	1
ODP-07-AAEA:	Site Map (57)	0	0	1	0	1	0
ODP-08-AAEA:	Data Protection (58)	1	1	1	1	1	1
ODP-09-AAEA:	Intellectual Property (59)	1	1	1	1	1	1
ODP-10-AAEA:	Help (60)	1	1	1	1	1	1
ODP-11-A-Q:	Last Updates (61)	1	1	1	0	1	0
ODP-12-A-Q:	Updates Frequency (62)	1	1	0	0	1	0
ODP-13-A-O:	Data Format (63)	1	1	1	0	1	1
ODP-14-A-O:	Standard (64)	1	1	1	0	1	1
ODP-15-A-O:	Data Efficiency (65)	1	1	1	0	1	1
ODP-16-A-O:	Data on Emergency Contracts (66)	0	0	0	0	1	0
ODP-17-A-O:	Data at Different Administrative Levels (Regions/Municipalities) (67)	1	1	1	0	1	0
ODP-18-Inter:	Sharing (68)	1	1	1	0	1	0
ODP-19-Inter:	Integrated (69)	1	1	1	0	1	0
ODP-20-Inter:	Different Government Levels (70)	1	1	1	0	1	1
ODP-21-Inter:	Interoperability Standards (71)	1	1	1	0	1	1
ODP-22-Inter:	Hyperlinks to other Gov. Levels (72)	1	1	1	0	1	1
ODP-26-Re-Use:	Downloadable and Easy to Mine (73)	1	1	0	0	1	0
ODP-26-Re-Use:	eInvoicing Verified (EU) (74)	0	1	1	1	1	1
ODP-26-Re-Use:	Administrative Capacity (EU) (75)	1	1	1	1	1	1
ODP-26-Re-Use:	API (76)	1	1	1	0	1	1
ODP-27-Re-Use:	Information on Fees (77)	1	1	1	1	1	1
ODP-28-Re-Use:	Free Re-Use/Data Re-Use Licence (78)	1	1	1	1	1	1
ODP-29-Re-Use:	Re-use conditions (79)	1	1	1	1	1	1
ODP-30-Re-Use:	Machine-Readable Data (80)	1	1	1	1	1	1
	SCO.R.E.	84.3	76.9	80.6	68.7	88.0	65.8

Table 7.5: The SCO.R.E.: constructs and variables (I)

Constructs and variables CO.R.E.

	Construct	Variable
1	AA - Completeness	Territorial Level (info)
	AA - Completeness	Authority ID
	AA - Completeness	Contract Object
	AA - Completeness	Contract Amount
	AA - Completeness	Contract ID/CPV/Case File
	AA - Completeness	Contract Duration
	AA - Completeness	Contract Type
	AA - Completeness	Contract Updates
	AA - Completeness	How many tenders?
	AA - Completeness	Procedure
	AA - Completeness	Emergency Justification
	AA - Completeness	Open Tender Notice
	AA - Completeness	Tender Name
	AA - Completeness	Tender ID
	AA - Completeness	Other Documents (Gov)
	AA - Completeness	Aggregated Info (Contract Copy)
2	AA - Easy Access	Public Web
	AA - Easy Access	Emergency Contract (Internal/External Web)
	AA - Easy Access	Emergency Contracts (Info)
	AA - Easy Access	Info about Web/e-procurement
	AA - Easy Access	Contact Channels
	AA - Easy Access	FOIA/Transparency Act
	AA - Easy Access	Hyperlinks/Icon Emergency
	AA - Easy Access	Search Engine for the Contracts
	AA - Easy Access	Information Structure
	AA - Easy Access	Site Map
	AA - Easy Access	Complaint Channel
	AA - Easy Access	Anonymous Disclosure
	AA - Easy Access	Whistleblowers Protection
	AA - Easy Access	Data Protection
	AA - Easy Access	Intellectual Property
	AA - Easy Access	Help
3	AA - Understandability	Graphics
	AA - Understandability	Info based on Directive (UE) 2016/2102
	AA - Understandability	Information Levels
	AA - Understandability	Information Complexity
	AA - Understandability	FAQs

Table 7.6: The SCO.R.E.: constructs and variables (II)

4	A - Quality	Precise/Certified Data
	A - Quality	Last Updates
	A - Quality	Update Frequency
5	A - Openness	Data Format
	A - Openness	Standard
6	Interoperability	Different Government Levels
	Interoperability	Interoperability Standards
	Interoperability	Hyperlinks to other Gov. Levels
7	Re-usability	API
	Re-usability	Metadata
	Re-usability	Information on Fees
	Re-usability	Free Re-use/Data Re-use Licence
	Re-usability	Machine-Readable Data
8	ODP-AA-Easy Access	Webpage
	ODP-AA-Easy Access	data.europa.eu (EU)
	ODP-AA-Easy Access	Contact Channels
	ODP-AA-Easy Access	FOIA/Transparency Act
	ODP-AA-Easy Access	Search Engine for the Data
	ODP-AA-Easy Access	Information Structure
	ODP-AA-Easy Access	Site Map
	ODP-AA-Easy Access	Data Protection
	ODP-AA-Easy Access	Intellectual Property
	ODP-AA-Easy Access	Help
9	ODP-A-Quality	Last Updates
	ODP-A-Quality	Updates Frequency
10	ODP-A-Openness	Data Format
	ODP-A-Openness	Standard
	ODP-A-Openness	Data Efficiency
	ODP-A-Openness	Data on Emergency Contracts
	ODP-A-Openness	Data at Different Administrative Levels (Regions/Municipalities)
11	ODP-Interoperability	Sharing
	ODP-Interoperability	Integrated
	ODP-Interoperability	Different Government Levels
	ODP-Interoperability	Interoperability Standards
	ODP-Interoperability	Hyperlinks to other Gov. Levels
12	ODP-Re-usability	Downloadable and Easy to Mine
	ODP-Re-usability	eInvoicing Verified (EU)
	ODP-Re-usability	Administrative Capacity (EU)
	ODP-Re-usability	API
	ODP-Re-usability	Information on Fees
	ODP-Re-usability	Free Re-use/Data Re-use Licence
	ODP-Re-usability	Re-use conditions
	ODP-Re-usability	Machine-Readable Data

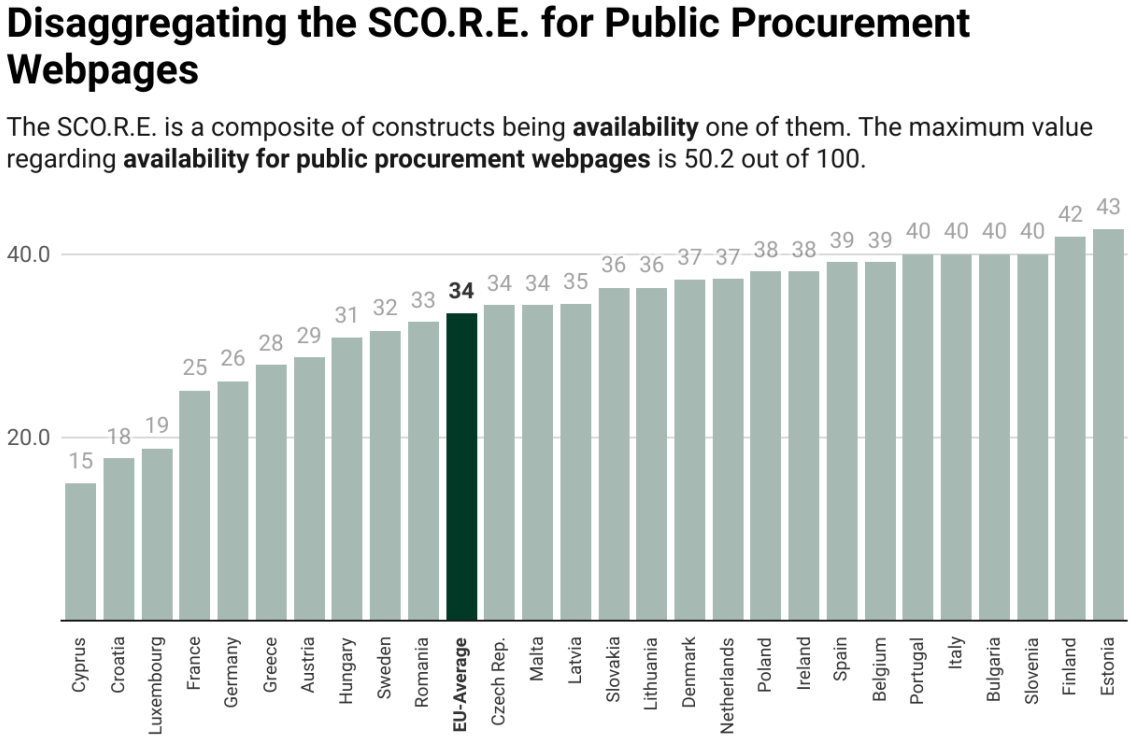
The maximum total sum for the SCO.R.E. is 100 and it is important to understand that our indicator calculates not only the risk of corruption for public procurement and government open data webpages for ordinary tenders. **It is sensitive to those digital functions and features indispensable for public under emergency times**. The following Figures 7.3, 7.4, 7.5, 7.6, 7.7, and 7.8 disaggregate the index to clarify how countries have performed in every construct.

7.1.1 Public procurement webpages: availability

In the SCO.R.E. model, Availability-Accessibility is a construct subdivided into 5 domains: 1) Availability-Accessibility Completeness measures the contract information available on public procurement webpages; 2) Availability-Accessibility Easy Access identifies if the web is capable to facilitate the access to information through functions like search engine, hyperlinks to other websites related to public, legislation on transparency among others; 3) Availability-Accessibility Understandability refers to quantitative information as graphics, qualitative information on public procurement according to the Directive (UE) 2016/2102 and FAQs; 4) Availability-Quality identifies if the data on public contracts, for instance, are certified and update; and 5) Availability-Openness checking if data format follows the standard established by the EU. As seen in Tables 7.1, 7.2, 7.3, and 7.4, the countries appearing below the EU-average for this construct like Austria, Croatia, Cyprus, France, Germany, Greece, Hungary, Luxembourg, Romania, and Sweden have potential to make more data available on public contracts, connect the tender announcement on e-procurement webpages to the authority through hyperlinks and make possible the traceability of which business is being conducted. The information involving the contract amounts can be more complete. On the other hand, Estonia, Italy, Portugal, Slovakia, and Spain among other countries have more complete functions and features concerning e-procurement with clickable links and buttons that make possible explore deeply the information on public contracts. In this construct, the score reflects also significant changes and adaptations complying with the EU legal framework during the last years. Regarding the variables Emergency Contract (Internal/External Web) and Emergency Contracts

(Info), functions and features were not found for Denmark and Finland. The EU-average for this construct is 34.

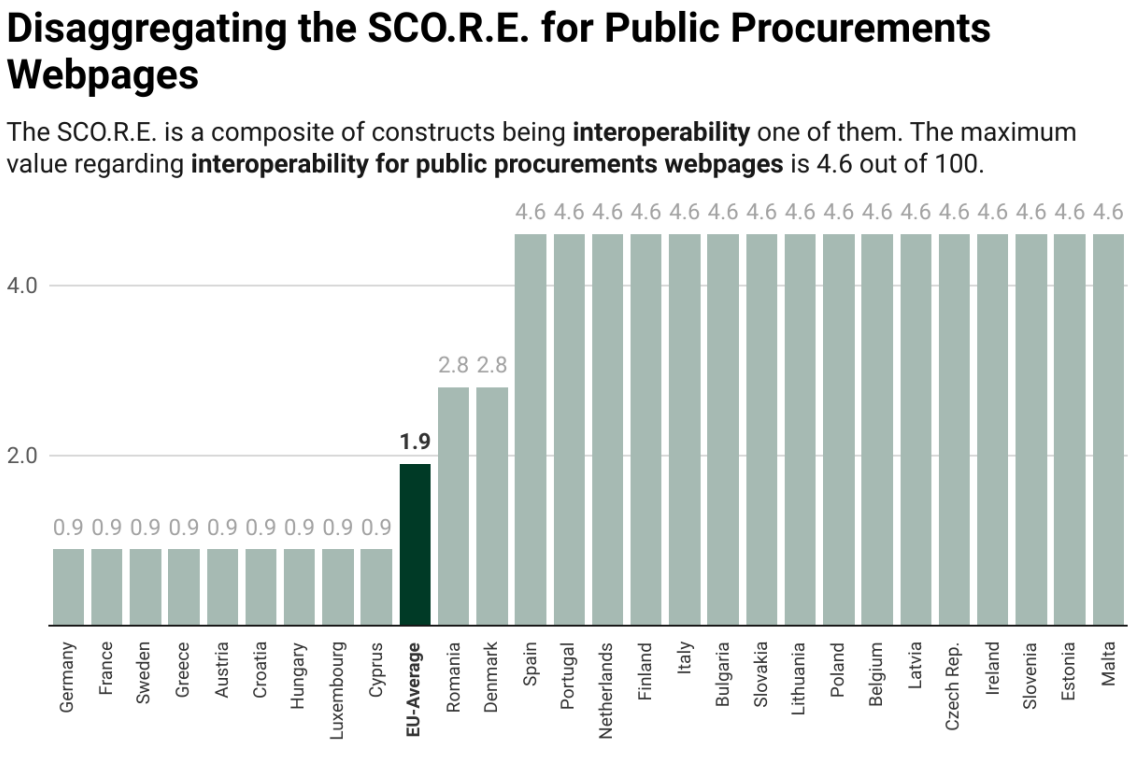
Figure 7.3: Availability on public procurement webpages in the EU



7.1.2 Public Procurement webpages: interoperability

Austria, Croatia, Cyprus, France, Germany, Greece, Hungary, Luxembourg, and Sweden have diminished their potential to score more in interoperability, because in this construct reflects whether interoperable data on public procurement is available at different government levels, follows interoperability standards and facilitates hyperlinks to other levels of government or authorities.

Figure 7.4: Interoperability on public procurement webpages in the EU



Data collection and compilation produced by the Project COrruption Risk Indicators in Emergency (CO.R.E.). The inputs herein were extracted from the analysis of official webpages for public procurement portals for every country of the European Union.

Chart: W. Migliari • Source: Project COrruption Risk Indicators in Emergency • Created with Datawrapper

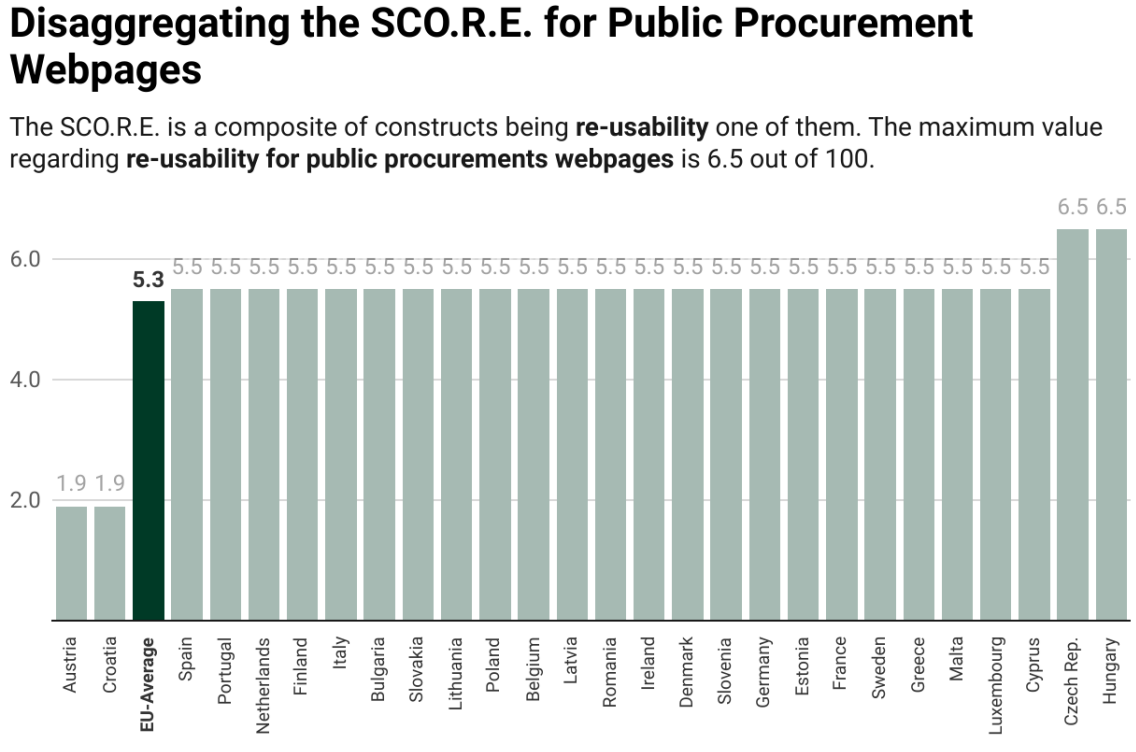
Romania has performed better interoperable data and interoperability standards on public procurement meaning that the same call for a specific tender appears simultaneously on different e-procurement webpages. The existence of hyperlinks as a function to enhance tender traceability could improve the Romanian score. The EU-average for this construct is 1.9 and Southern European countries like Italy, Portugal and Spain are some of the most interoperable public procurement webpages as it is shown in Figure 7.4.

7.1.3 Public procurement webpages: re-usability

The construct Re-usability identifies the presence of API, metadata, and the Information on fees vis-à-vis the demand for public procurement data. It also checks the free re-usability of data or instructions regarding licence

for data re-usability as well as whether the available data on public contracts is machine-readable.

Figure 7.5: Re-usability on public procurement webpages in the EU



Data collection and compilation produced by the Project COrruption Risk Indicators in Emergency (CO.R.E.). The inputs herein were extracted from the analysis of official webpages for public procurement portals for every country of the European Union.

Chart: W. Migliari • Source: Project COrruption Risk Indicators in Emergency • Created with Datawrapper

Compared to the EU-average 5.3, Austria and Croatia have scored less. This usually happens when the functions and features of public procurement webpages cannot lead the user to more details on fees in case of data requirement, how the free re-usability of data can be made nor bring information about the type of licence permits the data re-usability. The full re-usability of information through machine-readable data is another issue Austria and Croatia have. It is common the presence of documents like reports and figures on data re-usability, but these documents are limited to trend lines and numbers plotted in pdf format. Figure 7.5 shows the results for all the EU countries. The Austrian case is peculiar when we started analyzing the re-

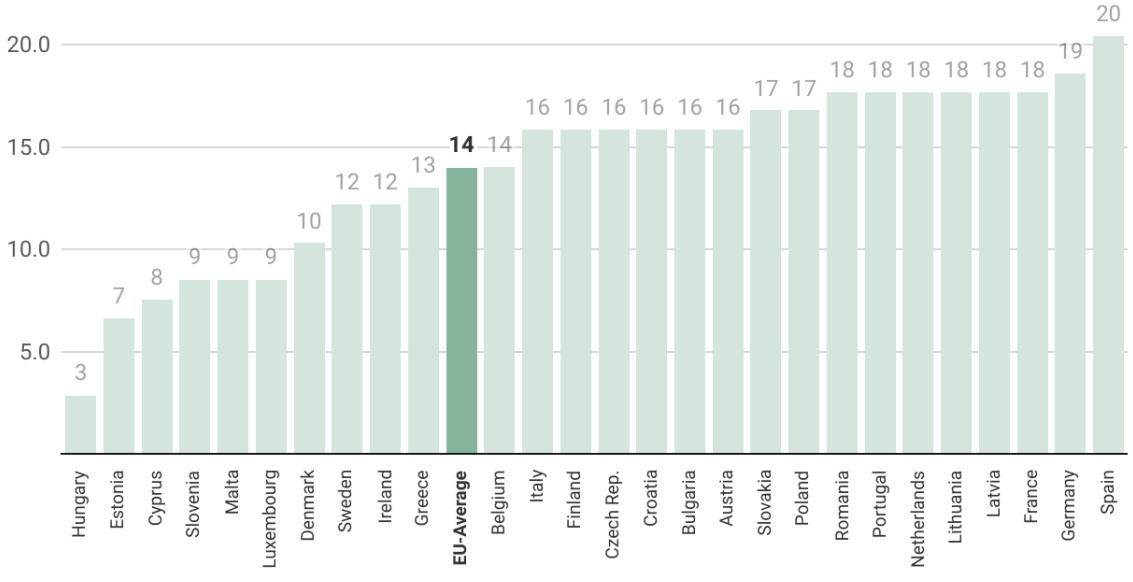
usability of data on public contracts. Its e-procurement webpage is apparently complete, but relevant functions and features are controlled by previous registration.[1]

7.1.4 Government open data webpages: availability

The construct Availability-Accessibility is also applied to the government open data webpages. However, three domains were employed instead of five as follows: 1) Availability-Accessibility Easy Access; 2) Availability-Quality; and 3) Availability-Openness. For Availability-Accessibility Easy Access, we investigated if the countries have official webpages dedicated to and catalogues on data.europa.eu portal. Another important variable in this domain checks whether the government open data webpages have functions facilitating the communication between public authorities and companies through contact channels. The other variables are related to the quantity of information on transparency legislation, search engines on the web portals, how the information is structured through links and buttons, site map, instructions on data protection, legal advice about intellectual property and professional support with a help desk. The updates of data sets, for instance, are controlled by the domain Availability-Quality. Availability-Openness refers to the data format, the minimum standards for public contract data in different extensions like xlsx, csv or xml, and the efficiency in connecting the most updated information about emergency contracts at different levels of the public administration. The EU-average for the construct Availability-Accessibility is 14 with ten countries below this benchmark. The webpages of Cyprus, Denmark, Estonia, Greece, Hungary, Ireland, Luxembourg, Malta, Slovenia and Sweden have shown weak points in for the variables Last Updates, Updates Frequency, Data on Emergency Contracts and Data at Different Administrative Levels (Regions/Municipalities), These flaws in compiling public procurement data sets and making them available on government open data webpages have affected more negatively the performance of Cyprus, Estonia and Hungary.

[1] We tried to register the SCO.R.E. on the Austrian e-procurement webpage, but without success. The purpose of the page is basically designed for individuals and companies offering goods and services for public authorities. The limitation to public procurement data can produce higher scores for countries ranking in lower position in other indexes like Transparency International and Index of Public Integrity. We will discuss this aspect in subchapter 8.2.1.1.

Figure 7.6: Availability on government open data webpages in the EU



Data collection and compilation produced by the Project COrruption Risk Indicators in Emergency (CO.R.E.). The inputs herein were extracted from the analysis of official open data portals for every country of the European Union.

Chart: W. Migliari • Source: Project COrruption Risk Indicators in Emergency • Created with Datawrapper

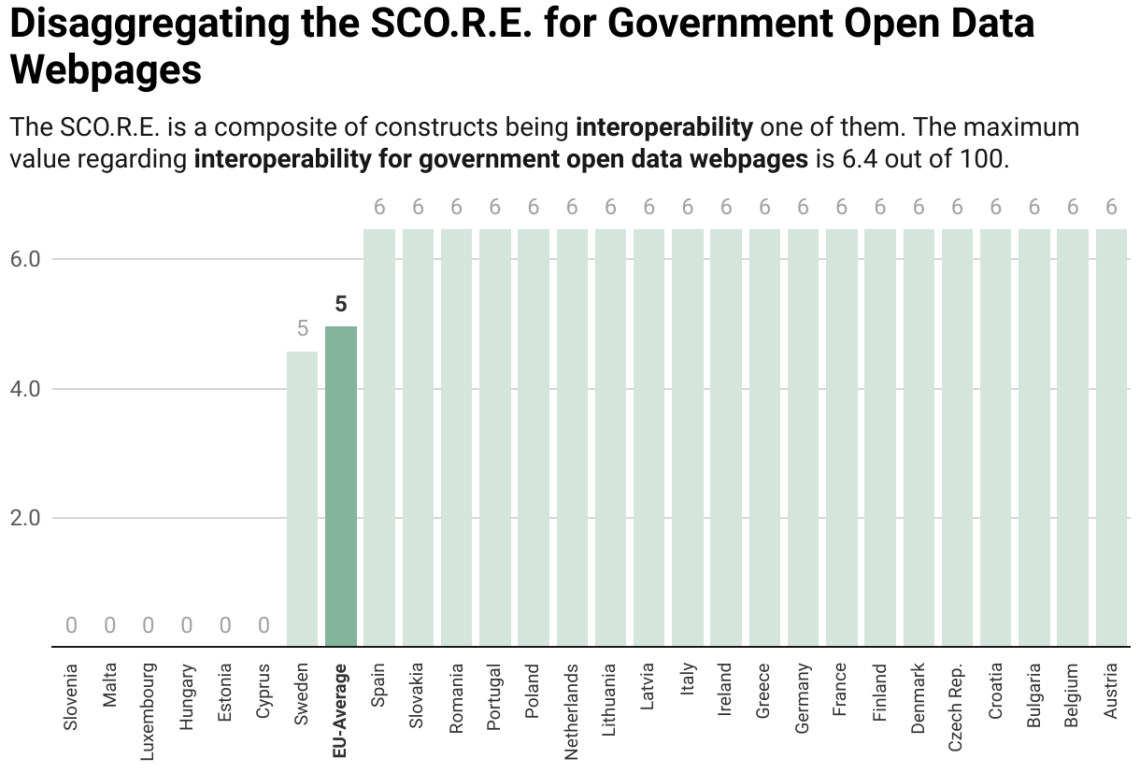
Other government open data webpages like the Swedish and Danish ones have an unexplored potential that may improve their and openness specifically on emergency contracts data. Figure 7.6 shows the results for the construct Availability-Accessibility with France, Germany and Spain leading the ranking at this stage. These countries have found different ways to link the information on public contracts systematizing them in format with long data sets covering specially the pandemic years caused by the virus SARS-CoV-2.

7.1.5 Government open data webpages: interoperability

The construct Interoperability checks whether government open data webpages are sharing and integrating their data sets. Cyprus, Estonia and Hungary show no catalogues available on data.europa.eu. The fact of not having

catalogues interoperable on a European portal eventually has an extreme negative effect on the performance of the countries resulting in no points.

Figure 7.7: Interoperability on government open data webpages in the EU



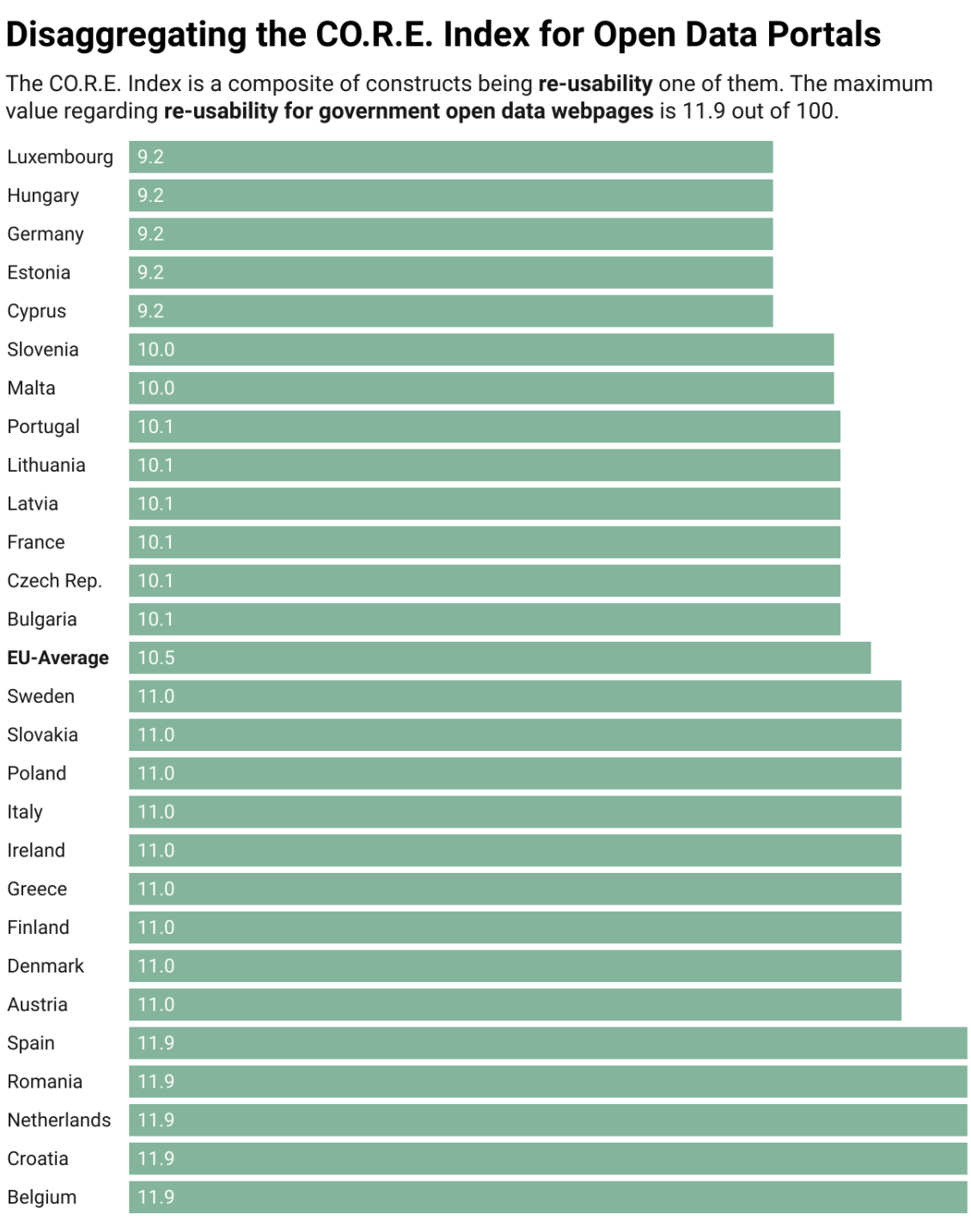
The same problem happens to Luxembourg, Malta and Slovenia. Since the EU-average is 5 for this construct, only Sweden appears below it without having a zero score. The other countries have shared and integrated their data sets using different government platforms to make available. Figure 7.7 introduces overall results for the rest of the countries scoring the maximum in this construct. The existence of hyperlinks connecting local, regional and national levels of public administration to different web portals also counts as a variable.

7.1.6 Government open data webpages: re-usability

The last construct is Re-usability and it is applied to government open data webpages primarily with the purpose of knowing whether the information on public contract is downloadable as well as easy to mine. In this case, the file extension is an asset for specific uses, for instance, statistics, data analytics and programming languages. This is why the link between data on public procurements and APIs, information on fees, rules involving free-usability, licences, conditions for re-usability and machine-readable data plays an important role. We have also checked two official projects of the European Union called Administrative Capacity and eInvoicing Verified functioning as follow-ups for public in the region with the cooperation with the EU Member States.[2] As Figure 7.8 illustrates, the EU-average for Re-usability regarding the 27 EU government open data webpages is 10.5. All countries scored significantly varying from 9.2 and 11.9 which is the maximum for this construct measuring web portals. That means the data ready to be re-used comply with the basic extensions like xlsx, csv or text and certification yet the catalogues or data sets on emergency public may not be easy to mine or download. Belgium, Croatia, the Netherlands, Romania and Spain have the highest score, because their cooperation with the initiative eInvoicing has been outstanding compared to the other countries. In a nutshell, they have accomplished the tasks they were designated for. In addition, most countries put representatives "in charge of eInvoicing matters at the national and sub-national levels" verifying and approving the work of the European Commission. Another distinguishable aspect for these countries was the presence of data easy to mine on both webpages government open data portal and data.europa.eu increasing the capacity of data re-usability.

[2] See the official websites for both initiatives of the European Union European Commission, Public procurement – a study on administrative capacity in the EU and eInvoicing Country Factsheets for each Member State & other countries.

Figure 7.8: Re-usability on government open data webpages



Data Quality and the SCO.R.E.

Public buyers are encouraged under the EU framework to interact with private market. They are also expected to stimulate the use of new technologies and incentivize civil society to reuse and analyse. The Guidance from the European Commission on using the framework in the emergency situation related to the COVID-19 crisis (2020/C 108 I/01) states that: "There are various ways to interact with the market to stimulate the supply and for the medium term needs, the application of urgent procedures could prove a more reliable means of getting better value for money and wider access to available supplies".

8.1 The SQuaRE Portal Model

Considering a myriad of contrasts between the SCO.R.E. and different indexes, the first obstacle to overcome is to show how far our model is semantically close to the definitions employed by the SQuaRE Portal Model. Nevertheless, it is of utmost importance to understand that in thesis **the SQuaRE Portal Model is a conceptual construct to be usually applied by third parties**. That means governments and private companies are responsible for the production of their data sets, including technical and intellectual bodies, and impartial researchers investigate on quality of the data sets as third parties. In our case, the SCO.R.E. data set is designed, conceptualized and assessed by the research project COrruption Risk indicators in Emergency (CO.R.E). The Table 8.1 introduces the standard ISO, its main categories, characteristics, as well as the syntactic and semantic values for assessment.

Specifically on accuracy this characteristic has two main aspects, i.e., syntactic accuracy and semantic accuracy. The former refers to the "closeness of the data values to a set of values defined in a domain considered syntactically correct" and the latter to "the closeness of the data values to a set of values defined in a domain considered semantically correct".

Table 8.1: Semantic definitions of the SQuaRE Portal Model

SQuaRE Portal Model			
Standard	Main Categories	Characteristics	Syntactic and Semantic Definition
ISO/IEC 25012	Inherent	Accuracy	The degree to which data has attributes that correctly represent the true value of the intended attribute of a concept or event in a specific context of use. **It has two main aspects:** **Syntactic Accuracy:** Syntactic accuracy is defined as the closeness of the data values to a set of values defined in a domain considered syntactically correct. **Semantic Accuracy:** Semantic accuracy is defined as the closeness of the data values to a set of values defined in a domain considered semantically correct.
ISO/IEC 25013	Inherent	Completeness	The degree to which subject data associated with an entity has values for all expected attributes and related entity instances in a specific context of use.
ISO/IEC 25014	Inherent	Consistency	The degree to which data has attributes that are free from contradiction and are coherent with other data in a specific context of use. It can be either or both among data regarding one entity and across similar data for comparable entities.
ISO/IEC 25015	Inherent	Credibility	The degree to which data has attributes that are regarded as true and believable by users in a specific context of use. Credibility includes the concept of authenticity (the truthfulness of origins, attributions, commitments).
ISO/IEC 25016	Inherent	Currentness	The degree to which data has attributes that are of the right age in a specific context of use.
ISO/IEC 25017	Inherent and System-Dependent	Accessibility	The degree to which data can be accessed in a specific context of use, particularly by people who need supporting technology or special configuration because of some disability.
ISO/IEC 25018	Inherent and System-Dependent	Compliance	The degree to which data has attributes that adhere to standards, conventions or regulations in force and similar rules relating to in a specific context of use.
ISO/IEC 25019	Inherent and System-Dependent	Confidentiality	The degree to which data has attributes that ensure that it is only accessible and interpretable by authorized users in a specific context of use. Confidentiality is an aspect of information security (together with availability, integrity) as defined in ISO/IEC 13335-1:2004.
ISO/IEC 25020	Inherent and System-Dependent	Efficiency	The degree to which data has attributes that can be processed and provide the expected levels of performance by using the appropriate amounts and types of resources in a specific context of use.
ISO/IEC 25021	Inherent and System-Dependent	Precision	The degree to which data has attributes that are exact or that provide discrimination in a specific context of use.
ISO/IEC 25022	Inherent and System-Dependent	Traceability	The degree to which data has attributes that provide an audit trail of access to the data and of any changes made to the data in a specific context of use.
ISO/IEC 25023	Inherent and System-Dependent	Understandability	The degree to which data has attributes that enable it to be read and interpreted by users, and are expressed in appropriate languages, symbols and units in a specific context of use. Some information about data understandability are provided by metadata.
ISO/IEC 25024	System-Dependent	Availability	The degree to which data has attributes that enable it to be retrieved by authorized users and/or applications in a specific context of use.
ISO/IEC 25025	System-Dependent	Portability	The degree to which data has attributes that enable it to be installed, replaced or moved from one system to another preserving the existing quality in a specific context of use.
ISO/IEC 25026	System-Dependent	Recoverability	The degree to which data has attributes that enable it to maintain and preserve a specified level of operations and quality, even in the event of failure, in a specific context of use.

According to the SQuaRE Portal Model, accuracy is based on a main category called **inherent**. It stands for "the degree to which quality characteristics of data have the intrinsic potential to satisfy stated and implied needs when data is used under specified conditions. From the inherent point of view, refers to data itself, in particular to: data domain values and possible restrictions (e.g. business rules governing the quality required for the characteristic in a given application); relationships of data values (e.g. consistency); metadata".[1] By syntactically correct, the SQuaRE Portal Model points to the sequence of strings, inputs or simply words. In our case, if this chain of words, for example, "public procurement" or "public contracts" are selected the same way for all the 27 EU countries and not "procurement

[1] See the definitions of the SQuaRE Portal Model clicking here.

under the public eye" or "contracts being adjudicated by the public administration" which may seem very close to 'procurement under the public eye" or "contracts being adjudicated by the public administration", but not the exactly the same. The other aspect is about the semantic accuracy and up to a certain extent linked to the syntactic accuracy. If the syntactic order of a phrase is changed, the semantics of the phrase will consequently be affected in meaning. The Tables 8.2 and 8.3 put side by side the constructs and variables of the SCO.R.E. with the main categories and characteristics of the SQuaRE Portal Model. For the characteristic "completeness" of the SQuaRE Portal Model, we find that the syntactic and semantic features are related to "The degree to which subject data associated with an entity has values for all expected attributes and related entity instances in a specific context of use". In this sense, our subject data associated with an entity is the"contract", the entity "the webpages for public procurement and government open data", and the values the ones seen in the column **variables** for completeness as Tables 8.2 and 8.3 show. To put it briefly, the construct **Availability/Accessibility leads to the information one can access when visiting the and the government open data webpages of the EU 27 member states.** If the territorial level can be identified, contract authority, contract object, contract amount and so on.

8.2 Testing statistically the SCO.R.E.

As Table 8.4 shows the SCO.R.E. are compared to six other indicators using similar or totally different scales covering interconnected topics with our data set such as corruption risk,, internet access, and the time of hours per year required to pay taxes. In order to test statistically the accuracy of our data on public procurement and government open data portals based on the definitions introduced by the SQuaRE Portal Model, we have attributed z-scores to every index used in our model. Apparently any approximation of the the Corruption Perceptions Index, Maturity and Budget Transparency would have no problem considering they have the same 0-100 scale as the SCO.R.E., however, the methodology from one index to another differs considerably. On the other hand, the indexes Fixed Broadband Subscribers and Individuals

Table 8.2: The SCO.R.E. and the SQuaRE Portal Model (I)

Constructs and variables CO.R.E.		SQuaRE Portal Model	
Construct	Variable	Main Categories	Characteristics
AA - Completeness	Territorial Level (info)	Inherent	Completeness
AA - Completeness	Authority ID	Inherent	Completeness
AA - Completeness	Contract Object	Inherent	Completeness
AA - Completeness	Contract Amount	Inherent	Completeness
AA - Completeness	Contract ID/CPV/Case File	Inherent	Completeness
AA - Completeness	Contract Duration	Inherent	Completeness
AA - Completeness	Contract Type	Inherent	Completeness
AA - Completeness	Contract Updates	Inherent	Completeness
AA - Completeness	How many tenders?	Inherent	Completeness
AA - Completeness	Procedure	Inherent	Completeness
AA - Completeness	Emergency Justification	Inherent	Completeness
AA - Completeness	Open Tender Notice	Inherent	Completeness
AA - Completeness	Tender Name	Inherent	Completeness
AA - Completeness	Tender ID	Inherent	Completeness
AA - Completeness	Other Documents (Gov)	Inherent	Completeness
AA - Completeness	Aggregated Info (Contract Copy)	Inherent	Completeness
AA - Easy Access	Public Web	System-Dependent	Availability
AA - Easy Access	Emergency Contract (Internal/External Web)	System-Dependent	Availability
AA - Easy Access	Emergency Contracts (Info)	System-Dependent	Availability
AA - Easy Access	Info about Web/e-procurement	System-Dependent	Availability
AA - Easy Access	Contact Channels	System-Dependent	Availability
AA - Easy Access	FOIA/Transparency Act	System-Dependent	Availability
AA - Easy Access	Hyperlinks/Icon Emergency	System-Dependent	Availability
AA - Easy Access	Search Engine for the Contracts	System-Dependent	Availability
AA - Easy Access	Information Structure	System-Dependent	Availability
AA - Easy Access	Site Map	System-Dependent	Availability
AA - Easy Access	Complaint Channel	System-Dependent	Availability
AA - Easy Access	Anonymous Disclosure	Inherent and System-Dependent	Compliance
AA - Easy Access	Whistleblowers Protection	Inherent and System-Dependent	Compliance
AA - Easy Access	Data Protection	Inherent and System-Dependent	Confidentiality
AA - Easy Access	Intellectual Property	System-Dependent	Availability
AA - Easy Access	Help	System-Dependent	Availability
AA - Understandability	Graphics	Inherent and System-Dependent	Understandability
AA - Understandability	Info based on Directive (UE) 2016/2102	Inherent and System-Dependent	Compliance
AA - Understandability	Information Levels	Inherent and System-Dependent	Understandability
AA - Understandability	Information Complexity	Inherent and System-Dependent	Understandability
AA - Understandability	FAQs	Inherent and System-Dependent	Understandability
A - Quality	Precise/Certified Data	Inherent and System-Dependent	Precision
A - Quality	Last Updates	Inherent and System-Dependent	Traceability
A - Quality	Update Frequency	Inherent and System-Dependent	Traceability

Table 8.3: The SCO.R.E. and the SQuaRE Portal Model (II)

Constructs and variables CO.R.E.		SQuaRE Portal Model	
Construct	Variable	Main Categories	Characteristics
A - Openness	Data Format	Inherent and System-Dependent	Efficiency
A - Openness	Standard	Inherent and System-Dependent	Compliance
Interoperability	Different Government Levels	Inherent and System-Dependent	Compliance
Interoperability	Interoperability Standards	Inherent and System-Dependent	Compliance
Interoperability	Hyperlinks to other Gov. Levels	Inherent and System-Dependent	Compliance
Re-usability	API	Inherent	Credibility
Re-usability	Metadata	Inherent and System-Dependent	Compliance
Re-usability	Information on Fees	Inherent and System-Dependent	Compliance
Re-usability	Free Re-use/Data Re-use Licence	Inherent and System-Dependent	Compliance
Re-usability	MachineReadable Data	Inherent and System-Dependent	Compliance
ODP-AA-Easy Access	Webpage	Inherent	Consistency
ODP-AA-Easy Access	data.europa.eu (EU)	Inherent	Consistency
ODP-AA-Easy Access	Contact Channels	Inherent and System-Dependent	Compliance
ODP-AA-Easy Access	FOIA/Transparency Act	Inherent and System-Dependent	Compliance
ODP-AA-Easy Access	Search Engine for the Data	Inherent and System-Dependent	Compliance
ODP-AA-Easy Access	Information Structure	Inherent and System-Dependent	Compliance
ODP-AA-Easy Access	Site Map	Inherent and System-Dependent	Compliance
ODP-AA-Easy Access	Data Protection	Inherent and System-Dependent	Confidentiality
ODP-AA-Easy Access	Intellectual Property	Inherent and System-Dependent	Compliance
ODP-AA-Easy Access	Help	Inherent and System-Dependent	Compliance
ODP-A-Quality	Last Updates	Inherent and System-Dependent	Compliance
ODP-A-Quality	Updates Frequency	Inherent and System-Dependent	Compliance
ODP-A-Openness	Data Format	Inherent and System-Dependent	Efficiency
ODP-A-Openness	Standard	Inherent and System-Dependent	Compliance
ODP-A-Openness	Data Efficiency	Inherent and System-Dependent	Efficiency
ODP-A-Openness	Data on Emergency Contracts	Inherent and System-Dependent	Compliance
ODP-A-Openness	Data at Different Administrative Levels (Regions/Municipalities)	Inherent and System-Dependent	Compliance
ODP-Interoperability	Sharing	Inherent	Completeness
ODP-Interoperability	Integrated	Inherent	Completeness
ODP-Interoperability	Different Government Levels	Inherent	Completeness
ODP-Interoperability	Interoperability Standards	Inherent and System-Dependent	Compliance
ODP-Interoperability	Hyperlinks to other Gov. Levels	Inherent and System-Dependent	Compliance
ODP-Re-usability	Downloadable and Easy to Mine	Inherent and System-Dependent	Compliance
ODP-Re-usability	eInvoicing Verified (EU)	Inherent and System-Dependent	Precision
ODP-Re-usability	Administrative Capacity (EU)	Inherent	Credibility
ODP-Re-usability	API	Inherent	Credibility
ODP-Re-usability	Information on Fees	Inherent and System-Dependent	Compliance
ODP-Re-usability	Free Re-use/Data Re-use Licence	Inherent and System-Dependent	Compliance
ODP-Re-usability	Re-use conditions	Inherent and System-Dependent	Compliance
ODP-Re-usability	Machine-Readable Data	Inherent and System-Dependent	Compliance

Using Internet have measures per hundred inhabitants while the Administrative Burden index hours per year. In this case, the most advisable path is to normalize all of them with z-scores and then be sure that they all have the same distribution of values.[2]

Table 8.4: Comparison of the SCO.R.E. with Indexes on Corruption and other Indicators

SCO.R.E.	Institutional Support	What is Measured	Scale
COrruption Risk indicators in Emergency (CO.R.E)	Universitat Oberta de Catalunya and co-funded by the European Union	Risk of corruption in emergency times in public	0-100
Compared Indexes	**Institutional Support**	**What is Measured**	**Scale**
Corruption Perceptions Index	Transparency International	Perception of corruption levels	0-100
Maturity	European Commission	Development of the European countries in the field of data	0-100
Budget Transparency	International Budget Partnership	How public funds are raised and spent	0-100
Fixed Broadband Subscribers	World Bank	Number of fixed broadband subscribers per 100 inhabitants	per hundred
Individuals Using Internet	World Bank	Number of individuals using internet per 100 inhabitants	per hundred
Administrative Burden	European Research Centre for Anti-Corruption and State-Building (ERCAS)	Time required to pay taxes (hours per year)	per hour

The most adequate workaround we could come up with to solve the numerical incompatibility of the other indexes with the SCO.R.E.'s was through the normalization of all indicators before building up our model. The result then is a z-score for every index including the SCO.R.E. covering all countries of the EU until 2021. Table 8.5 displays the z-scores for the SCO.R.E. as well as the other indexes after the normalization of all indicators to produce three statistical tests. One of them is a multiple linear regression to check the correlation between the SCO.R.E. and the other indexes as we can see in subchapter 8.2.1. A second statistical test is the analysis of the Pearson correlation coefficient as follows in subchapter 8.2.2 to examine how the model behaves after treating some outliers. Finally, the mean squared error to measure the quantity of error in our statistical model according to subchapter 8.2.3. Since our multiple linear regression has just one-year-data set corresponding the data collected for public procurement and government open data portals in 2022, the number of outliers may have affected the coefficients found, but not impeding a consistent analysis of the data regarding

[2] For model, we mean the SCO.R.E.'s z-scores and the z-scores of the other indicators as it is shown in Table 8.5.

its accuracy as we will clarify. In a nutshell, the outputs measuring the accuracy of our data set are satisfactory and our model proved to be statistically adequate.

Table 8.5: Z-scores for overall indexes and the SCO.R.E. model

Country	CO.R.E.	Corruption Perceptions Index	Maturity	Budget Transparency	Fixed Broad Band Subscribers	Individuals Using Internet	Administrative Burden
Austria	-0.510788855	0.713254353	0.742490184	-0.25456204	0.520507206	-0.494103411	-0.589780599
Belgium	0.765058197	0.643731366	-1.797741644	0.96547513	0.618212335	-0.437237289	-1.163031307
Bulgaria	0.833407146	-1.511481247	-0.218678616	-1.150153051	-1.880750388	3.16807481	-0.004949069
Croatia	-1.270221623	-1.163866309	0.19325087	-1.078386159	-0.724132911	0.358888411	0.562511227
Cyprus	-2.538474347	-0.746728384	0.67383527	0.955009125	0.701833842	-0.619208878	-1.516246389
Czech Rep.	0.484068072	-0.677205397	-0.493298273	-0.456406425	-0.207440019	0.631845794	0.950468777
Denmark	0.127134671	1.686576179	0.67383527	1.807240971	1.611107704	-0.482730186	1.147342757
Estonia	-0.222204403	0.713254353	0.879800013	-0.05869823	0.913968402	-1.415334578	-0.010739481
Finland	1.038453993	1.686576179	0.330560698	0.192485893	0.738803351	-0.960405606	1.726383876
France	-0.434845578	0.504685391	1.15441967	1.636794602	0.586524185	-0.403117616	0.377218069
Germany	-0.358902301	1.130392278	0.536525441	1.016310012	0.841789838	0.495367102	1.535300307
Greece	-0.510788855	-1.024820334	0.055941041	0.077359837	-0.984679922	0.211036495	-1.391529841
Hungary	-1.611966369	-1.441958259	-1.591776901	-0.442950133	-0.457424314	1.166387335	-0.39869703
Ireland	0.476473745	0.713254353	0.948454927	-0.402581256	0.184260724	-1.062764625	-0.595571011
Italy	0.901756095	-0.538159422	0.742490184	-0.900464071	-1.750476882	0.722831588	0.759385207
Latvia	0.552417021	-0.329590459	-0.28733353	-0.837668041	0.103279896	-0.061920888	-0.010739481
Lithuania	0.68911492	-0.190544484	0.536525441	-0.389124963	-0.585057141	-0.858046588	-1.938946406
Luxembourg	-2.173946618	1.199915266	-1.042537587	0.830912207	1.699130343	-1.358468456	-0.010739481
Malta	-0.639892425	-0.677205397	-2.072361301	1.114989489	-0.162548473	-0.403117616	-1.747862837
Netherlands	0.901756095	1.269438253	0.742490184	1.695105202	1.205323338	-0.630582102	0.067653779
Poland	0.833407146	-0.538159422	0.948454927	-1.701861036	-0.882573661	1.81466112	-0.39869703
Portugal	0.970105044	-0.121021497	-1.042537587	-0.115513686	-0.827119398	0.779697709	-0.39869703
Romania	0.408124795	-1.302912284	-0.355988444	-1.59122041	-1.959970763	-0.130160234	0.956259188
Slovakia	0.68911492	-0.816251372	-2.141016215	-1.054463861	-0.034915647	0.199663271	0.962049599
Slovenia	-0.214610075	-0.468636434	0.742490184	-0.451920994	-0.433658202	0.665965467	1.147342757
Spain	1.251095169	-0.190544484	0.948454927	-0.25456204	0.058388351	-0.300758598	0.568301638
Sweden	-0.434845578	1.478007216	0.19325087	0.84885393	1.107618208	-0.596462429	-0.583990188

8.2.1 Multiple linear regression

Usually the R-squared in a multiple linear regression is expected to be lower than 0.5 or 50% when the sample events are intimately linked to **human behaviour**. It is well-known that public procurement and government open data portals are substantially influenced by political and legal decision-making processes clearly derived also from human values in the public sector. In addition, governance best practices naturally take time to adjust resources and involve society participation in the fight against corruption. As Table 8.4 showed, we selected those indexes in which we could combine data on public procurement and government open data portals with the corruption risk factor. We achieve that goal including the Transparency International index in our multiple linear regression.

Table 8.6: Multiple linear regression: SCO.R.E. and indexes for the EU

call: lm(formula = CO.R.E. TI + ODM + BT + FixBbU + IUI + AB)

Residuals for all the 27 countries of the EU:

1	2	3	4	5	6	7	8	9	10
-0.64723076	0.77145236	0.07666998	-0.97192476	-0.55798344	0.73017699	0.24611796	0.12940357	-0.06660312	0.06838992
11	12	13	14	15	16	17	18	19	20
-0.68909313	-0.22548061	-0.84297137	0.06536566	-0.44474912	0.81899621	0.56544120	-1.65799407	0.10220989	1.17556784
21	22	23	24	25	26	27			
0.18541864	0.09306916	-0.50592687	0.97290667	-0.28424865	1.56945838	-0.67643851			

Coefficients:

	Estimate	**Std. Error**	**t value**	**Pr(>|t|)**
(Intercept)	1.299e-16	1.594e-01	0.000	1.00000
Transparency International (TI)	1.104e+00	3.315e-01	3.332	0.00332 **
Maturity (ODM)	-1.256e-01	1.786e-01	-0.703	0.49018
Budget Transparency (BT)	8.374e-02	1.861e-01	0.450	0.65749
Fixed Broadband Users (FIxBbU)	-2.026e-01	2.671e-01	-0.759	0.45692
Individuals Using Internet (IUI)	-9.792e-01	3.643e-01	-2.688	0.01414 *
Administrative Burden (AB)	1.024e-01	2.350e-01	0.436	0.66768

Mean: 1.027181e-17 **Standard Deviation:** 0.726234 **Signif. codes:** 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.828 on 20 degrees of freedom
Multiple R-squared: 0.4726, **Adjusted R-squared:** 0.3144
F-statistic: 2.987 on 6 and 20 DF, **p-value:** 0.02999

Table 8.7: Multiple linear regression: SCO.R.E. and indexes for the EU without Luxembourg, Netherlands and Spain

call: lm(formula = CO.R.E. TI + ODM + BT + FixBbU + IUI + AB)

Residuals for overall countries of the EU except Luxembourg, Netherlands and Spain:

1	2	3	4	5	6	7	8	9	10
-0.76243295	0.37945389	0.32210658	-0.87153194	-0.24800052	0.84000237	0.45370569	0.16474509	-0.17411485	0.62665552
11	12	13	14	15	16	17	18	19	20
-0.56396946	0.03670902	-1.09654946	0.08644317	-0.08856154	0.74627708	0.70020248	-0.10531781	0.30259070	-0.04618137
21	22	23	24						
-0.40256333	0.56977916	0.03802677	-0.90747428						

Coefficients:

	Estimate	**Std. Error**	**t value**	**Pr(>|t|)**
(Intercept)	6.618e-16	1.311e-01	0.000	1.000000
Transparency International (TI)	1.388e+00	2.615e-01	5.310	5.76e-05 ***
Maturity (ODM)	-3.956e-01	1.498e-01	-2.641	0.01714 *
Budget Transparency (BT)	2.604e-02	1.540e-01	0.169	0.86775
Fixed Broadband Users (FIxBbU)	-4.273e-01	2.121e-01	-2.014	0.06007
Individuals Using Internet (IUI)	-9.229e-01	2.800e-01	-3.296	0.00427 **
Administrative Burden (AB)	1.168e-01	1.861e-01	0.628	0.53852

Mean: -6.995815e-17 **Standard Deviation:** 0.5521707 **Signif. codes:** 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6423 on 17 degrees of freedom
Multiple R-squared: 0.6951, **Adjusted R-squared:** 0.5875
F-statistic: 6.46 on 6 and 17 DF, **p-value:** 0.001089

Afterwards, another index that could give us a benchmark in how initiatives and official webpages for more transparency in the public sector have been developed by governments inside the EU. It seems that the Open Data Maturity index fits well our purposes, because it focuses on policies and strategies, re-use, the enablement of users to access as well as the quality of the metadata produced (Data.europa.eu, 2021). Budget Transparency is an index led by the International Budget Partnership and concentrates in measuring how public funds are raised and spent. For that reason, we also decided to include it in our multiple linear regression. The three last indexes incorporated in our multiple linear regression refer to the World Bank data on the number of broadband subscribers and individuals accessing internet for each country of the EU; and the time of hours per year required to pay taxes or the administrative burden index produced by the European Research Centre for Anti-Corruption and State-Building (ERCAS). Table 8.6 introduces the results of our multiple linear regression with a *p-value* of 0.02999 or a value < 0.05. The multiple R-squared is 0.4726 or 47% accompanied by the adjusted R-squared of 0.3144 or 31%. Bearing in mind that this statistic reflects the percentage of the variance in the **dependent variable, which is in our case the SCO.R.E. with normalized values,** that the **independent variables or the other normalized indexes** explain collectively. Therefore, the R-squared of the test is measuring the strength of the relationship between the SCO.R.E. and the other indexes on a 0-100% scale. After removing Luxembourg, Netherlands and Spain as outliers, the R-squared increases to 0.6951 and the adjusted R-squared to 0.5875. The *p-value* drops to 0.001089 which is a very significant result to prove the linearity of the model and to attest in part the accuracy of the data collected. When we look at Tables 8.6 and 8.7, the level of significance for the Transparency International indicator based on perception increases considerably in comparison with the World Bank's indicator on the number of individuals using internet. This output reveals that the exclusion of the countries strengthens more the hypothesis of perception than the predictors relying on evidence. The same happens to the coefficient for the Open Data Maturity index that starts

[3] We recollect that the presence of human factors in indexes measuring corruption can diminish the correlations between the SCO.R.E. model and open data. The Open Data Maturity index, for instance, includes in its methodology the category *strategic awareness* focusing on four areas: "Beyond this first layer of 'strategic awareness', the impact dimension focusses

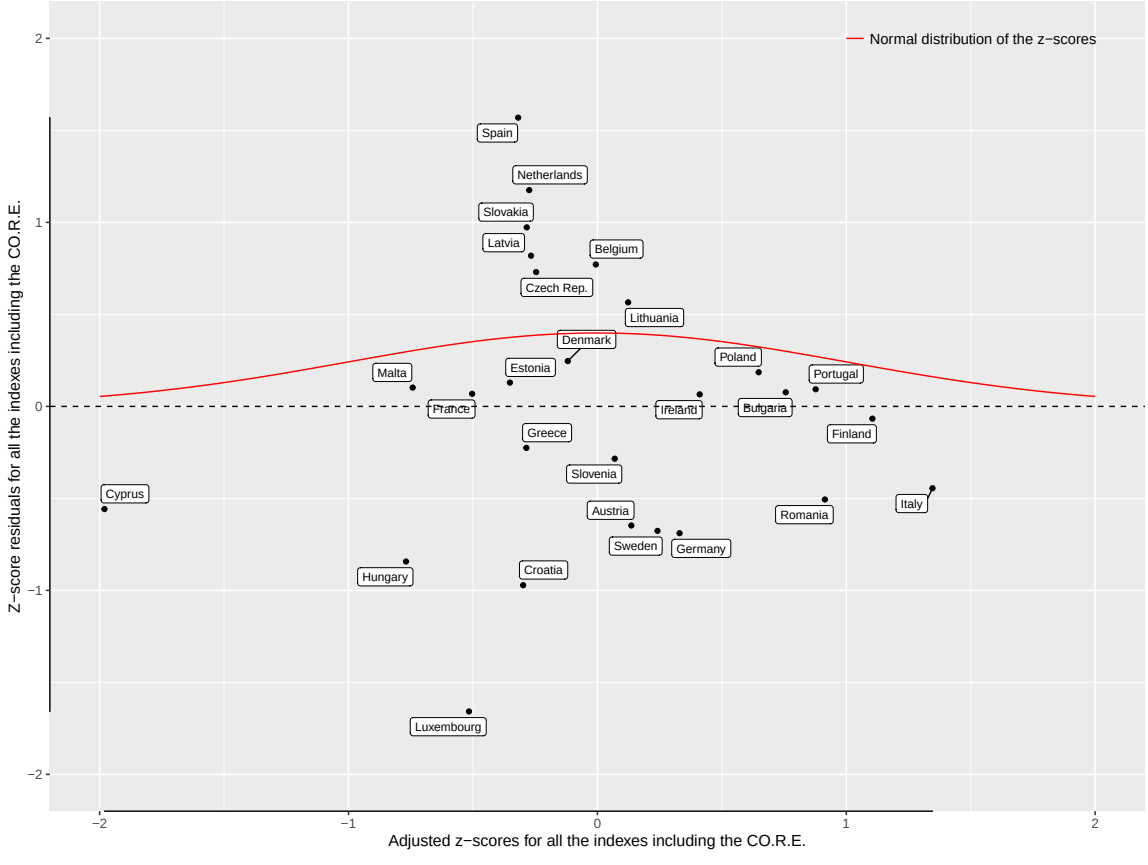
becoming significant with the exclusion of the outliers.[3] It should be recalled that the SCO.R.E. are related to digital contracting platforms between public tenders and bidders. It aggregates knowledge about the risk of corruption in emergency times as well as it measures the availability, interoperability and re-usability of the information on public procurement and government open data portals. It also helps us assess how far the functions and features of the web portals constituting the SCO.R.E. can prevent and fight corruption in emergency times. Moreover, it will support the documentation of good practices about public procurement and government open data. It is indispensable to stress that the R-squared linked to these indicators herein is not used to determine whether our coefficient estimates and predictions are inadequate. For that, we have to check in what fashion the residuals of the model behave and, eventually, the distribution of them.

8.2.1.1 Residuals for the SCO.R.E. model

Figure 8.1 shows the two kinds of distribution concerning the residuals for the SCO.R.E. model. One of them is the dispersion of the points on the two sides of the adjusted line 0, and the other normal distribution around the mean 1.027181e-17 with a standard deviation of 0.72. The more distant the points, the more the dispersion of data. Therefore, observing the residuals we also notice Luxembourg, Netherlands and Spain are outliers occupying different positions in our index in relation to the other indexes. However, this discrepancy reflects only the way the model we suggest captures the characteristics of the public procurement and government open data webpages. In other words, the more information we could mine from digital platforms on public procurement and government open data through functions and features, the higher the SCO.R.E. outputs. This particularity is not present in any of the other indicators.

on four areas of sectoral impact: political, social, environmental, and economic. Within these areas, the questionnaire examines the extent to which monitoring is in place to document the re-use of open data published in these fields, the extent to which applications, products, and services have been developed to address challenges in these fields, as well as the extent to which civil society initiatives exist that are based on such open data and supported by government institutions" (Data.europa.eu, 2021, p. 9).

Figure 8.1: Z-score residual distribution of indexes for the EU



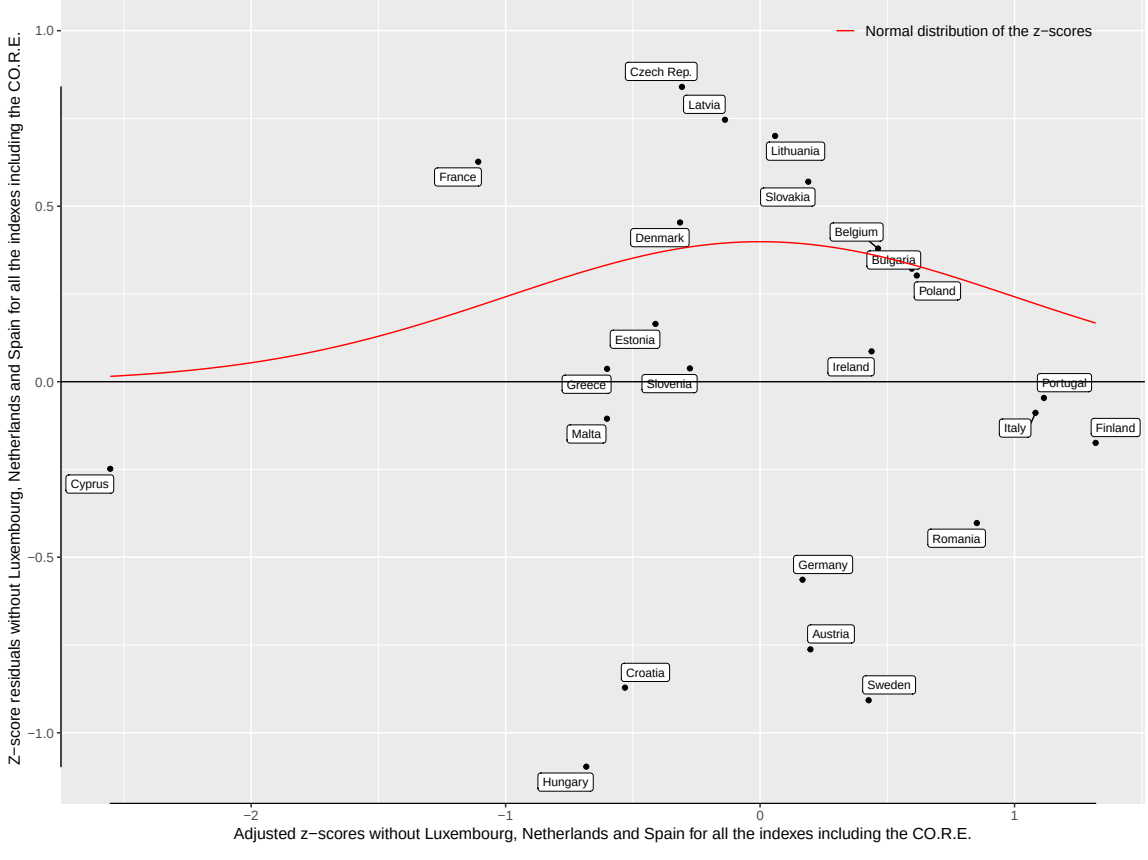
According to the open data Maturity Report 2021, a study carefully elaborated by the data.europa.eu as an initiative of the European Commission, France, Ireland and Spain have been ranked, respectively, in the first, second and third positions (Data.europa.eu, 2021, p. 5). At intermediate levels, we find Sweden, Croatia, Greece, Bulgaria and Latvia positioned around the average for the 27 countries of the EU. Luxembourg and Belgium are placed below the average, but former a critical case in terms of transparency than the latter. In contrast with the Maturity's methodology, which assesses "portal functions and features that enable users to access open data via the national portal and support interaction within the open data community", the SCO.R.E. go further including and weighing the portal functions and features for public procurement and government open data webpages. It refers to the four areas of the Open Data Maturity Index when quantitative data analysis is combined with the dimensions Open Data Impact and Open Data Policy. The other dimensions Open Data Portal and Open

Data Quality are relatively closer to the SCO.R.E. since they review portal features, usage, data provision, portal sustainability, data currency, deployment quality and linked data among other more quantifiable elements.

8.2.1.2 Residuals for the SCO.R.E. Model and Outliers

After excluding Luxembourg, Netherlands and Spain from our model, the remaining of z-scores seems to be a more adequate fit for a normal distribution. As Figure 8.2 also depicts, remodeling the indexes with fewer countries led to a smaller mean and a more significant standard deviation, respectively, -6.995815e-17 and 0.55.

Figure 8.2: Z-score residual distribution of indexes for the EU except Luxembourg, Netherlands and Spain



However, the exclusion of the outliers inevitably weighs against the SCO.R.E. making our model closer to the perception of corruption as suggests the

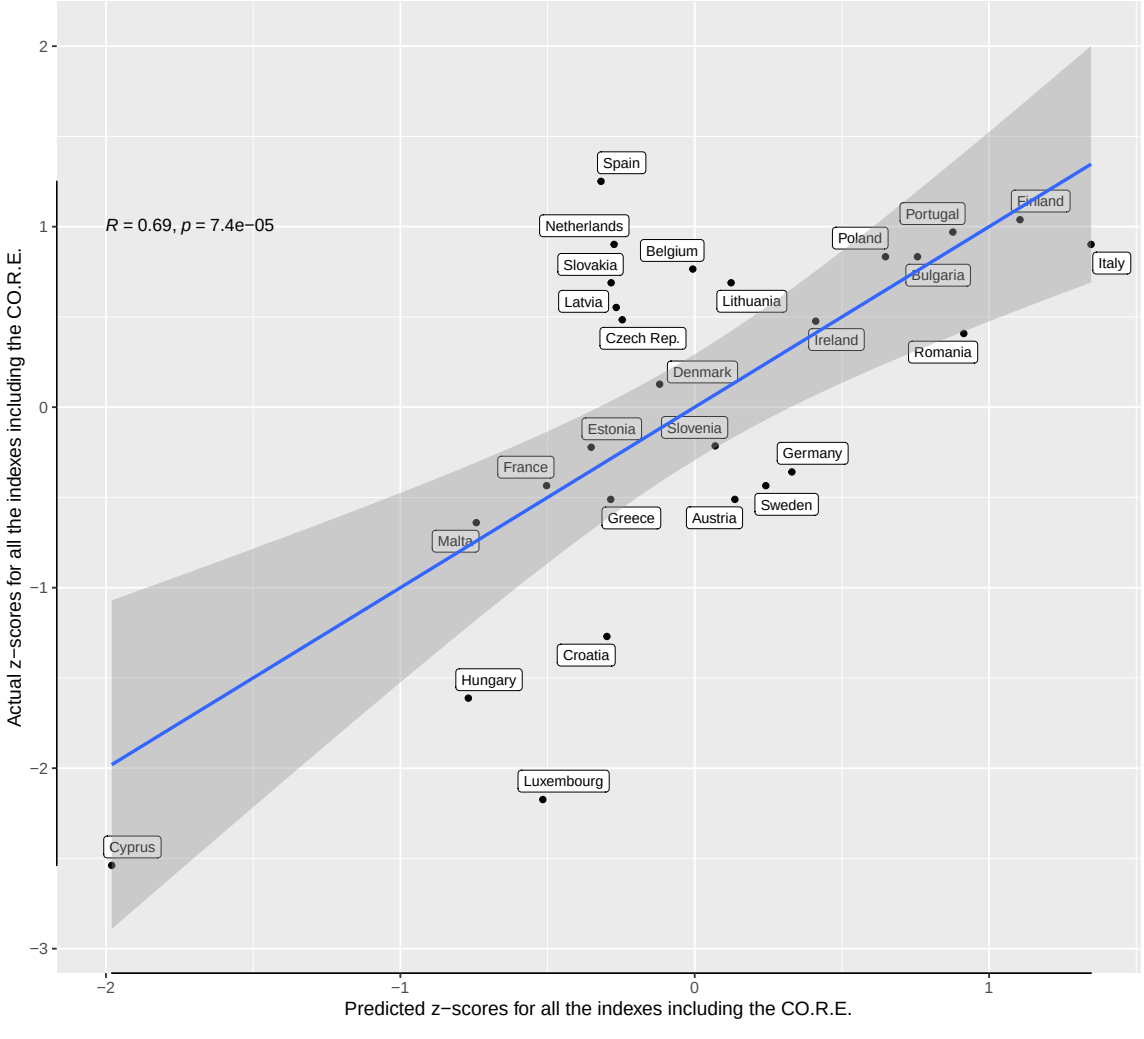
Transparency International than accomplishing results based on evidence extracted from the public procurement and government open data webpages. Another critical factor with the removal of the Luxembourg, Netherlands and Spain is that the predictors have become less accurate from the first to the second multiple linear regression. Once we are measuring the correlation between the z-scores for the SCO.R.E. and for the indicators, the second multiple linear regressions attests more the linearity of the SCO.R.E. than the first. As we could observe in Tables 8.6 and 8.7, the standard deviation dropped making the distance between the actual and the predicted z-scores smaller. In addition, the coefficients for Transparency International mapping the perception of corruption levels and the one produced by the the World Bank quantifying the individuals using internet became more significant while a new more significant coefficient was introduced. Open Data Maturity is the only indicator in our regression with both characteristics, that is to say, quantitative data based on evidence and qualitative data stemming from perception.[4]

8.2.2 Pearson correlation coefficient

The Pearson correlation between the actual and predicted z-scores for the SCO.R.E. is considerably significant for all the 27 EU countries. As Figure 8.3 displays, the result was a correlation of 0.69 and the *p-value* 7.4e-05. We used the actual z-scores attributed to the SCO.R.E. aforementioned in Table 8.5 meaning the data on public procurement and government open data webpages have a significant correlation, but yet to be checked without some outliers. After removing them, the coefficient behaves as the multiple R-squared outputs in our multiple linear regressions in Tables 8.6 and 8.7. Moreover, the exclusion of the outliers also makes the relationship between the z-scores for the CO.R.E. and the other z-scores stronger. Since Luxembourg, Netherlands and Spain were more distant from the average in our model as displayed by Figure 8.4, they were removed so we could test how far they influenced correlations in which perception is more present than evidence. As expected, the Pearson correlation is very significant or 0.83 having a *p-value* of 4.2e-07.

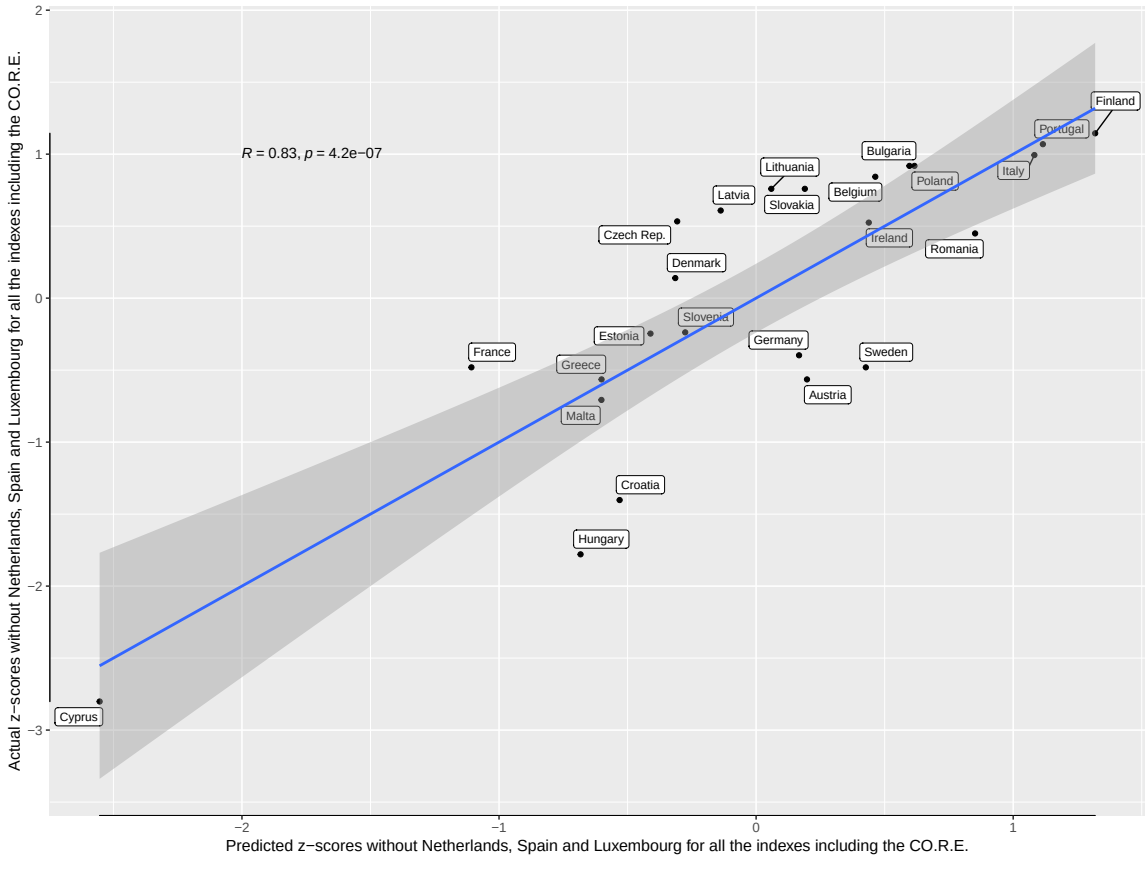
[4] See footnote 3, section 8.2.1.

Figure 8.3: Z-score correlation of actual and predicted values for the EU



As we have already seen, the only test able to explain the influence of the indexes on the SCO.R.E. is the multiple linear regression. However, the Pearson correlation still proves the linearity of our model and, knowing the SCO.R.E. are the variable we want to explain or the dependent variable, we may say that the outliers removal in fact approximates the SCO.R.E. to the methodological field in which perception counts.

Figure 8.4: Z-score correlation of actual and predicted values for the EU except Luxembourg, Netherlands and Spain



8.2.3 Mean squared error

The mean squared error of a model is usually indicated to test statistically the accuracy and reliability of a data set. The level of accuracy is related to the events involving errors that may occur during the production of the estimates. In that case, accuracy can be calculated by the Mean Squared Error (MSE) showing variability and eventually possible bias for the sample (Brancato, Boggia, Barbalace, & et al., 2016, p. 42).[5] A mean squared error equals to zero when the model does not show any error. It is important to highlight that in case the value of the model increases, the model error will have the same pattern, that is to say, it will increase as well. The MSE is obtained when from each actual value the predicted value is subtracted. Table 8.8 introduces the values with and without the outliers of our model.

[5] Mean squared error is strongly recommended, for instance, by the Italian Institute of statistics.

Table 8.8: Predicted and actual values for overall z-scores of the EU countries

	All Countries of the EU		All Countries of the EU except Luxembourg, Netherlands and Spain	
Country	Predicted Values	Actual Values	Predicted Values	Actual Values
Austria	0.13644190	-0.5107889	0.1979219	-0.5645110
Belgium	-0.00639416	0.7650582	0.4636470	0.8431009
Bulgaria	0.75673716	0.8334071	0.5964021	0.9185087
Croatia	-0.29829687	-1.2702216	-0.5308433	-1.4023753
Cyprus	-1.98049090	-2.5384743	-2.5536081	-2.8016086
Czech Rep.	-0.24610891	0.4840681	-0.3069112	0.5330911
Denmark	-0.11898329	0.1271347	-0.3144108	0.1392949
Estonia	-0.35160798	-0.2222044	-0.4108677	-0.2461226
Finland	1.10505712	1.0384540	1.3188469	1.1447320
France	-0.50323549	-0.4348456	-1.1073801	-0.4807246
Germany	0.33019083	-0.3589023	0.1670313	-0.3969382
Greece	-0.28530824	-0.5107889	-0.6012201	-0.5645110
Hungary	-0.76899500	-1.6119664	-0.6828647	-1.7794142
Ireland	0.41110809	0.4764737	0.4382693	0.5247125
Italy	1.34650522	0.9017561	1.0824780	0.9939165
Latvia	-0.26657919	0.5524170	-0.1377782	0.6084989
Lithuania	0.12367372	0.6891149	0.0591120	0.7593145
Luxembourg	-0.51595255	-2.1739466	OUTLIER REMOVED	OULIER REMOVED
Malta	-0.74210231	-0.6398924	-0.6016302	-0.7069480
Netherlands	-0.27381175	0.9017561	OUTLIER REMOVED	OULIER REMOVED
Poland	0.64798851	0.8334071	0.6159180	0.9185087
Portugal	0.87703589	0.9701050	1.1155056	1.0693243
Romania	0.91405167	0.4081248	0.8518680	0.4493047
Slovakia	-0.28379175	0.6891149	0.1895353	0.7593145
Slovenia	0.06963857	-0.2146101	-0.2757707	-0.2377440
Spain	-0.31836321	1.2510952	OUTLIER REMOVED	OULIER REMOVED
Sweden	0.24159293	-0.4348456	0.4267497	-0.4807246

The difference between each actual and predicted value is elevated to the power of two or simply the difference squared. This mathematical process is repeated for overall values and then the sum of all of those squared values divided by the number of observations. Considering y the observed value, $\hat{y}$ the predicted value and n the number of events, the formula for the mean standard error is as follows:

$$MSE = \frac{\sum(y_i - \hat{y})^2}{n}$$

The first mean standard error, i.e., without removing Luxembourg, Netherlands and Spain from our model, is 0.7126583. As expected, with the exclusion of these three countries, the mean standard error drops significantly to 0.5405447. Once more, with the exclusion of the outliers, the level of

accuracy increases. Nevertheless, we highlight that the most elevated accuracy in that case only reveals that the SCO.R.E. model has become closer to the aspect of perception captured by the other indicators. As we have pointed out before, the Open Data Maturity index has two strictly dimensions assessing evidence and two others more linked to perception. The two World Bank indicators influence numerically the SCO.R.E. model, but they do not distinguish broadband subscribers and individuals using internet specifically for the accesses of public procurement and the government open data portals. Budget Transparency of the International Budget Partnership and Administrative Burden of the European Research Centre for Anti-Corruption and State-Building (ERCAS) include qualitative questions in their methodologies as well.

8.3 Tying up loose ends

Our first objective with the present chapter was primarily the approximation of the SCO.R.E. constructs and variables to the main categories and characteristics of the SQuaRE Portal Model. Then we tested our data paying attention to the outliers to measure the accuracy of our data following linear models when compared to the other indexes proving the correlations respond to mathematical operations varying between evidence and perception. The multiple linear correlations confirmed that the SCO.R.E. data set can be explained by other indexes since the outliers are treated, i.e., the exclusion of Luxembourg, Netherlands and Spain, implying more significant values for R-squared and adjusted R-squared accompanied by meaningful *p-values*. The Pearson correlations show in every scenario the linearity of our model investigating whether there is a positive attraction of the indexes selected with the SCO.R.E. model. The mean squared error corroborates the accuracy of the SCO.R.E. data when the outliers are removed from the model yet the interpretation of such result is more convenient for those predictors relying on perception.

Conclusion

After analyzing the public procurement and government open data webpages, we understand that the lack of transparency in public procurement inside the European Union is much more a challenge of a governance plan than the implementation of technologies in itself for most of its members. Functions and features already available on public procurement and government open data webpages are underused, not integrated and the catalogues of data representing less than they could in terms of territorial coverage. If compared to other indicators, like Corruption Perceptions Index and ERCAS, for instance, the SCO.R.E. are far from the outputs that we could agree upon considering the level of transparency of certain countries like Italy, Poland, Portugal and Spain. Nevertheless, as seen in our multiple linear regression, our index has shown significant correlations with the way the data on perception from other indexes behaves. This is interpreted by us as an alert since countries like Austria, Germany and Sweden could make available more functions and features on public procurement official websites. Another important issue is that public procurement under emergency times. In this case, the use of digital tools is quintessential to prevent and fight against corruption. Only few public procurement and open data government webpages have shown functions and features particularly designed to promote more transparency in extraordinary procedures. According to the European Central Bank, the European Union's GDP (share of world GDP in PPP) represents 11.9%. When we look at the value added by economic activity in the EU, agriculture corresponds 1.7%, industry including constructions 25%, and services considering also non-market services 73.3% (European Central Bank,

2022). In case of emergency times, the majority of tenders will be necessarily stressed by the demand of goods and services, however, are public authorities coordinated at a European level? Are functions and features on public procurement and government open data webpages relevant as a technological asset? In 2020, the European Union launched a package for the recovery of the region: "In 2020, the European Union provided an unprecedented response to the coronavirus crisis that hit Europe and the world. At its heart is a stimulus package worth EUR 2.018 trillion in current prices (EUR 1.8 trillion in 2018 prices). It consists of the EU's long-term budget for 2021 to 2027 of EUR 1.211 trillion (EUR 1.074 trillion in 2018 prices), topped up by EUR 806.9 billion (EUR 750 billion in 2018 prices) through NextGenerationEU, a temporary instrument to power the recovery" (European Commission, 2021). The recovery plan leads to what is called the resilience facility of the region. The budget is EUR 723.8 billion to be allocated in different sectors involving clean technologies and renewables, energy efficiency of buildings, and sustainable transport and charging stations. In addition, the investments in data cloud and sustainable processors, roll-out of rapid broadband services, digitalisation of public administration, and education and training to support digital skills (European Commission, 2021, p. 8-9).

As recommendations, we indicate some strategic measures to be adopted and might elevate the level of transparency in the European Union regarding public procurement. In addition, it is important to lay emphasis on the production and visualization of data about public using the functions and features already available on public procurement as well as government open data webpages. So, the crucial points to be pursued in the following years are:

- Coordination of good practices in public administrations among the EU countries to standardize the way data on public procurement is uploaded at a local level (availability);

- Coordination of good practices in public administrations among the EU countries to potentialize the proper use the Common Procurement Vocabulary (CPV) especially to cover all the territorials levels based on the Nomenclature of Territorial Units (NUTS) for statistics (availability);

- Training and workshops for public servers to mitigate the lack of data at a local level especially empowering web-

pages with more functions and features to include more information on public contracts, but also exploring the digital tools already existent (availability);

- Creating economic incentives from the EU through national public policies to finance and overcome the digital gaps related to ordinary and extraordinary procedures during pandemics and emergency times (availability);

- Increasing the integration of information and public procurement data on those webpages showing high scores in perception indexes like Transparency International, ERCAS and European Quality of Government Index (interoperability), but ranking low in SCO.R.E.;

- Integrating and sharing pieces of information and public procurement data at a local, regional and national level (interoperability);

- Integrating and sharing pieces of information and public procurement data from the previous topic with European portals like data.europa.eu (interoperability);

- Relying on the right of the access to information, all EU governments should create or expand mechanisms to incentivize the re-use of information on public contracts by civil society initiatives (re-usability).

The access to more data on public procurement can result in more democratic societies in which fundamental rights become more effective. Competition also increases and citizenship wins. In addition, with more integrity in public procurement through the availability, interoperability and re-usability of data, market distortions and oligopolies are reduced in size and influence in public administration. More available data and digital procedures for public procurement are also assets for sustainable economic development. Small companies have the opportunity, for instance, to dispute a tender at a local level offering low carbon footprints in return to society. In this regard, it is indispensable to prepare public administrations and economic operators to constantly take part of the digital administration based on the principle of the good administration.

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