ANNEXES

ANNEX A – FULL DESCRIPTION OF THE MEASUREMENT MODEL

Our approach builds on prior work with similar datasets making use of a range of public procurement 'red flags'[1]. The measurement model directly approximates our corruption definition according to which corruption works when legally prescribed principles of open and fair competition are circumvented by public officials during the implementation of procurement rules in order to recurrently award government contracts to companies belonging to the particularistic network. By implication, it is possible to identify the output and input sides of the corruption process: lack of bidders for government contracts (output) and means of fixing the procedural rules for limiting competition (inputs).[2] By measuring the degree of unjustified restriction of competition in public procurement, proxy indicators of corruption can be obtained.[3] The identified corruption indicators, however, only signal risk of corruption rather than actual corruption. They are expected to be correlated with corrupt exchanges rather than perfectly matching them.

[1] Charron et al 2017; Fazekas, Cingolani, and Tóth 2016; Klasnja 2016.

[2] These inputs of the corrupt tendering process represent process design choices of public buyers as their decisions are indispensable for corruption to occur. Of course, companies must be complicit too, even though they cannot by law design procurement tenders.

[3] Corruption can also be achieved in the post award phase which necessitates contract modification (e.g. increasing contract value) which is a more costly form of corruption as there are stringent rules on contract renegotiations all across Europe. This is to say that some forms of corruption are naturally not captured by our indicators, still the expectation is that the biggest part is captured.

Such proxy indicators signal corruption risks only if competition is to be expected in the absence of corruption on the markets in question. This implies that markets which are non-competitive under non-corrupt circumstances have to be excluded such as markets for specialised services. In order to identify markets which are non-competitive by nature, we relied on market size as measured by number of contracts awarded. Markets with less than 10 contracts awarded in 2009-2014[4] were considered as likely not able to sustain multiple competing firms even under non-corrupt circumstances. Markets were defined by a matrix of product groups (CPV[5] categories at level 3) and geographical location of contract performance (NUTS[6] regions at level 2). This condition excluded 8% of all awarded contracts, underlining that the vast majority of government purchases concern widely supplied goods and services.

[4] In the absence of company identifiers in the EU-wide public procurement dataset to actually calculate the number of different competing firms, we derived the contract number cut-off point by analysing the United Kingdom subsample where we manually assigned company IDs by matching names and addresses to official registry records. Cross tabulating number of contracts awarded on the market and the number of different companies supplying the UK government shows that the number of markets with less than 2 companies drops below 5% among markets with at least 11 contracts awarded, with the average number of companies steadily increasing as the number of contracts increase. Hence taking 10 contracts per market is a conservative cut-point for identifying competitive markets with multiple potential suppliers.

[5] CPV=Common Procurement Vocabulary. For more info see: http://simap.europa.eu/codes-and-nomenclatures/codes-cpv/codes-cpv_en.htm

[6] NUTS=Nomenclature of territorial units for statistics. For more info see: http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction

The simplest indication of restricted competition in line with our theoretical definition is when only one bid is submitted[7] in a tender on an otherwise competitive market. This typically allows the awarding of contracts above market prices and extracting corrupt rents (output side). In addition, recurrent single bidder tenders between a buyer and a supplier allow for developing interpersonal trust underpinning corrupt contracting. This is to say that while individual instances of single bidding may be explained by a number of non-corrupt reasons, recurrent or extensively used single bidder contracts in a public organisation or region are more likely to signal corruption and restricted access. Hence, the incidence of single bidder contracts awarded (i.e. contracts awarded in procurement tenders where only one bid was received by the contracting authority) is the most basic corruption proxy we propose.

The more complex indication of high-level corruption also incorporates characteristics of the tendering process that are in the hands of public officials who conduct the tender and contribute to competition restriction (input side). This composite indicator, which we call the Corruption Risk Index (CRI), is defined as follows:

$$CRI^i = \Sigma_j w_j * CI_j{}^i \quad (1)$$

$$\Sigma_j w_j = 1 \quad (2)$$

[7] According to correspondence with DG GROWTH officials, TED may contain the number of valid bids, that is after inadequate bids are rejected, rather than the number of submitted bids in some cases as the official guidance documents are not clear enough. Using the number of submitted bids rather than valid bids leads to an underestimation of corruption risks as excluding all but one bid on administrative grounds such as a missing stamp from one of the certificates, represents a corruption technique on its own (Fazekas, Tóth, King., 2016).

$$0 \leq CRI^i \leq 1 \quad (3)$$

$$0 \leq CI_j{}^i \leq 1 \quad (4)$$

where CRI^i stands for the corruption risk index of contract *i*, $CI_j{}^i$ represents the *j*th elementary corruption indicator observed in the tender of contract *i*, and w_j represents the weight of elementary corruption indicator *j*. Elementary corruption indicators or 'red flags' can be either corruption inputs or outputs. CRI = 0 indicates minimum corruption risk while CRI=1 denotes maximum corruption risk observed.

Based on qualitative interviews with participants of public procurement tenders, a media review and a review of the academic and policy literature, we identified a long list of potential 'red flags' of corruption and the associated corruption techniques. Qualitative interviews were carried out with public procurement practitioners 'close' to corrupt transactions to identify widely used corruption techniques, to explore the underlying rationale for each of them, and to gather specific examples (without concrete names). We conducted 54 semi-structured interviews each lasting for about 1-1.5 hours in 5 countries: Germany, Italy, Hungary, Sweden, and the UK. Interviewees covered all three major actor categories in public procurement (issuers, bidders, and advisors). They work in construction, healthcare, and IT services sectors taking part in projects ranging from large infrastructure projects of millions of EUR to small services contracts of few thousand EUR.

The media review entailed content analysis of articles appearing in 9 major online newspapers in Hungary between 2008 and 2015. Relevant articles were identified by standard keyword search in the online portals' archives using a range of words relating to corruption and public procurement. The so-identified sample then was manually checked to select those cases which contain concrete enough information

to identify corruption techniques or 'red flags'. Eventually, 47 relevant articles were used for detailed corruption technique mapping.

The review of the literature encompassed widely cited academic papers reviewing corruption measurement and research papers using public procurement corruption proxies similar to ours; while we also reviewed the policy literature on corruption prevention, corruption identification and in general good practice guides[8].

Full list of corruption red flags identified based on these diverse sources can be found in Fazekas, Cingolani, and Tóth (2016). These indicators range from tender announcement through contract award to contract implementation. Many of which cannot currently be reliably calculated on the EU-wide TED dataset, while further data collection work will be able to generate the detailed data needed for some additional indicators.

'Red flags' had to be reliably differentiated from 'green flags'[9] using statistical techniques to avoid the usual trap of 'red flag' approaches which are driven by a small number of known examples disregarding the diversity of public procurement markets. We implemented binary logistic regression models in order to directly model the input-output relationships between corruption 'red flags' and statistically differentiate between reliable 'red flags' and 'green flags'. Binary logistic regression

[8] Chong, Klien, and Saussier 2015; Klasnja 2016; OECD 2007; Pricewaterhouse Coopers 2013; Sequeira 2012; Transparency International 2006; World Bank 2009.

[9] Green flags are considered those characteristics or combination of characteristics of the tendering process which are widely associated with good practices of open and fair competition such as leaving a sufficiently long time period for bidders to prepare their bids or defining tender specifications in producer neutral, generic terms which allow for technologically different but functionally equivalent products to compete.

is preferable over standard techniques used for measuring latent variables such as PCA or SEM because, it allows for isolating the effect of interchangeable corruption techniques rather than assuming they are all correlated, it also provides an efficient framework for dealing with non-linearities, moreover it also allows for using control variables which are not meant to be 'red flags' still influence single bidding probability. Regression analysis is predominantly meant to capture systematic associations between inputs and outputs of the corrupt contracting process reflecting the corrupt groups' control, while they may also reflect some causal relationships.

The following model was estimated:

$$\Pr(\text{single bidder}_i = 1) = \frac{1}{1+e^{-Z_i}} \quad (5)$$

$$Z_i = \beta_0 + \beta_{1j} R_{ij} + \beta_{4m} C_{im} + \varepsilon_i \quad (6)$$

where *single bidder*$_i$ equals 1 if the *i*th contract awarded had only one bidder and 0 if it has more; Z_i represents the logit of a contract being a single bidder contract; β_0 is the constant of the regression; R_{ij} is the matrix of *j* corruption 'red flags' for the *i*th contract such as length of advertisement period; C_{im} stands for the matrix of *m* control variables for the *i*th contract such as the number of competitors on the market; ε_i is the error term; and β_{1j}, and β_{4m} represent the vectors of coefficients for explanatory and control variables.

Each regression includes the full list of control variables except for one (model 6 in Table 2). Control variables account for the most important alternative explanations to our conceptualised corrupt outcome such as low administrative capacity and product market idiosyncrasies, in particular: (1) institutional endowments measured by type (e.g. municipal, national) and sector (e.g. education, healthcare) of contracting body,

(2) differences in technology and market standards proxied by type of product procured using 40 different CPV divisions (e.g. financial services, construction works), (3) differences due to contract size and complexity indicated by contract value (logarithm, EUR), and (4) institutional framework as proxied by country and year of contract award. Once again, we run our regressions only on competitive markets. Descriptive statistics for these variables can be found in Annex C.

A logically equivalent, but practically different approach was used for identifying ‘red flags’ in categorical and continuous variables using the above regression model in each of the 28 countries analysed. For categorical variables, those categories were denoted as ‘red flags’ which turned out to be significant and substantial predictors of single bidding compared to the available most transparent and competitive category (e.g. open procedure in the case of procedure types contracting bodies can use when procuring). ‘Red flags’ in continuous variables were identified in an iterative process: first, a model was fitted using the linear continuous predictor; second, two discrete jumps in residual values were identified using residual distribution graphs. These discrete jumps or thresholds represent the points beyond which the probability of single bidding drastically changes. We looked for two thresholds for each continuous variable because both extremes of the distributions could represent high risk such as in the case of decision periods where snap decisions as well as unusually lengthy decisions could signal corruption albeit for slightly different reasons. While the exact threshold values may contain a certain degree of professional judgement, the fact that they enter into the regression models as significant and substantial predictors provides substantial evidence for their validity. In order to preserve the full population of observations, we always included a missing category in every corruption input. In some cases, missing values predicted single

bidding suggesting that concealing relevant tender information from bidders or the wider public served as a corruption technique, hence deserved to be included as 'red flag'. Risky categories and thresholds also differ by country reflecting the diverse market norms for contracting entities and bidding firms (e.g. high risk short advertisement period in Greece was up to 44 days, while only up to 27 days in the UK). Such diversity of 'red flag' definitions is supposed to capture the underlying corruption technique within each context by abstracting from different environmental conditions and norms.[10] The full definition of country-specific 'red flags' can be found in Appendix D.

After testing each red flag available in the EU-wide dataset and validated by prior research[11], we derived the following comparatively valid reliably computable components of CRI in addition to single bidding (overview in Table 1, descriptive statistics and exact definitions in Annex B and D):

1. A simple way to fix tenders is to avoid the publication of the call for tenders in the official public procurement journal (Tenders Electronic Daily (TED)) as this would make it harder for non-connected competitors to get informed about the opportunity and hence to prepare their bids. This is only relevant in non-open procedures where publication is up for decision as in open procedures publication is mandatory.
2. While open competition is relatively hard to avoid in some tendering procedure types such as open tender, others such as invitation tenders or

[10] As predicting the incidence of single bidding defined 'red flags', higher as well as lower frequency of risky categories per country resulted avoiding the problem of selecting only the outliers in the distributions more or less representing the same proportion of contracts in each country.

[11] Charron et al., 2017.

direct contracting are by default less competitive because they allow for picking directly who can submit bids. By implication, using less open and transparent procedure types can indicate the deliberate limitation of competition and favouring a connected bidder, that is corruption risks.

3. If the advertisement period, i.e. the number of days between publishing a tender and the submission deadline, is too short for preparing an adequate bid, it can serve corrupt purposes whereby the contracting body informally tells the favoured company about the opportunity ahead of time allowing it to properly prepare its bid. Alternatively, when the advertisement period becomes lengthy, it may also signal corruption risks because often legal challenge against the call for tenders specification or the chosen procedure type lies behind (e.g. an excluded company challenging the exclusion criteria set out in the call for tenders, as was the case in the European Commission vs Hungarian Government case regarding criteria used in highway construction tenders[12]).
4. Different types of evaluation criteria are prone to manipulation to different degrees, subjective, hard-to-quantify criteria such as the quality of company organigram rather than quantitative or price-related criteria often accompany rigged assessment procedures as it creates room for discretion and limits accountability mechanisms. In some cases, nevertheless, price-only criteria can also be abused for corrupt goals whereby the well-connected firm bids with the lowest price knowing that quality will not be monitored thoroughly or a contract modification will allow for charging higher prices.

12 http://akadalymentes.kormany.hu/download/c/c0/30000/K%C3%B6zlem%C3%A9ny_alkalmass%C3%A1g_2014_12_02%20(2).pdf

5. If the time used to decide on the submitted bids is excessively short or lengthy, it can signal corruption risks. Snap decisions may reflect premediated assessment, that is when there was no serious consideration of bids because the winner was already known. A long decision period is often due to a legal challenge mounted against the decision making process or the initial award decision whereby the announcement of the final, binding award decision is delayed until the first instance court or arbitration board reached a conclusion. In such cases the suggested outright violation of laws is the foundation for defining corruption risks.

Table A1. Overview of corruption 'red flags'

Proc. phase	Indicator name	Indicator values
Submission	Call for tenders publication (non-open procedures)	0=call for tender published in official journal 1=NO call for tender published in official journal
	Procedure type	0=open 1=non-open (accelerated, restricted, award without publication, negotiated, tender without competition)
	Length of advertisement period	Number of days between the publication of call for tenders and the submission deadline
Assessment	Evaluation criteria	Sum of weights for evaluation criteria which are NOT related to prices and quantitative requirements[13]
	Length of decision period	Number of days between submission deadline and announcing contract award
Outcome	Single bidder contract (valid/received)	0=more than 1 bid received 1=1 bid received

Each of the two corruption risk indicators, single bidding and CRI, have its pros and cons. The strength of the single bidder indicator is that it is very simple and straightforward to interpret. However, it is also more prone to gaming by corrupt actors due to its simplicity such as including fake bidders to mimic competition. In the

[13] In TED, information on award criteria was available in an unstructured text variable along with the weight of each criterion. Applying text mining techniques, looking for keywords such as price, cost, wage, etc., we calculated the weight of quantitative criteria standardized between 0 and 100, 0 meaning no quantitative criteria was considered in the awarding process, 100 implying that there was only quantitative criteria considered. In those countries, when there were too few contracts with qualitative information on weights (i.e. texts for text mining), we used a binary variable available in every contract award announcement which takes value 0 if "Most economically advantageous tender" and 1 if "Lowest price" criteria was used.

case of justified purchases of highly specific products, single bidding may over-estimate corruption risks, even though defining highly specific purchases to match the specific characteristics of the connected bidder is reportedly a major form of corrupt contracting.

The strength of the composite indicator approach (CRI) is that it explicitly tries to abstract from diverse market realities to capture the underlying corruption techniques. It allows for 'red flag' definitions to change from context to context in order to capture similar levels of risk irrespective of the detailed forms of corruption techniques used (e.g. normal competitive conditions imply tighter submission deadlines in the Netherlands than in Greece, hence corrupt behaviour would reflect deviations from slightly different normal benchmarks). This flexibility in corruption indices aims to assure that the same level of risk is associated with a similar level of actual corruption in a comparative perspective. In addition, as corruption techniques used at any point in time are likely to be diverse, tracking multiple possible corruption strategies in one composite score is most likely to remain consistent even if the composition of underlying corruption techniques changes. Both of these characteristics underpin its usefulness for international and time-series comparative research. The main weakness of CRI is that it can only capture a subset of corruption strategies, arguably the simplest ones, hence it misses out on sophisticated types of corruption such as corruption combined with inter-bidder collusion. As long as simplest strategies are the cheapest for corrupt groups, they are likely to represent the most widespread forms of corrupt behaviour. However, it is admitted that more sophisticated corruption techniques are more likely to be used when monitoring institutions are stronger, implying that the level of corruption may be under-estimated in less corrupt countries. Further research should expand on the set

of red flags tracked and evaluate the interaction between monitoring institutions, regulatory complexity, and corruption sophistication in order to more precisely estimate corruption.

ANNEX B – ADDITIONAL VALIDITY TESTS

Table B1: Bivariate Pearson correlations of % single bidder and the CRI with survey-based corruption indicators, on the country level, 2009-2013

Indicator	Single bidder	CRI	N
WGI - Control of Corruption (2013)	-0.7120*	-0.6933*	28
TI- Corruption Perceptions Index (2013)	-0.6903*	-0.6662*	28
GCI - Favouritism in decisions of government officials (2013)	-0.7003*	-0.6342*	28
Eurobarometer company corruption perceptions (2013)	0.5645*	0.6163*	25

*Note: * = significant at the 5% level*

Table B2: Correlation between individual components of CRI and corruption perceptions, 2009-2013, EU27 pus Norway

Variable	Single bidder	No CFT	Procedure type	Weight of non-price crit.	Adv. period	Dec. period
WGI - Control of Corruption (2013)	-0.7120	-0.1350	-0.0954	-0.3634	-0.1715	-0.1206
TI - Corruption Perceptions Index (2013)	-0.6903	-0.1323	-0.0832	-0.3525	-0.1731	-0.1118
GCI - Favouritism in decisions of government officials (2013)	-0.7003	-0.1223	-0.0444	-0.3962	-0.0209	-0.1359
N	28	28	25	27	25	28
Eurobarometer company corruption perceptions (2013)	0.5645	-0.0658	-0.1308	0.4002	0.1406	0.1819
N	25	25	23	24	22	25

ANNEX C – DESCRIPTIVE STATISTICS OF CORRUPTION 'RED FLAGS'

Table C1. Descriptive statistics of corruption inputs, 2009-2014, EU27 plus Norway

	mean	min	max	sd	N
Single bidder contract	0.232	0.00	1.00	0.42	1892421
Call for tender not published in official journal	0.387	0.00	2.00	0.64	2381467
Length of submission period in days	44.358	1.00	784	20.48	1661258
Relative price of tender documentation	0.849	0.3	1	0.17	542613
Weight of non-price evaluation criteria	47	0.00	100	31.39	992329
Length of decision period in days	87.06	1	31851	101.89	1544507

Figure C1. Average % single bidding contracts by country, 2009-2014, EU27 plus Norway

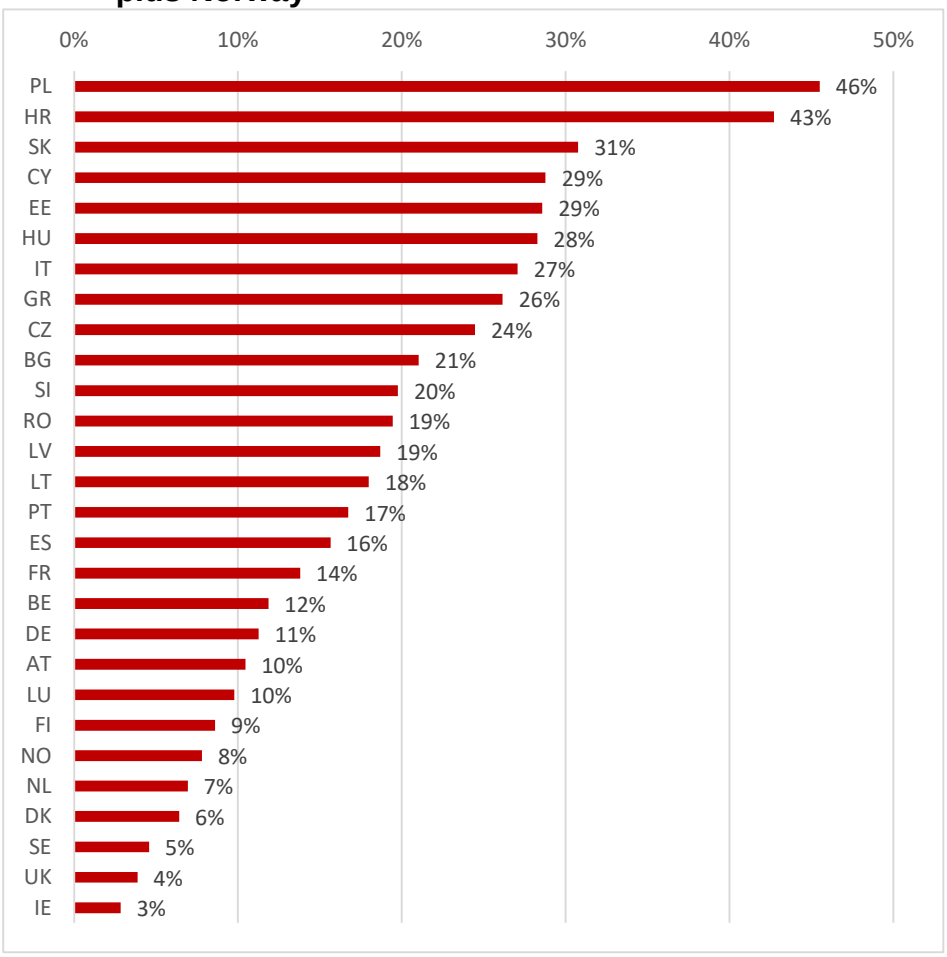

Figure C2. Average % single bidding contracts by product group (CPV divisions), 2009-2014, EU27 plus Norway

Table C2. Distribution of procedure type, 2009-2014, EU27 plus Norway

Type of procedure type followed	N	%
Accelerated negotiated procedure	4,253	0.18
Accelerated restricted procedure	12,780	0.54
Award without publication	60,198	2.53
Competitive dialogue	3,664	0.15
Negotiated with competition	107,701	4.52
Negotiated without competition	51,942	2.18
Open	1,997,843	83.89
Restricted	127,336	5.35
Missing/error	15,750	0.66
Total	2,381,467	100

ANNEX D – DESCRIPTIVE STATISTICS OF CONTROL VARIABLES

Table D1. Descriptive statistics of log contract value, 2009-2014, EU27 plus Norway

Variable name	mean	min	max	sd	N
log real contract value	10.866	5.14	23.03	2.43	1,678,656

Table D2. Distribution of issuer type, 2009-2014, EU27 plus Norway

Type of issuer	N	%
Central government	190,387	7.99
Local authorities	558,596	23.46
Water, energy, transport, and telecom	145,029	8.09
EU institutions	8,416	0.35
Body governed by public law	695,618	29.21
National or federal Agency/Office	43,708	1.84
Regional or local Agency/Office	52,859	2.22
Other	550,01	23.10
Missing	136,844	5.57
Total	2,381,467	100

Table D3. Distribution of issuer main sector, 2009-2014, EU27 plus Norway

Main sector of issuer	N	%
Defence	46,082	1.94
Economical	30,860	1.30
Education	120,841	5.07
Electricity	37,303	1.57
Environment	39,830	1.67
General public services	420,814	17.67
Health	779,992	32.75
Housing	68,893	2.89
Missing	197,444	8.29
Other	256,511	10.77
Port/airport-related	7,500	0.31
Postal	15,286	0.64
Production	7,563	0.32
Public order	28,274	1.19
Railway	35,841	1.50
Recreation	12,494	0.52
Social	19,189	0.81
Water	9,968	0.42
Missing	246,782	10.36
Total	2,381,467	100

Table D4. Distribution of contract award year, 2009-2014, EU27 plus Norway

Year of contract award	N	%
2009	339,386	14.25
2010	376,224	15.80
2011	401,016	16.84
2012	417,897	17.55
2013	418,965	17.59
2014	427,979	17.97
Total	2,381,467	100.00

Table D5. Distribution of main market of contract, 2009-2014, EU27 plus Norway

Main market of contract	N	%
Agricultural, farming, fishing, forestry and related products	8,952	0.38
Petroleum products, fuel, electricity and other sources of energy	44,654	1.88
Mining, basic metals and related products	4,857	0.20
Food, beverages, tobacco and related products	98,641	4.15
Agricultural machinery	2,730	0.11
Clothing, footwear, luggage articles and accessories	15,869	0.67
Leather and textile fabrics, plastic and rubber materials	4,010	0.17
Printed matter and related products	16,424	0.69
Chemical products	17,875	0.75
Office and computing machinery, equipment and supplies except furniture and software packages	46,499	1.96
Electrical machinery, apparatus, equipment and consumables; Lighting	18,878	0.79
Radio, television, communication, telecommunication and related equipment	12,356	0.52
Medical equipment, pharmaceuticals and personal care products	771,803	32.45
Transport equipment and auxiliary products to transportation	74,890	3.15
Security, fire-fighting, police and defence equipment	8,708	0.37
Musical instruments, sport goods, games, toys, handicraft, art materials and accessories	4,085	0.17
Laboratory, optical and precision equipments (excl. glasses)	33,632	1.41
Furniture (incl. office furniture), furnishings, domestic appliances (excl. lighting) and cleaning products	47,527	2.00
Collected and purified water	434	0.02
Industrial machinery	15,370	0.65
Machinery for mining, quarrying, construction equipment	6,128	0.26
Construction structures and materials; auxiliary products to construction (excepts electric apparatus)	34,711	1.46
Construction work	270,515	11.37
Software package and information systems	11,723	0.49
Repair and maintenance services	69,893	2.94
Installation services (except software)	1,299	0.05
Hotel, restaurant and retail trade services	14,732	0.62
Transport services (excl. Waste transport)	95,938	4.03
Supporting and auxiliary transport services; travel agencies services	4,676	0.20
Postal and telecommunications services	18,736	0.79
Public utilities	5,165	0.22
Financial and insurance services	59,150	2.49
Real estate services	3,372	0.14
Architectural, construction, engineering and inspection services	95,656	4.02
IT services: consulting, software development, Internet and support	41,439	1.74
Research and development services and related consultancy services	7,968	0.34
Administration, defence and social security services	5,271	0.22
Services related to the oil and gas industry	888	0.04
Agricultural, forestry, horticultural, aquacultural and apicultural services	62,789	2.64
Business services: law, marketing, consulting, recruitment, printing and security	81,213	3.41
Education and training services	57,102	2.40
Health and social work services	56,833	2.39
Sewage-, refuse-, cleaning-, and environmental services	107,701	4.53
Recreational, cultural and sporting services	7,243	0.30
Other community, social and personal services	10,114	0.43
Total	2,378,449	100

Table D6. Distribution of contracts by country, 2009-2014, EU27 plus Norway

Country code	N	Percent
AT	15,082	0.63
BE	31,429	1.32
BG	33,423	1.40
CY	4,872	0.20
CZ	28,036	1.18
DE	157,993	6.63
DK	25,676	1.08
EE	7,308	0.31
ES	111,705	4.69
FI	34,034	1.43
FR	725,636	30.47
GR	16,709	0.70
HR	4,058	0.17
HU	28,177	1.18
IE	14,183	0.60
IT	102,286	4.30
LT	32,905	1.38
LU	3,543	0.15
LV	56,148	2.36
NL	28,772	1.21
NO	16,786	0.70
PL	547,373	22.98
PT	10,386	0.44
RO	86,917	3.65
SE	43,152	1.81
SI	33,721	1.42
SK	12,965	0.54
UK	168,192	7.06
Total	2,381,467	100.00

ANNEX E – RED FLAG DEFINITIONS

Table E1. Lack of call for tenders publication in TED red flags by country, 2009-2014, EU27 plus Norway

Country code	NO Call for Tenders publication is red flag
AT	Yes
BE	Yes
BG	No
CY	Yes
CZ	Yes
DE	Yes
DK	No
EE	No
ES	No
FI	Yes
FR	Yes
GR	Yes
HR	Yes
HU	Yes
IE	Yes
IT	Yes
LT	No
LU	Yes
LV	Yes
NL	Yes
NO	Yes
PL	Yes
PT	Yes
RO	Yes
SE	Yes
SI	Yes
SK	Yes
UK	Yes

Table E2. Non-open procedure type red flags by country, 2009-2014, EU27 plus Norway

Country Code	Accelerated negotiated	Accelerated restricted	Award without publication	Competitive dialogue	Negotiated with competition	Negotiated without competition	Open	Restricted	Missing/error
AT	Yes	No	Yes	Yes	No	Yes	No	No	No
BE	Yes	No	Yes	No	Yes	Yes	No	No	No
BG	No	No	Yes	No	Yes	Yes	No	Yes	No
CY	No	No	No	No	No	No	No	No	No
CZ	Yes	No	Yes	Yes	No	Yes	No	No	No
DE	Yes	Yes	Yes	No	Yes	Yes	No	No	No
DK	No	No	Yes	Yes	Yes	Yes	No	No	No
EE	Yes	No	Yes	Yes	No	Yes	No	No	Yes
ES	Yes	No	Yes	No	Yes	Yes	No	No	No
FI	No	Yes	Yes	No	Yes	Yes	No	No	No
FR	Yes	Yes	No	No	Yes	Yes	No	No	No
GR	No	No	No	No	No	No	No	No	No
HR	No	No	No	No	No	No	No	Yes	No
HU	Yes	Yes	No	No	Yes	Yes	No	No	No
IE	No	No	No	Yes	Yes	No	No	No	No
IT	Yes	No	Yes	No	No	Yes	No	Yes	No
LT	No	No	No	No	Yes	Yes	No	No	No
LU	No	No	No	No	No	No	No	No	No
LV	No	No	Yes	No	Yes	Yes	No	No	No
NL	Yes	No	Yes	No	No	Yes	No	No	No
NO	Yes	No	Yes	No	Yes	Yes	No	No	No
PL	Yes	No	Yes	No	Yes	Yes	No	Yes	No
PT	No	No	Yes	No	No	Yes	No	No	Yes
RO	Yes	Yes	No	Yes	No	Yes	No	No	No
SE	No	No	No	No	No	Yes	No	No	No
SI	Yes	No	Yes	Yes	No	Yes	No	No	No
SK	Yes	Yes	No	No	Yes	Yes	No	No	No
UK	No	Yes	Yes	No	Yes	Yes	No	No	No

Table E3. Advertisement period thresholds red flags by country, number of calendar days, 2009-2014, EU27 plus Norway

Country code	red flag	not red flag	is "missing" red flag
AT	0-20;34-47	21-33;48-	
BE	18-34;78-		Yes
BG	0-28;35-	29-34	
CY	0-46;53-60	47-52;61-	
CZ	0-50	51-	
DE			
DK	52-61	0-51;62-	
EE	0-32;50-57	33-49;58-	
ES	39-42;52-	0-38;43-51	
FI	0-39;52-	40-51	
FR	0-40	41-	
GR	0-54	55-	
HR	0-40;49-	41-48	
HU			
IE	41-	0-40	
IT	0-47	48-	
LT	40-42;48-	0-39;43-47	
LU	51-54;86-	0-50;55-85	
LV	0-40;51-57	41-50;58-	
NL	0-38;48-56	39-47;57-	
NO	36-42;50-56	0-35;43-49;57-	
PL	0-25;43-	26-42	
PT	0-42	43-	
RO	41-50	0-40;51-	
SE			
SI	51-	0-50	
SK	49-52	0-48;53-	
UK	0-53	54-	

Table E4. Decision period thresholds red flags by country, number of calendar days, 2009-2014, EU27 plus Norway

Country code	red flag	not red flag	is “missing” red flag
AT	0-56	57-	Yes
BE	0-22	23-	
BG	0-27;120-	28-119	
CY	0-90	91-	
CZ	0-147	148-	
DE	0-36	37-	Yes
DK	0-39;124-168	40-123	
EE	0-41	42-	Yes
ES	0-43	44-	
FI	0-65;92-127	66-91;128-	
FR	0-66;156-	67-155	
GR	0-170	171-	
HR	0-26	27-	
HU	0-46;73-104	47-72;104-	
IE	0-50;87-	51-86	
IT	0-200	201-	
LT	0-32	33-	
LU	0-52	53-	
LV	0-20;106-	21-105	
NL	0-34;58-	35-57	
NO	0-70;98-229	71-97;230-	
PL	0-63	64-	Yes
PT	0-63;243-	64-242	
RO	0-56	57-	Yes
SE	0-44;89-	45-88	
SI	0-51;77-	52-76	
SK	0-68	69-	
UK	0-35;165-304	36-164;305-	

Table E5. Non-quantitative assessment criteria weight red flags by country, number of calendar days, 2009-2014, EU27 plus Norway

Country code	red flag	not red flag
AT	0-39;61-100	40-60
BE	0-30;71-100	31-70
BG	“Lowest price”	
CY		
CZ	“Most economically advantageous tender”	
DE	0-47;66-100	48-65
DK	66-100	0-65
EE	11-40;71-100	0-10;41-70
ES	“Lowest price”	
FI	0-20;56-100	21-55
FR	0-35	36-100
GR	“Most economically advantageous tender”	
HR	“lowest price”	
HU	60-92	0-59;93-100
IE	21-40	0-20;41-100
IT	0-65	66-100
LT	0-40;61-100	41-60
LU	“Lowest price”	
LV	61-100	0-60
NL	0-55	56-100
NO	0-20	21-100
PL	0-40	41-100
PT	“Lowest price”	
RO	0-49	50-100
SE	20-30	0-19;31-100
SI	0-15;26-60	16-25;61-100
SK	“Lowest price”	
UK	0-45;71-100	46-70

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