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Compliance and strategic contract manipulation around single market regulatory thresholds – the case of Poland

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Abstract

The functioning of the EU's single market in government contracts crucially hinges upon compliance with and adequate use of EU-wide rules. However, evidence from a range of countries suggest that these rules are circumvented and manipulated tenders are used to pursue protectionist or favouritistic agendas. In order to test whether such claims also apply to Polish public procurement we investigate the extent of non-compliance and manipulation around the regulatory thresholds defining whether national or EU-rules apply. In addition, we also explore the potential reasons behind observed strategic manipulations. We find that there is a non-negligible amount of potential non-compliance, that is sheer ignorance of the rules, amounting to up to 0.4% of tenders; and there is also strategic contract value manipulation just below EU thresholds. Such malpractices are likely due to both favouritistic and bureaucratic effort minimisation motifs potentially decreasing competitiveness and value for money. EU regulations are associated with better outcomes such as 5-22% higher bidder number.

Keywords

Compliance, corruption, public procurement, measurement, objective indicators, thresholds

1. Introduction

Public procurement in Europe as well as in Poland is highly regulated, imposing tight constraints on procuring bodies and their administrators limiting their discretion. The expectation is that by limiting discretion, the likelihood of wrongdoing such as corruption is lowered. However, prescribing detailed procedural, transparency, and record keeping behaviours is only effective if i) rules are followed throughout the whole public procurement system; and ii) in the absence of such tight requirements bureaucrats would misbehave. Without thorough statistical analysis of the complete Polish public procurement administrative dataset, we lack any systematic knowledge on whether these two assumptions of effective regulation are actually met. Therefore, this chapter is set out to analyse certain administrative qualities: i) the degree of compliance with the rules and ii) establishing the effect of following stringent regulations on public procurement outcomes. This study uses a unique dataset containing both below and above EU-threshold contracts in order to investigate compliance with regulations, strategic responses to regulatory requirements and the resulting tendering outcomes.

Due to the lack of appropriate data, there is only scattered evidence on compliance with the EU regulations (see e.g. Commission of the European Communities, 1996; Martin, Hartley, & Cox, 1999)), especially on the tender publication practices above the EU regulatory thresholds. Therefore, identifying the potential extent of non-compliance – i.e. tenders published according to the national legislation instead of EU rules – is in itself a novel result (section 4).

Non-compliance is also investigated in situations when tender values are manipulated in order to avoid more stringent rules. Therefore, we also test for strategic bunching around the EU threshold, whereas estimated tender values are deflated so that national level rules can be followed (section 5). As conducting an EU-regulated procedure is more costly for public authorities, avoiding it can motivate some organisations to manipulate contract values (Strand, Ramada, & Canton, 2011). By implication, the strategic positioning of public contracts around different regulatory thresholds can hide wrongdoing (Pertold & Palguta, 2017). In order to identify different motivations behind strategic responses to regulatory constraints, we also consider simple tendering outcomes, such as bidder numbers and prices (section 6) that can serve as a proxy of particularistic resource allocation (e.g. Fazekas, Tóth, & King, 2013).

We found significant strategic contract value manipulation around the EU thresholds in Poland and we show that the tenders affected by manipulation have significantly fewer bidders and a higher rate of single bidding. The difference of these variables in the close proximity of the threshold is higher compared to the difference between all below and above threshold contracts, suggesting that additional market restriction can play a role in manipulating tender values. These can be considered as tentative evidence for strategic bunching around the threshold being partly motivated by restricting competition for corrupt purposes while most certainly simply cutting regulatory costs without corrupt motives also plays a role.

2. Theory
Prior literature

Non-compliance with the EU Directives is not a new phenomenon. It was shown previously that a significant ratio of tenders were not published according to the applicable legislation (Commission of the European Communities, 1996; Martin et al., 1999). There can be various reasons explaining publication avoidance, such as misunderstanding publication requirements[3] and the lack of their active enforcement (Commission of the European Communities, 1996) or organizational incentives[4] (Gelderman et al., 2006) etc. While we have only scattered evidence on the relative importance of these various factors, the survey-based study of Gelderman et al. (2006) suggests that both unfamiliarity with the EU level public procurement rules and organizational incentives play a significant role in non-compliance. However, disobeying the rules can be also a consequence of a conscious strategy, whereby contracting authorities avoid international competition in order to promoting national or connected companies.

While compliance with the EU regulations is expected to have significantly improved in the last years, the lack of a centralized, automatic monitoring system leaves space for buyers to get around their legal obligations. It is important to emphasize, that the primary enforcement mechanism is decentralised, relying on national courts or arbitration bodies where remedies are pursued by companies or stakeholders who consider their rights were infringed. Second, they can also take these cases to the European Commission and these procedures can lead to penalties imposed by the European Court of Justice.[5]

Previous literature focusing on tendering outcomes around regulatory thresholds addresses two main questions: i) whether there is bunching around regulatory thresholds (i.e. strategic manipulation of contract values); and ii) what its effect on tendering outcomes is. While it is expected to observe some – even legitimate – clustering around these thresholds, the magnitude of manipulation around regulatory cut-points often turned out to be significant. Palguta and Pertold (2017) shows that the bunching of contracts below national regulatory thresholds allowing for less competitive tendering procedures6 can be large: they find a multiple times higher ratio of contracts below the threshold compared to the interpolated expected values in the Czech public procurement market. Similarly, Bobilev et al. (2015) shows significant bunching around the EU threshold7 in Sweden especially for supplies and services procured by central government authorities, while non-significant differences were found for non-central authorities as well; although low data quality makes these findings problematic.8 However, there are instances when no significant strategical bunching takes places as in showed in Coviello et al. (2016). They analysed a cut-point within the Italian national regulation allowing for less restrictive procedures below EUR 300,000 in case of public works contracts. Even though each of these studies refer to different countries and thresholds delineating different regulatory regimes, they offer no clear-cut expectations

[3] For example, misinterpreting the aggregation rule - i.e. in case of multiple contracts per tender, the sum of contract value estimates should be the basis for above threshold publication (Commission of the European Communities, 1996).
[4] For example, internal sanctions could increase compliance.
[5] A more detailed discussion can be found on this topic in OECD (2007).
[6] Contracting authorities can follow a restricted procedure below the threshold, where inviting at least 5 bidding companies is sufficient.
[7] EU threshold refer to the threshold above which the contracting authorities need to follow the rules specified in the EU-level public procurement directives.
[8] The authors emphasize that the relatively small number of observations around the threshold can explain

regarding strategic splitting of contracts to artificially go under the EU reporting threshold. As the EU threshold its associated with a significant jump in regulatory requirements, strategic responses are more likely than in many of the previously analysed contexts.

Tendering outcomes can be different by regulatory regimes used below and above the thresholds even if tender values are not manipulated, simply due to the differences in regulations duly followed. Therefore, the main question is whether less stringent rules lead to less competitive tenders or more expensive contracts and whether these effects are amplified by strategic manipulation of contract values. Regulatory requirements differ in many ways between the Polish national and EU-level rules: increased transparency rules, longer advertisement periods, closed lists for bidder exclusion grounds or bidding requirements etc. Nevertheless, the main rationale behind all these additional rules is to limit the scope of bureaucratic discretion, so that the impartial allocation of contracts is ensured. However, eliminating discretion of buying organisations can be disadvantageous in certain cases too, for example when more flexibility is needed to deal with contractual uncertainties.

There is considerable evidence for both bad and good outcomes associated with different regulatory regimes around thresholds in public procurement. First, strategic bunching was associated with an increase in the use of a particular restricted procedure and a higher ratio of winning companies with untraceable beneficial owners in the Czech Republic (Palguta & Pertold, forthcoming). Furthermore, Coviello and Mariniello (2014) show that in Italy increased transparency (wider advertisement) around the regulatory threshold increase the number of bidders and the likelihood of winners coming outside of the region, while also lead to higher discounts. They find that this does not lead to increased ex post delays or subcontracting either. In a similar vein, wider advertisement of bidding opportunities through the introduction of electronic procurement was shown to increase the participation of companies coming outside of the region and increase contract implementation quality in India and Indonesia (Lewis-Faupel, Neggers, Olken, & Pande, 2014).

Second, Coviello et al. (2016) finds that using more restricted procedures does not affect the number of bidders, discounts, and winner company size and distance within close proximity of the regulatory cut-point (i.e. restricted procedures were easier to run below a certain threshold). However, discretion increased the chance of recurrent winning while decreased delays in the implementation phase. Therefore, they argue that the use of restrictive procedures can also support public management considerations. Similarly to Bandiera et al. (2009), this body of evidence suggests that a certain level of discretion is advantageous in public contracting.

However, unlike in Palguta and Pertold (2017), Coviello et al. (2016) find no strategic manipulation of contract values around the regulatory threshold, which suggests that the motivations and probabilities of wrongdoing around regulatory changes might be different according to the extent of tender size manipulation – i.e. bunching can be an indication of possible misconducts.

Nevertheless, simpler explanations can also play a significant role in contract value manipulation. Implementing a more open, but overall more bureaucratic procedure, can be deterring from many contracting authorities' perspective. A survey of 5500 contracting authorities shows that above EU-threshold tenders are regarded more costly (37% of respondents) and time consuming (59% of respondents) compared to a below EU-threshold procedure (Strand et al., 2011). Therefore, avoiding EU regulated tendering procedures can

be motivated by the efficient use of public resources. The question still remains: whether sparing time and procedural costs outweigh the possible gains of the EU-wide rules.

Hypotheses

A fundamental question of regulatory compliance in public procurement markets is whether contracting authorities follow publication requirements or not. Publication behaviour is of central importance for bidding outcomes as it determines the range of companies knowing about a bidding opportunity, hence the intensity of competition. Publication violations mean that contracting authorities explicitly or accidentally ignore regulations, potentially reducing the scope of competition through less transparency and more relaxed regulatory environment. Prior literature shows that non-compliance was a significant issue in various EU countries (see e.g. Commission of the European Communities, 1996; Martin et al., 1999). Based on these previous findings we hypothesise a non-negligible degree of non-compliance in the Polish public procurement market (H1).

The second way of contravening the applicable regulations is when procuring bodies and administrators are effectively trying to avoid regulations by either splitting contracts of deflating their estimated values which we call strategic bunching of contracts on one side of the threshold. Therefore, it can be defined as deviation from a distribution we would expect in the absence of a threshold. We formulate our general hypothesis based on experience in European countries of high as well as low integrity (i.e. Sweden, Czech Republic), arguing that if all these countries have extensive bunching, Poland is likely to have it too (of course a caveat is that different thresholds mean different regulatory frameworks so motivations for gaming contract values are different too). Therefore our second hypothesis (H2) is that there is bunching around the EU threshold in Poland.

However, manipulating tender values in order to apply different regulatory rules can be driven by various factors which have different substantive policy consequences. Therefore it is important to analyse whether strategic responses are associated with different tendering outcomes depending on the regulatory regime followed. We identified three plausible explanations. First, authorities can choose national rules to avoid increased transparency and monitoring, hence leaving more space for corruption. In this case, the tendering outcomes should be significantly worse for the below threshold contracts (H3.a). Second, contracting authorities may prefer the national regulatory regime to avoid the higher costs of conducting an EU-regulated procedure (Strand et al., 2011). In this case, we should not find any substantial difference between tenders just below and above the EU threshold in terms of bidding outcomes (H3.b).[9] Third, contracting authorities might think that following the national regulations leads to better procurement outcomes, as they can have wider discretion over the whole process hence they are able to take into account country specific considerations. This case should lead to better outcomes for tenders just below the threshold (H3.c).

Then, the empirical problem is how tendering outcomes are measured or what we define as ‘good’ and ‘bad’ practice. Unfortunately, there is only a few outcome variables for meaningful comparison, therefore we will restrict our analysis to bidder number, foreign suppliers, and relative prices when testing H3.a-b.

[9] There are significant regulatory differences between the two regimes, but contracting authorities could cherry pick the ones relevant for effective competition.

3. Data

Our database consists of two public procurement data sources: one containing EU regulated, another containing polish national regulated tenders. We use the official public procurement database released by the European Commission – DG GROW, which contains data on all procedures conducted under the EU Public Procurement Directives. We also use the database gathered by a joint project of the Government Transparency Institute and the Stefan Batory Foundation co-funded by the Open Society Foundations. This is based on the xml publication of the national level public procurement portal (i.e. below EU threshold tenders)[10].

Publication in the TED portal (hence inclusion in the TED database) is only mandatory above a certain threshold explicated in specific EU regulations for supplies, works and services, while contracting authorities can also choose to publish their tenders voluntarily in order to reach a wider set of potential suppliers. In order to avoid double counting we excluded all observations from the TED database that are only voluntarily published, i.e. are below the mandatory publication thresholds.[11] However, the national public procurement portal does not include tenders run according to the EU regulations (see chapter 5). Therefore, putting together the two data sources makes it possible to analyse strategic bunching around the EU-threshold.

In order to be able to pair and analyse the two different datasets according to regulatory regime, we need to take into account the different thresholds[12] applying for the different types of contracting authorities (central vs local) and contract types (i.e. supplies, services or works). The first apparent problem to resolve in this respect is that authority type categories are overly dispersed both in case of the below and above EU threshold tenders. Apparently, a large number of tenders are rather hard to categorize (i.e. the 'other' category), and certain authority types are hard to relate to the EU terminology, and there are multiple types of local authorities – just to name a few problems related to the assessment of the regulatory regime changes. Furthermore, the published authority type information do not correspond to the central authority type stipulated in the relevant EU Directives.[13]

In order to handle these data problems, first, we matched the authority names from the EU Directives to the names published both at the national and the TED database.[14] Second, we regrouped certain authority types both below and above the threshold, where the regulatory threshold could be paired – i.e. based on the EU law, every contracting body (besides defence, utilities and central authorities) follow the same rules as the local authorities, hence universities, health institutions etc. are treated equally.[15] Therefore, we use two aggregate categories, whereas local authorities also refer to bodies governed by public law, universities and health institutions, while central authorities include all authorities listed in the EU Directive (see the final categorization in Table 1).

Although this categorization is probably not perfect – e.g. authorities in the "other" categories are not included – it certainly alleviates a significant part of the sample selection problem.

[10] Website of the Polish Public Procurement Authority: https://www.uzp.gov.pl/en. The link of the Polish official publication website: http://bzp0.portal.uzp.gov.pl/index.php?ogloszenie=browser

[11] Due to the high ratio of missing data the filtering procedure used was based both on estimated values and final values.

[12] For the threshold, see Table 8 in the Annex.

[13] The central authorities are listed in Annex II in Directive.

[14] We used exact matching, hence it is possible that some authorities were not matched – i.e. those having typos or abbreviations in their names.

[15] See Figure 11- Figure 15 in the Annex displaying tender distributions, proving that different contracting authority types can be merged.

Furthermore, the potential bias introduced through sample selection is negative, hence we potentially underestimate the bunching around the threshold (see chapter 6).

TABLE 1: DISTRIBUTION OF CONTRACTS ACCORDING TO PURCHASE AND BUYER TYPE

	Local authority	Central authority	Total
Service	623723	50576	674299
Supplies	755776	17868	773644
Works	266335	13832	280167
Total	1645834	82276	1728110

An equally important question is whether price information is available for each tender, which enables to focus on the relevant subsample around the thresholds. Optimally, we should use estimated prices to identify our subsample, however, it is often not available hence the final contract value has to be used as a substitute. Furthermore, while it is the publication date of the call for tenders that distinguishes between different threshold values to be followed, this information is often missing. Therefore, we needed to use contract award dates in order to distinguish between tenders following different rules.[16] (i.e. whether 2012 or 2013 thresholds apply)

As a result, four 'theoretical' categorization can be applied: i) using only estimated price and call for tender publication date, ii) using estimated price and contract award publication date in case of missing call for tender date, iii) using contract value and call for tender publication date, iv) using contract price and contract award publication date.

Table 2 shows, that only a few additional observations can be added by using contract price for categorizing tenders to the appropriate regulatory regime in case of missing estimated price. Another interesting fact is that in case of contracts with contract award date, but missing call for tender publication date, there is no additional tender with contract value but missing estimated price (columns 5 and 6 in Table 2).

TABLE 2: NUMBER OF TENDERS WITH VARIOUS TYPES OF PRICE INFORMATION

Authority type	Contract type	Estimated value with call for tender date	Estimated value with contract award date	Estimated value or Final value with call for tender date	Estimated value or final value with call for tender or contract award date
Local	Supplies	192893	192961	195111	195111
	Services	263516	263642	272099	272099
	Works	196961	196975	197052	197052
Central	Supplies	8991	8993	9178	9178
	Services	19388	19392	20615	20615
	Works	8562	8562	8576	8576

*Only tenders with estimated price and call for tender date are included
** Tenders with contract price are added in case of missing estimated price
*** In addition to the second group, contracts with no call for tender publication date, but having contract price and contract award date are also added.

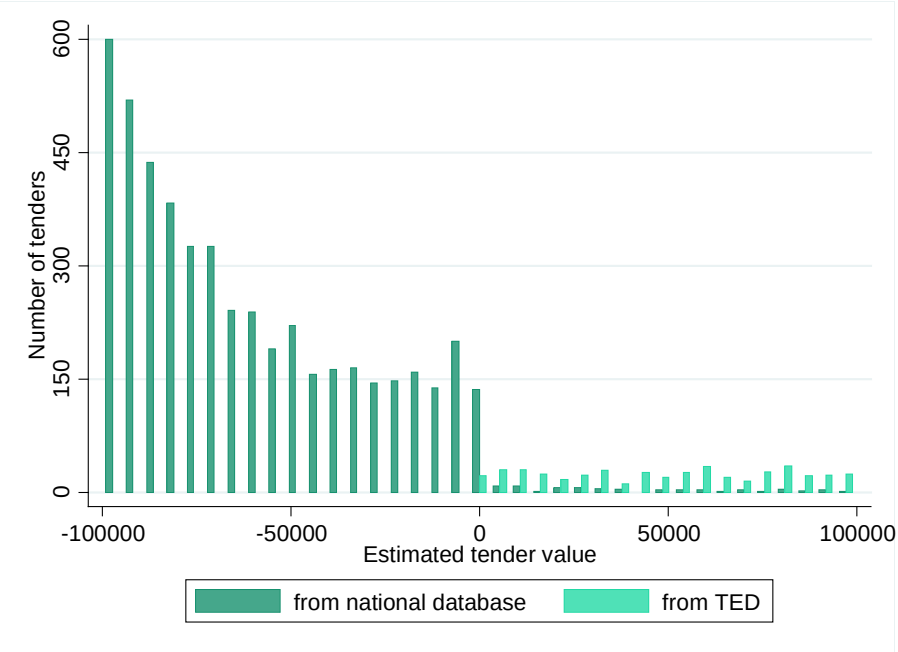
[16] In case of contract award dates, we used the median difference between call for tender and contract award dates and we used an estimated call for tender date. For example, if the contract award date if 15th of January, then based on the median time difference between the two publications we should assign the contract to the previous year that might also imply a different threshold to be applied.

We use the widest subsample throughout the analysis, hence we apply the wider local vs. central authority categorization and we use the broadest categorization in terms of prices and dates.

4. Potential non-compliance

By putting together data on the full universe of the Polish public procurement tenders, the first empirical question is whether contracting authorities comply with the relevant regulations. The above discussion in section 2 suggests, that there is considerable non-compliance irrespective of its motivations, which is supported by our empirical analysis. Plotting tenders around the EU threshold reveals, that while the publication of tenders under the national legislation drops significantly, non-compliance seems to be a non-negligible issue (Figure 1). It also shows, that while the number of tenders might not be significant at a large scale, it is comparable to the number of tenders published in TED. The estimated size of the likely non-compliance is reported in Table 1 by authority and tender categories, showing that its maximum is around 0.4% of tenders. Moreover, the ratio of voluntary publication (ratio of tenders that are published on the TED website while being under the publication threshold) seems to be comparable to other countries in most product categories (see columns TED portal (PL) and TED portal (all countries)).

FIGURE 1: NUMBER OF CONTRACTS AROUND THE EU PUBLICATION THRESHOLD – SERVICES, CENTRAL GOVERNMENTS[17]



[17] Note: we excluded the voluntarily published tenders in TED, as those publications do not count as 'non-compliance'. This graph is based on only those tenders, where both the estimated value and call for tender publication data was available. Although this is only a smaller set of the tenders, these are the only cases with unambiguous categorization into below and above threshold groups.

TABLE 3: RATIO OF NON-COMPLIANCE AND NUMBER OF TENDERS ASSESSED[18] (2010-2015)

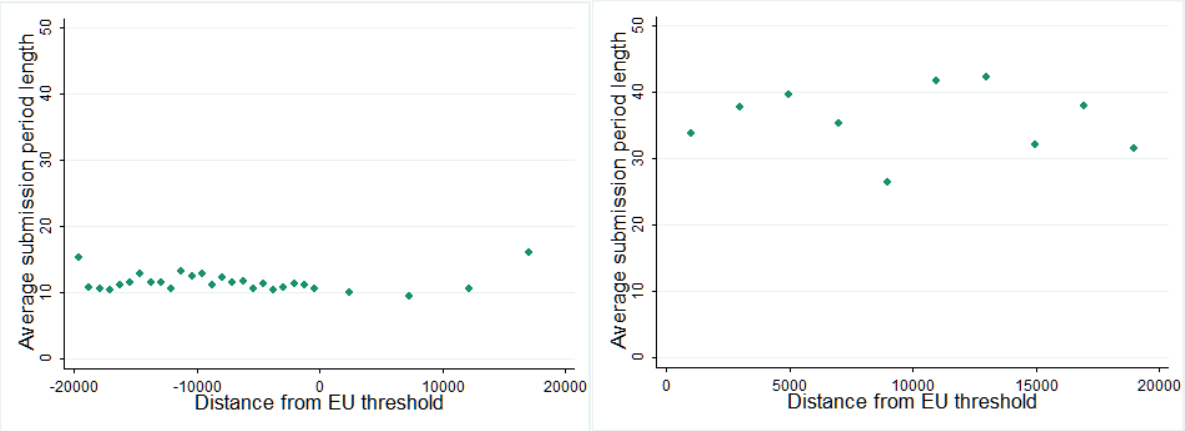
Contracting body and tender type		% of non-compliance			Sum of all national tenders assessed (PL)	Sum of all TED tenders assessed (TED - PL)
		National portal	TED portal (PL)	TED portal (all countries)		
Local	Services	0.2%	45%	45%	329089	33494
	Supplies	0.1%	52%	50%	230125	34016
	Works	0.0%	65%	75%	235043	3302
Central	Services	0.4%	37%	55%	25914	7737
	Supplies	0.3%	57%	72%	12054	4288
	Works	0.0%	36%	75%	11183	543
Total number of observations		843,408	83,380	668,540	843,408	83,380

To corroborate non-compliance, we did two further checks. First, by a small-sample non-random manual search we tried to find seemingly non-complying tenders from the national database among the TED publications. In this exercise we could not match the missing tenders with TED data, i.e. no double publication is likely to be the cause of the patterns identified. Nevertheless, a more comprehensive comparison should be conducted for an unambiguous verification. Second, we compared the submission period length between non-complying tenders and those published at the TED website. As there is a significant difference between the submission period set-out in the Polish national public procurement legislation[19] and the EU directives, we should observe a significant difference between these complying and non-complying tenders. Alternatively, non-complying tenders should have a longer (i.e. EU conform) submission period length, providing some evidence of missing publication at the TED website while complying with the EU regulations. Unfortunately, non-complying tenders have equally short bidding period length as the complying below threshold tenders, while those published at the TED portal seem to follow the longer bidding deadlines stipulated in the EU Directives (Figure 2). This suggests that the identified non-compliance with publication venue actually also implies non-compliance with the corresponding EU regulatory regime.

[18] Non-compliance refers to voluntary below EU threshold publication in case of the TED data. Note, in case of the TED related non-compliance calculations we used a simplified method for telling apart central and local authorities by simply using published buyer type. This makes the non-compliance estimations somewhat ambiguous, however, the estimation errors are moderate.

[19] In case of below threshold contracts, it is only 7 days for supplies and services, and 14 days for public works. In case of above EU threshold contracts, it is 30 days or more, depending on the procedure type (see e.g. Directive 2014/24 or the Articles 43, 49, 56 of the Polish Public Procurement Law of 2004)

FIGURE 2: AVERAGE LENGTH OF BIDDING DEADLINE AROUND THE THRESHOLD AROUND THE EU THRESHOLDS IN CASE OF TENDERS PUBLISHED IN THE NATIONAL DATABASE (LEFT) AND THE TED PORTAL (RIGHT) - SERVICES, CENTRAL GOVERNMENTS[20]



While, it is hard to grasp the exact motivations behind non-compliance, misinterpreting the regulations can be one of the reasons of non-compliance. One straightforward explanation is when the applicable regulation is based on a contract rather than a tender level estimated value. Analysing the average number of lots per tender below and above the EU threshold published only at the national portal reveals, that the average number of contracts per tender is significantly higher in case of the non-complying tenders. Furthermore, while the number of tenders with only one contract is below 1% both in case of local and central authorities in case of non-compliance, these rates are 32% and 36% respectively in case of compliance. This suggests, that non-compliance can be partly explained by misinterpreting the EU regulations – either deliberately or unwillingly.

TABLE 4: AVERAGE NUMBER OF LOTS PER TENDER FOR BELOW AND ABOVE EU THRESHOLD TENDERS PUBLISHED IN THE POLISH NATIONAL PUBLIC PROCUREMENT PORTAL

Contracting body and tender type		Below EU threshold	Above EU threshold
Local	Services	12.2	18.1
	Supplies	11.2	23.4
	Works	1.9	6.1
Central	Services	6.3	10.7
	Supplies	2.7	6.3
	Works	2.1	9.3

Although, there are mutually reinforcing signs of non-complying tendering procedures, it is important to emphasize, that a more rigorous analysis is necessary to get a clear picture on its real extent. For example, the compliance discrepancies can be also explained by i) systematically erroneous data entries (see e.g. Czibik, Tóth, & Fazekas (2015)), or ii) special exceptions, that the authors are not aware of.

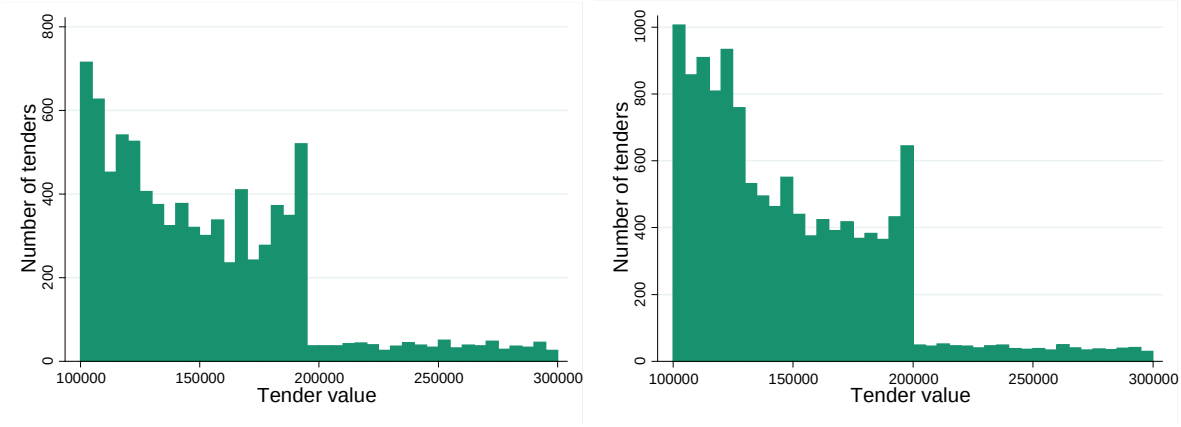
[20] Note: we excluded the voluntarily published tenders in TED, as those publication do not count as 'non-compliance'. This graph is based on only those tenders, where both the estimated value and call for tender publication data was available. Although this is only a smaller set of the tenders, these are the only cases with unambiguous categorization into below and above threshold groups.

5. Strategic contract value manipulation around thresholds

In this section, we discuss tender distributions around the EU publication threshold, so that we can identify strategic gaming with regards to tender size. In order to have a clear picture of its extent, we exclude all non-complying cases (see chapter 4). Therefore, both tenders published in the national portal but exceeding the EU threshold, and those voluntarily published at the TED portal while being under the threshold are excluded from the analysis.

The two examples below show that tender distributions follow the two-yearly threshold changes: the discontinuity point increases from EUR 193000 to EUR 200000 (Figure 3). Furthermore, it seems that besides bunching around the threshold, there is also a significant change in the whole distribution drastically decreasing publication volume above the EU threshold.

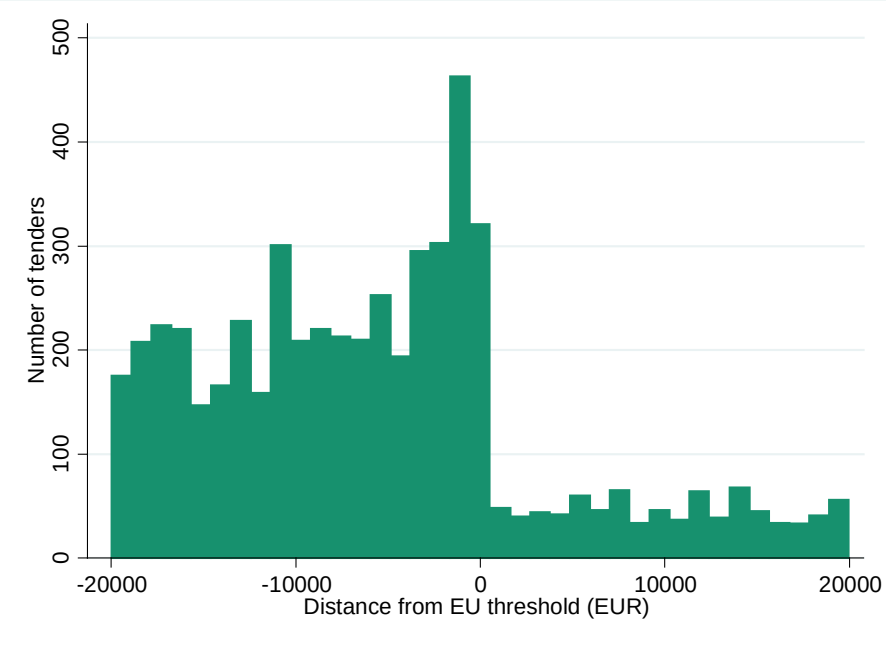
FIGURE 3: NUMBER OF TENDERS AROUND THE EU PUBLICATION THRESHOLD IN 2010-2011 (LEFT) AND 2012-2013 (RIGHT) – SERVICES, LOCAL GOVERNMENTS[21]



These distributions can be analysed more thoroughly by normalizing different years according to their threshold values. Figure 4 shows that for local governments' services contracts, there is not only a drop in the number of tenders, but also a significant increase right before the EU threshold. While the significant drop in the number of tenders above can be partly explained by the sorting of tenders, Figure 15 reveals, that non-compliance can be a rather important factor as well. Comparing Figure 4 and Figure 15 shows that the seemingly sizeable drop is smaller when we include non-complying contracts in the above EU threshold tender group.

[21] Only includes tenders with available estimated price and compliance, i.e. contracts published on the TED portal but below the EU threshold and those published only at the national portal but being above the threshold are excluded from the calculations.

FIGURE 4: NUMBER OF TENDERS (WITHOUT NON-COMPLIANCE) AROUND THE EU THRESHOLD (2010-2015)[22] – SERVICES, LOCAL GOVERNMENTS



While the graphs above show clear patterns of bunching around the threshold, this discontinuity can be tested formally as well. Similarly to Bobilev et al. (2015), we also present a density test introduced by McCrary (2008), where tender distributions are estimated by local linear regression on both sides of the discontinuity points (i.e. the EU thresholds). Similarly to the previous graphs, Figure 5 - Figure 7 show that there is significant discontinuity around the regulatory thresholds. In most relations, there seems to be a sharp increase in the number of contracts just before the threshold, while there is a significant drop in the number of contracts after the threshold in general.

While the latter problem could be traced back to sample selection problems – for example in case of differences in the availability of estimated and awarded contract values and publication dates between the national and TED data – the comparison of missing data ratios do not support this explanation.

Interestingly, there seems to be no significant difference between the overall behaviour of central and local authorities, both having similar degrees of strategic contract value manipulation around the threshold for service and supply contracts. For public works contracts, there are not enough observations around the EU threshold to show results for local and central bodies separately. However, as the same threshold applies for both authority types, we show the density tests together.

Based on a back-of-the-envelope calculation, the extra number of tenders published directly under the threshold is below 1% of the total number of tenders. However, these are only those tenders that were close to the publication threshold. Slicing up bigger contracts – another type of tender manipulation - can be also a problem that cannot be assessed precisely, while having the same motivation to those analysed in this study.

[22] Only complier contracts are included in the sample, i.e. contracts published on the TED portal but below the EU threshold and those published only at the national portal but being above the threshold are excluded from the calculations.

FIGURE 5: MCCRARY DENSITY TESTS FOR LOCAL (LEFT) AND CENTRAL (RIGHT) SERVICE TENDERS 2010-2015 (90% CONFIDENCE INTERVALS) – ONLY COMPLYING TENDERS

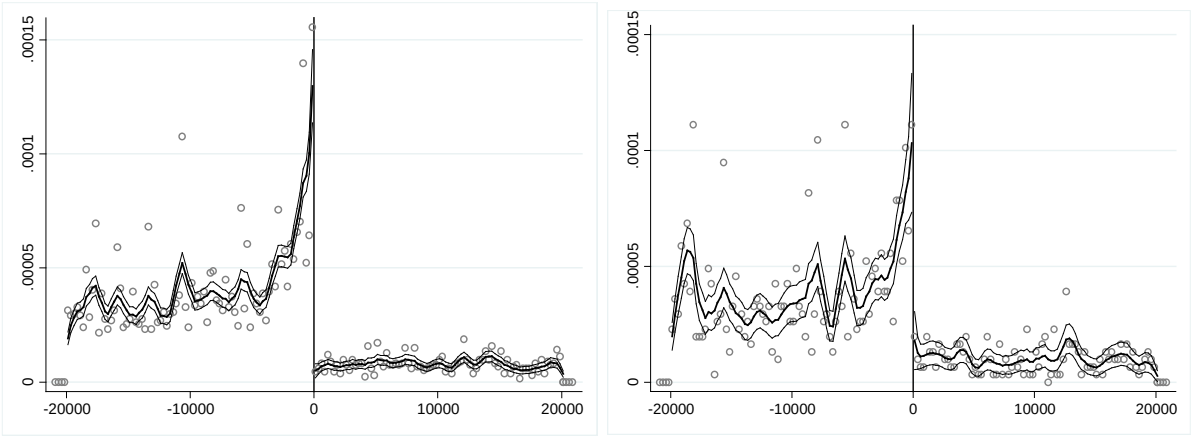


FIGURE 6: MCCRARY DENSITY TESTS FOR LOCAL (LEFT) AND CENTRAL (RIGHT) SUPPLY TENDERS 2010-2015 (90% CONFIDENCE INTERVALS) – ONLY COMPLYING TENDERS

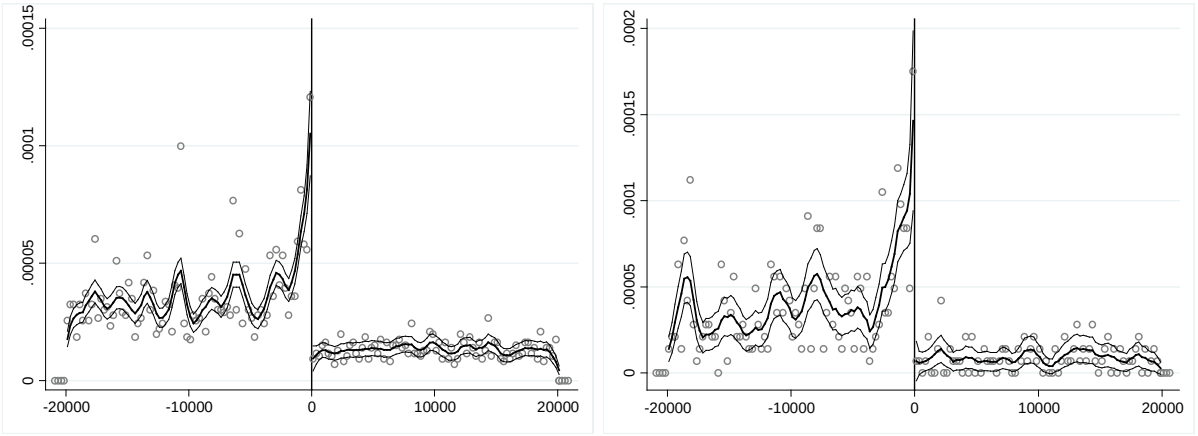
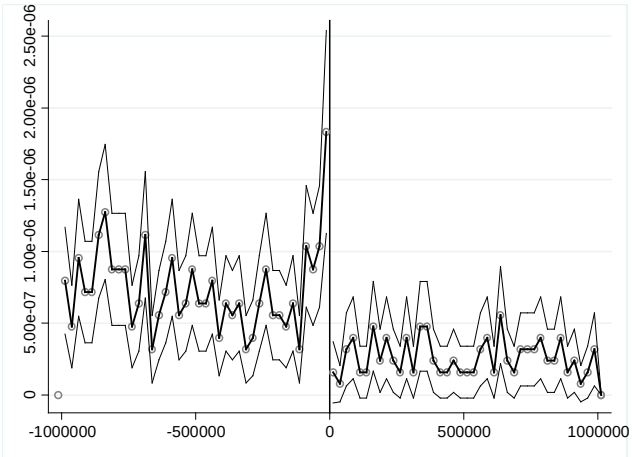


FIGURE 7: MCCRARY DENSITY TESTS FOR LOCAL AND CENTRAL PUBLIC WORKS TENDERS 2010-2015 (90% CONFIDENCE INTERVALS) – ONLY COMPLYING TENDERS



6. Difference outcomes around EU thresholds

Strategic splitting of tenders and deflating tender values can be regarded as suspicious practices, however, they can have various and often contradictory explanations according to prior literature. The effects of strategic manipulation are context dependent: different regulatory regimes, organizational capacities and incentives, and country specific institutional arrangements also play a role.

In this section, we will highlight some interesting differences in tender outcomes in the close proximity of EU thresholds. First, we demonstrate these differences through exemplary graphical analyses. Second, we test the differences both around the threshold and for all below and above EU threshold contracts, to demonstrate whether the tenders affected by suspected manipulation are indeed different from the ones without strategic splitting.

It is important to emphasize that the differences shown below are not conclusive in terms of the exact causal link driving results. As there are many factors changing around the threshold – e.g. transparency, minimum advertisement period, means of advertisement, many procedural rules etc. – and bunching introduces selection issues, it is not possible to precisely identify the different effects.

Graphical examples of procedure outcomes around EU thresholds

This section shows three examples of how procuring below and above the EU threshold affect bidding patterns and price outcomes. First, one of the most important characteristic of any bidding procedure is the number of submitted valid bids. It is apparent from Figure 8, that there is a significant difference between the below and above EU threshold tenders in case of service contracts procured by local contracting authorities. However, it is hard to assign this increase to any specific regulatory change around the threshold as both the length of the bidding period and scope of advertisement etc. should increase the number of bidders.

Second, the average number of bidders is not necessarily a good proxy for detecting potential market distortions. As it was argued for example in Fazekas, Tóth, & King (2016), single bidding (i.e. when the contract has only one submitted bid) is a useful proxy for identifying contract related corruption risks. Figure 9 points out that the ratio of single bidder contracts rarely goes above 0.5 in case of above threshold contracts, while there is also a drop in their share right after the threshold value. Consequently, it seems that tenders conducted according to the EU regulation insure against the excess number of single bidder contracts to a limited degree.

FIGURE 8: AVERAGE NUMBER OF BIDDERS AROUND THE EU PUBLICATION THRESHOLD (2010-2015) – LOCAL AUTHORITIES, SERVICES[23]

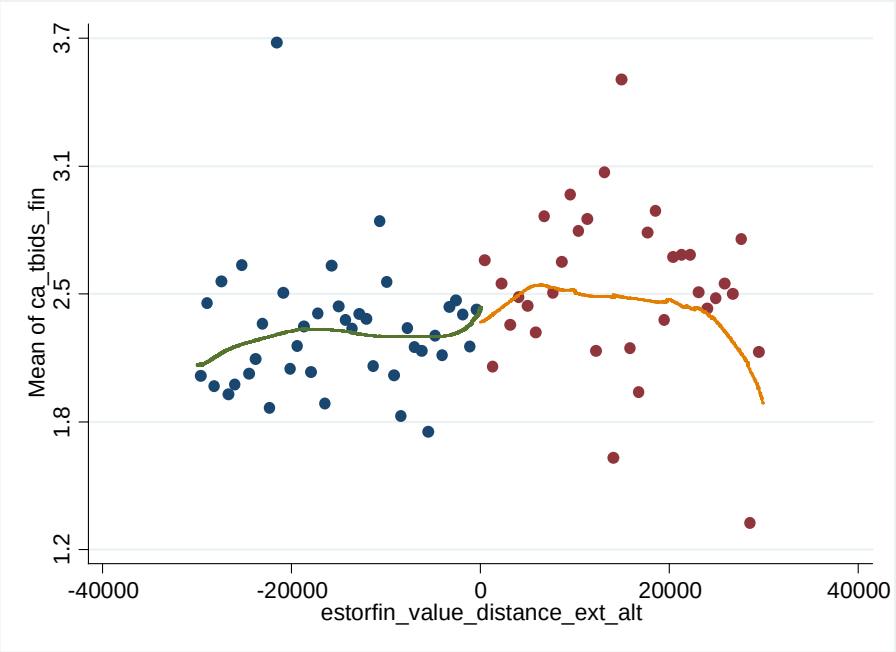
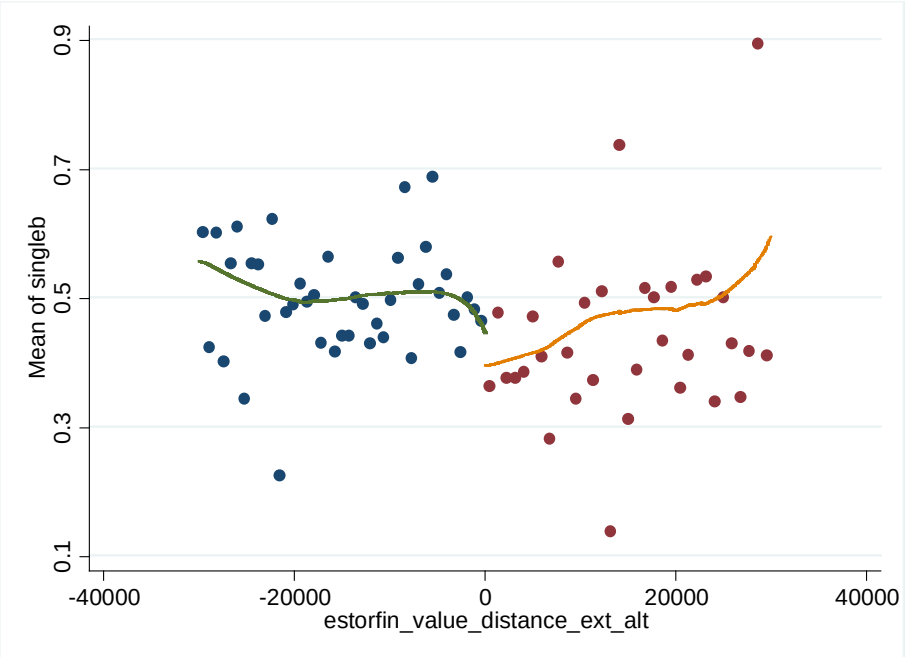


FIGURE 9: RATIO OF SINGLE BIDDER CONTRACTS AROUND THE EU THRESHOLD (2010-2015) – LOCAL AUTHORITIES, SERVICES[24]



[23] Only complier contracts are included in the sample, i.e. contracts published on the TED portal but below the EU threshold and those published only at the national portal but being above the threshold are excluded from the calculations. Only those tenders are considered

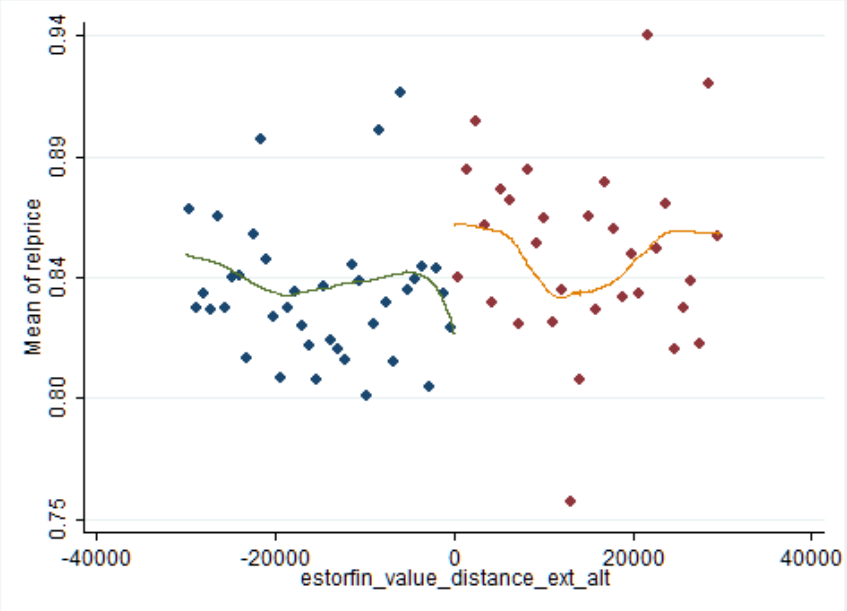
[24] Only complier contracts are included in the sample, i.e. contracts published on the TED portal but below the EU threshold and those published only at the national portal but being above the threshold are excluded from the calculations.

While the previous two examples were focusing on bidder numbers, it is equally important to investigate the possible price effects around the threshold values. A rather straightforward, and widely used measure of price competition is the relative price which is defined as the ratio between the contract value and the initial price estimation. Effective competition should lead to lower prices in general[25], hence we expect a difference between below and above threshold contracts.

Unfortunately, there is a technical problem stemming from the imprecisely defined announcement templates used in Poland. While net values have to be inputted in case of estimated values, the final prices should be given as gross numbers according to the rule.[26] However, this is not explicitly referred to in the announcement templates leading to a seemingly ad hoc use of net and gross values. Relative price distribution has another peak around 1.23 which is the Polish VAT level (23%), and it also suggests that non-compliance (i.e. inputting net values) is the dominant outcome (see Figure 16 in the Annex). Further analysis showed that this inaccuracy is present in case of all authorities and purchase types across the years. Consequently, the only improvement possible was to exclude a significant share of the contracts with gross values, hence we only include contracts where the relative price is less than one.[27]

Even though relative price values have a clear upward bias, it does not seem to be significantly different from above threshold contracts (Figure 10). A more nuanced analysis will be discussed in the next section.

FIGURE 10: AVERAGE RELATIVE PRICE (GREATER THAN 0.5 AND LESS THAN 1) AROUND THE EU THRESHOLD (2010-2015) – LOCAL AUTHORITIES, SERVICES[28]



[25] However, different countries apply different calculation methods on estimated price (see e.g. Bobilev et al., 2015), that might alter the interpretation of relative price changes (see below).
[26] There is a separate regulation in Poland saying that all 'price' items must be given in gross terms.
[27] Unfortunately, it is only an arbitrary threshold, nevertheless excluding a significant part of contracts with gross final values. We also exclude contracts with the relative price less than 0.5 as the probability of data error is increasingly higher below that value.
[28] Only complier contracts are included in the sample, i.e. contracts published on the TED portal but below the EU threshold and those published only at the national portal but being above the threshold are excluded from the calculations.

Tender outcomes around EU-thresholds

The examples in the previous section suggest that tender outcomes change significantly around the regulatory thresholds. In this section, we investigate the potential effects for each authority and procurement type pairs systematically by comparing tenders below and above the corresponding EU thresholds. We analyse the differences in terms of i) the number of bidders, ii) ratio of single bidder contracts, iii) ratio of foreign suppliers, and iv) relative price.

As it was already mentioned above, assigning the outcome differences to certain regulatory changes is not trivial as there are many factors in play around the EU threshold. Nevertheless, it is still worth to compare the outcomes of just below and above threshold contracts to see whether the contracts affected by strategic bunching are significantly different in any important tender outcomes. Furthermore, tender outcomes close to the EU threshold are compared to the outcomes calculated on the whole universe of below and above threshold tenders. The difference between the outcomes of the smaller subsample and the whole sample can be indicative that not only the regulatory changes, but the buyer's individual – potentially competition restricting – motivations also play a role in contract bunching.

First, the number of valid bids are significantly higher in for supplies procured by local authorities and services procured by central authorities (4.9% and 22.4%) and higher (but not statistically different) in all other categories for above threshold contracts[29]. Furthermore, comparing the outcome difference within close proximity of the threshold vs. all below and above threshold tenders reveals that the increase in the number of bidders is higher around the threshold in case of supply contracts procured by local authorities[30] and service contracts procured by central authorities (see Table 5 vs. Table 6). This suggests that tenders just below the EU threshold are procured in a way which lowers the number of bids submitted. Nevertheless, this finding requires further in-depth work to better understood. Moreover, for public works purchases by local and central authorities we observe higher bidder numbers for TED tenders, but the difference is smaller than for local supplies and services or central supplies which may be due to higher monetary thresholds implying larger firms on either side of the threshold which may not rely on the same publication channels. In addition, there are only a few tenders close to the threshold making the estimation less reliable.

The overall number of submitted valid bids is not necessarily the best proxy of potential competition distortions and tailor-made contracts. Therefore, as it was also suggested by Fazekas et al. (2013), the incidence of contracts with only one submitted bid can be a better proxy to assess the risks of particularistic contract allocation. Similarly to the number of submitted bids, there is a significant decrease in the number of single bidder contracts when following the EU regulations (-13% to -62.5%). Furthermore, the decrease is much higher than the difference observed in the whole sample in case of supplies and services procured by central authorities and supplies procured by local authorities (see Table 5 vs. Table 6).[31] Public works contract are exceptions again, however, this can be due to the insufficient number of observations around the threshold.

As a third indicator of increased competition intensity, we also investigate the ratio of tenders with foreign winner companies. As it was shown, increased transparency can lead to an increased number of non-local players (Coviello & Mariniello, 2014; Lewis-Faupel et al., 2014),

[29] Note, that there is only a few public work contracts around the threshold.
[30] Note, that there are ca. 13 times more contracts procured by local authorities in the whole sample.
[31] The only exception is the public work category, whereas there are too few tenders around the threshold.

that can lower prices or increase quality. Unfortunately, due to the extremely low ratio of contracts won by foreign companies, the change in foreign company winning could not be assessed properly around the threshold. Furthermore, the ratio of foreign winning is low enough (ca. 0.97% for above and 0.37% for below EU threshold tenders) to generate extreme percentage differences in certain procurement types – for example 155% increase in case of supplies procured by local authorities.

Our fourth investigated outcome variable is the relative price. As it was discussed in the previous section, due to particular data errors we use a skewed sample including only those contracts where the relative price is less than 1 and greater than 0.5.[32] Nevertheless, the relative price values have an upward bias for contracts published in the national portal. It is apparent, that relative prices are higher if the contracts follow the EU rules most of the times, the only exception is public works purchasing (Table 6). However, the difference is often smaller or non-existent in the close proximity of the EU-threshold for all categories except public works and local services (Table 5). For example, the relative price is 5.9% higher for above threshold services procured by central authorities on the whole sample, while it is 1.2% lower in the close proximity of the threshold. This suggests that tenders just below the threshold are relatively more expensive compared to the broader sample. Nevertheless, there are several measurement problems related to the estimated value calculation (e.g. is it interpreted as the maximum budget or a market price) that potentially affect these comparisons.

These findings support the idea, that bunching around the threshold is consistent with our third hypothesis. In case of most of the outcome variables, tenders just below the threshold have worse outcomes which supports the idea that bunching is partly about restricting competition. However, it is important to emphasize, that the size of the differences were often modest, and we could not analyse many equally important outcome variables (e.g. quality of implementation etc.)

[32] We also have to assume that excluding contracts with a relative price higher than 1 restricts the sample in a same way in case of both below and above threshold contracts. First, gross final values have to be used randomly in case of the below threshold contracts. Second, the same factors should explain high relative prices for both below and above threshold contracts (i.e. underestimating contract size etc.).

TABLE 5: DIFFERENCES BETWEEN THE CONTRACTS BELOW AND ABOVE EU THRESHOLDS IN THE CLOSE PROXIMITY OF THE REGULATORY CHANGE (DIFFERENCES EXPRESSED IN PERCENT CHANGE COMPARED TO THE TENDERS CONDUCTED ACCORDING TO THE NATIONAL REGULATION)[33]

Contracting authority		Bidder number	Single bidding	Foreign win	Relative price
Local	Supplies	4.9% **	-21.3 % ***	155.5% **	-2.1%
	Services	3.1%	-13% **	-100%	3.7% ***
Central	Supplies	8.9%	-62.5% ***	333%	-3.8% ***
	Services	22.4% ***	-36.6% ***	- 37.5%	-1.2% ***
Local + Central	Work	3.9%	-41.4%	74.6%	0%

In case of bidder number and single bidding, we excluded tenders with outlier values, hence the tenders above the 99th percentile according to submitted bids are not included in the analysis.

There are not enough observations to calculate meaningful ratios of foreign win in case of local services and central supplies. Due to the overall low level of foreign winner companies, the differences between the two groups are high.

As relative price is prone to data error we excluded values below 0.5 and above 1. In lot of cases these are due to unit prices or other data errors.

TABLE 6: DIFFERENCES BETWEEN ALL CONTRACTS BELOW AND ABOVE EU THRESHOLDS (DIFFERENCES EXPRESSED IN PERCENT CHANGE COMPARED TO THE TENDERS CONDUCTED ACCORDING TO THE NATIONAL REGULATION)[34]

Contracting authority		Bidder number	Single bidding	Foreign win	Relative price
Local	Supplies	-3.8% ***	-7.9% ***	154% ***	2.8% ***
	Services	5% ***	-12.2% ***	84.9% ***	3.6% ***
Central	Supplies	-8.9% ***	-13.8% ***	29.8% *	0.9% **
	Services	-10.6% ***	11.1% ***	18.7%	5.9% ***
Local + Central	Work	47.1% ***	-76.3% ***	1935% ***	-8.5% ***

[33] For supplies and services, a +/-5000 EUR, while in case of public works a +/-300000 interval was applied. As the public works threshold is relatively high (ca. 5 million EUR), there are only a few contracts published close to the threshold. Therefore, a relatively wider range of contracts had to be involved. The applied interval was +/-10000 EUR in case of foreign winner ratio comparisons. Only complier contracts are included in the sample, i.e. contracts published on the TED portal but below the EU threshold and those published only at the national portal but being above the threshold are excluded from the calculations.

[34] Only complier contracts are included in the sample, i.e. contracts published on the TED portal but below the EU threshold and those published only at the national portal but being above the threshold are excluded from the calculations.

In case of bidder number and single bidding, we excluded tenders with outlier values, hence the tenders above the 99th percentile according to submitted bids are not included in the analysis.

As relative price is prone to data error we excluded values below 0.5 and above 1. In lot of cases these are due to unit prices or other data errors.

7. Conclusions

Using novel, contract-level public procurement data, this chapter presented a first attempt to shed light on some interesting publication practices, strategic tender designing and its effects in the Polish public procurement market. First, combining national and EU level databases revealed a small but considerable number of potentially non-complying tenders (about 0.6% of all national level tenders), that seemingly do not follow EU regulations neither in terms of practical rules (minimum number of advertisement days) nor in transparency requirements (no EU-level publication) despite falling under the EU regulatory regime due to their characteristics such as contract value and buyer type. The motivation behind these practices is not clear, hence further analysis is to be done.

Second, there is significant manipulation of contract values around the EU regulatory threshold for all relevant contracting authority and product type relations. Third, we found significant strategic contract value manipulation around the EU thresholds in Poland and we show that the tenders affected by manipulation have significantly fewer bidders and a higher rate of single bidding. The difference of these variables in the close proximity of the threshold is higher compared to the difference between all below and above threshold contracts, suggesting that additional market restriction can play a role in manipulating tender values. These can be considered as tentative evidence for strategic bunching around the threshold being partly motivated by restricting competition for corrupt purposes (H3.a) while most certainly simply cutting regulatory costs without corrupt motives also plays a role.

As foreign bidding is relatively rare and prior price estimates can follow different considerations below and above the EU threshold, we have found no consistent differences between tenders below and above EU thresholds. Therefore, it was not possible to dismantle the effect of strategic splitting of contracts around the threshold and the general differences stemming from the EU and national regulations.

Our results are consistent with previous findings, where the manipulation of public procurement tenders below the regulatory thresholds are found to be connected to the exploitation of the more flexible rules. Nevertheless, several further questions emerge from our analysis. First, it is important to understand how and why non-compliance can take place and whether it is about circumventing the applicable regulations or not. While bidding outcomes and relative prices can be indicative of the actual procurement outcomes, it is important to analyse these differences in more depth (e.g. according to markets). Furthermore, the actual detrimental effect of the seemingly less intense competition below the EU threshold could be only verified by analysing actual implementation outcomes. However, as there is no centrally held public documentation on contract implementation performance, our assessment can only rely on indirect measures focusing on the advertisement and award phases.

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9. Annex
Identifying central authorities

A two-step procedure was followed to identify central contracting authorities based on the 2014/24/EU Directive Annex I (96 central authorities are listed in case of Poland). First, we used a simple 'one-way' exact matching method to match authorities listed in the EU Directive's Annex to the both the national and above threshold (TED) database. The matching was only accepted as valid if the authority's name as listed in the Directives were fully contained in the name contained in the datasets (Matching method 1). Hence both the matches like example 1 and example 2 in Table 7 are paired. Second, as there are other possible common mistakes an approximate matching was also applied (Matching method 2), using the so called Levenshtein distance. There can be typos or different spelling in the name of the buyer and the buyer name is shorter than the name listed in the Directive – see the lack of abbreviation in the database name at the end in example 3 or the case change of the initial letter in example 4. In practice, we took the remaining authority names (those that could not be matched by the first method) and we allowed for a 4 character difference between the official list and the published buyer names – i.e. where maximum 4 characters have to be deleted, changed or added to get the official name. This 4 character limit was increased to 9 characters, as that was the string distance where the first clear mistaken pairings occurred. Furthermore, we also dropped gradually those buyer names at each stage that could be matched – i.e. we assumed that the closest match of a particular buyer name is the correct match. Using this method resulted only around 20-25 buyers without any matching public tender both for below and above threshold tenders.

TABLE 7: MATCHING METHOD EXAMPLES

Matching method	Example number	Buyer name in the Directive	Buyer name in the database
1	1	Ministerstwo Infrastruktury	Ministerstwo Infrastruktury
1	2	Generalna Dyrekcja Dróg Krajowych i Autostrad	Generalna Dyrekcja Dróg Krajowych i Autostrad Oddział w Poznaniu
2	3	Kancelaria Senatu RP	Kancelaria Senatu
2	4	Instytut Pamięci Narodowej — Komisja Ścigania Zbrodni Przeciwko Narodowi Polskiemu	Instytut Pamięci Narodowej - Komisja Ścigania Zbrodni przeciwko Narodowi Polskiemu

Additional tables and graphs

TABLE 8: EU THRESHOLD LEVELS IN EUR

Years	Supplies and services		Works
	Local authorities	Central authorities	Local + Central authorities
2010-2011	193000	125000	4845000
2012-2013	200000	130000	5000000
2014-2015	207000	134000	5186000

TABLE 9: NUMBER OF CONTRACTS BY CONTRACTING AUTHORITY AND EU THRESHOLD

Authority type	National database	TED	Sum
Central government	**89,479**	**17,830**	**107,309**
Central government	29,964		
Territorial government	59,515	7,944	
Local government	**689,912**	**21,959**	711,871
Local government	689,912	21,959	
Body governed by public law	**646,324**	**227,066**	**873,390**
Body governed by public law	111,989		
Public health institution	388,652		
Public university	145,683		
Water, energy, transportation and telecom		**29,607**	**29,607**
Research institute	5,333		
Military unit	13,964		
EU institutions		85	
Other	**394,899**	**160,300**	**555,199**
Missing	**151,955**	**1,521**	**153,476**
Sum	**1,991,866**	**458,368**	**2,450,234**

Note: above EU threshold tenders were restructured according to the polish categories; polish categories were simplified and aggregated by the authors)[35]

* In TED, there are two categories: national or federal and regional or local agencies/offices

[35] There is no national level regulation for the utilities related contracts.

FIGURE 11: NUMBER OF TENDERS AROUND THE THRESHOLD PUBLISHED AT THE NATIONAL PUBLIC PROCUREMENT PORTAL– LOCAL CONTRACTING AUTHORITIES, SUPPLIES AND SERVICES (2010-2011, CASES WHERE ESTIMATED VALUE WAS AVAILABLE; N= 7814)

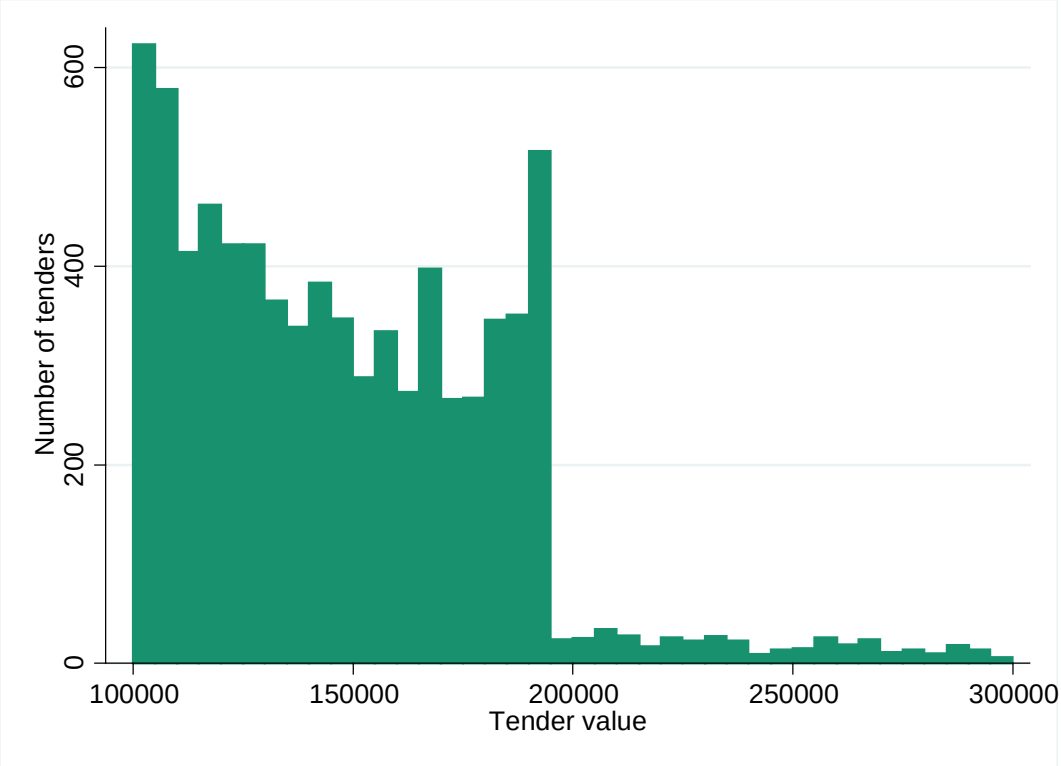

FIGURE 12: NUMBER OF TENDERS AROUND THE THRESHOLD PUBLISHED AT THE NATIONAL PUBLIC PROCUREMENT PORTAL– BODIES GOVERNED BY PUBLIC LAW, SUPPLIES AND SERVICES (2010-2011, CASES WHERE ESTIMATED VALUE WAS AVAILABLE; N= 1510)

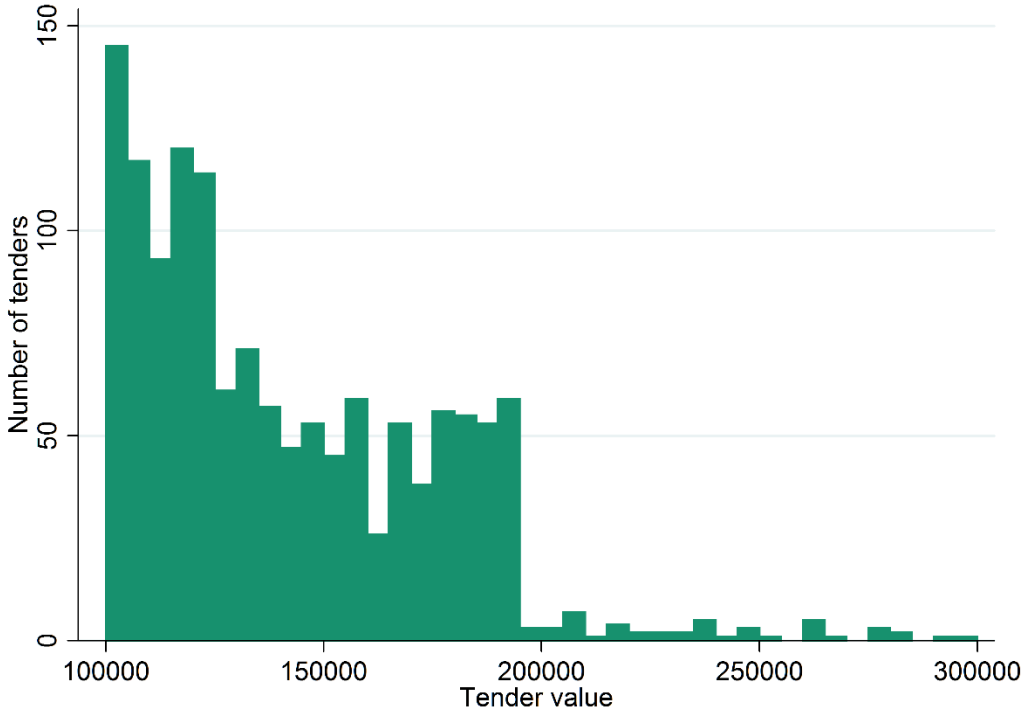

FIGURE 13: NUMBER OF TENDERS AROUND THE THRESHOLD PUBLISHED AT THE NATIONAL PUBLIC PROCUREMENT PORTAL – UNIVERSITIES, SUPPLIES AND SERVICES (2010-2011, CASES WHERE ESTIMATED VALUE WAS AVAILABLE; N= 1242)

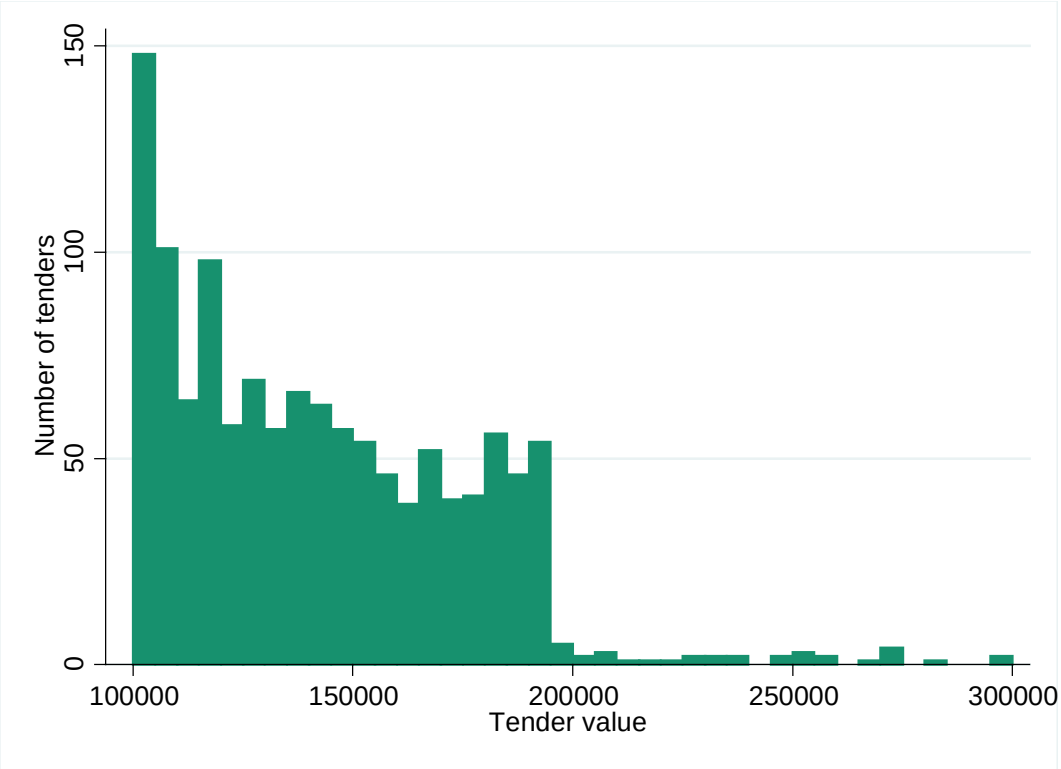

FIGURE 14: NUMBER OF TENDERS AROUND THE THRESHOLD PUBLISHED AT THE TED PORTAL – BODIES GOVERNED BY PUBLIC LAW (2009-2015, CASES WHERE ESTIMATED VALUE WAS AVAILABLE; N= 32348)

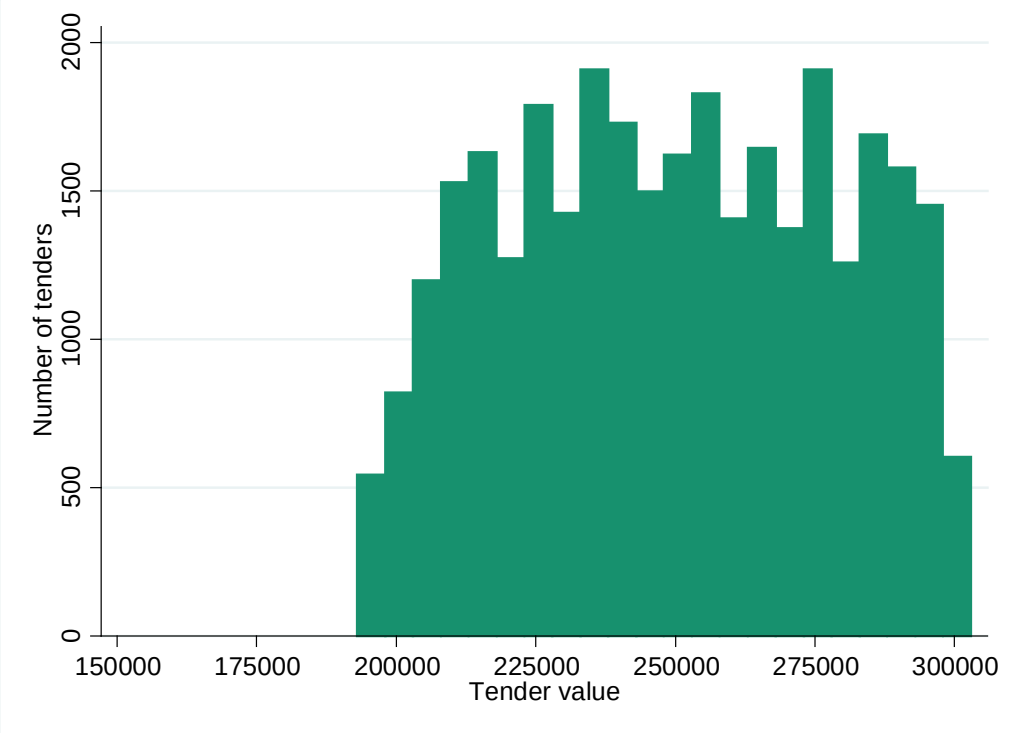

FIGURE 15: NUMBER OF TENDERS (WITH NON-COMPLIANCE) AROUND THE EU THRESHOLD (2010-2015) – SERVICES, LOCAL GOVERNMENTS

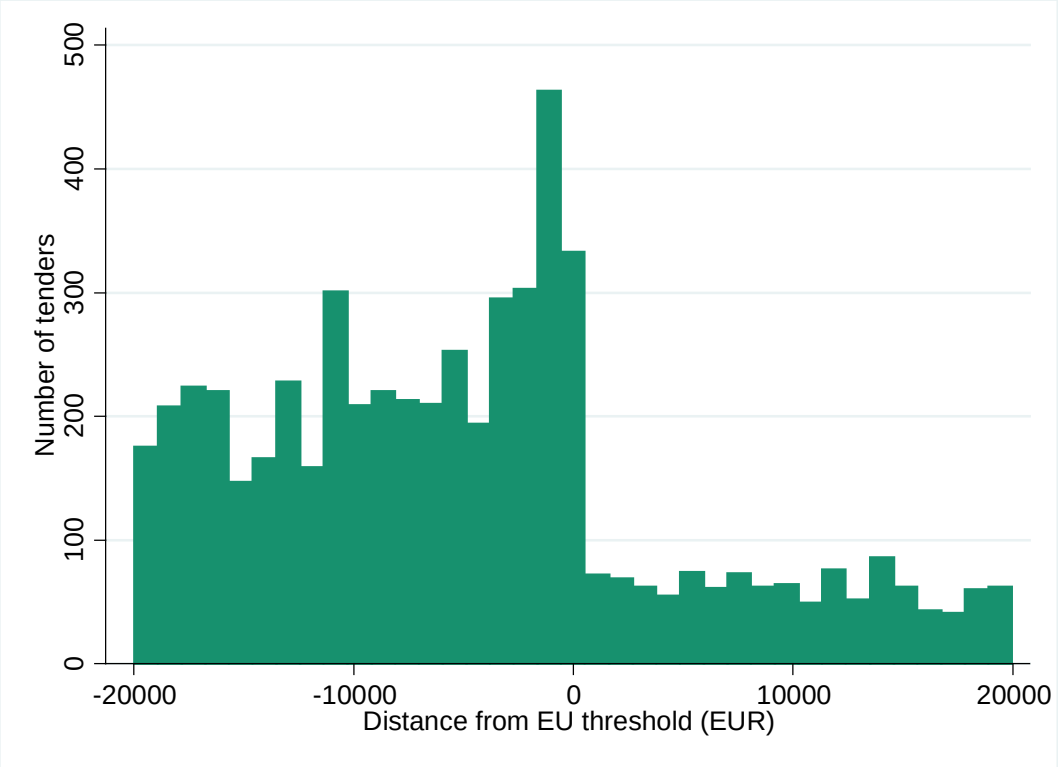

FIGURE 16: DISTRIBUTION OF RELATIVE PRICES IN CASE OF BELOW AND ABOVE EU-THRESHOLD TENDERS