



CORRUPTION
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Analysing corruption as black holes – a study on Hungarian public procurement

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14:30 CHAR 15/023
Brussels

CRCB

- Non-profit, non-partisan organisation
- From 2013
- recent main topics:
 - Corruption risk and competition – Zagreb Holding and the City of Zagreb
 - Media analysis (content analysis & discourse analysis)
 - Big data & data scraping, database building
 - Quality of legislation with hard data
 - Corruption risks & price distortion & competition in EU 2006-2015 – using public tender data

Staff & Support

- Interdisciplinary team
- Voluntary workers
(coders, experts, research assistants etc.)
- IT: 3gteam Ltd.
- Financial support: NGOs, EU Commission;
Hungarian Competition Authority; OSI; World
Bank, governments;
Hungarian companies and private donations.

MAIN MESSAGES

2021.11.23.



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In the period of 2009-2016 the Hungarian public tenders are characterised by

- Decreasing intensity of competition
- Growing level of corruption risks
- Strengthening of price distortion (overpricing)
- In 2016 the results pointed out some positive tendencies

- The weight of estimated direct social loss (EDSL) due to corruption and low level intensity of competition is
 - cca. 10-17% of total contract value and exceeded at least 1,800-2,300 billion HUF (5.8-7.5 billion Euros) in the whole period of 2009-16

- The EU funding has perverse effects in Hungary
 - reduces intensity of competition
 - increases corruption risk and
 - increases the weight of price distortion
 - fuels the building of political favoritism (& kleptocratic state)

MOTIVATIONS

2021.11.23.

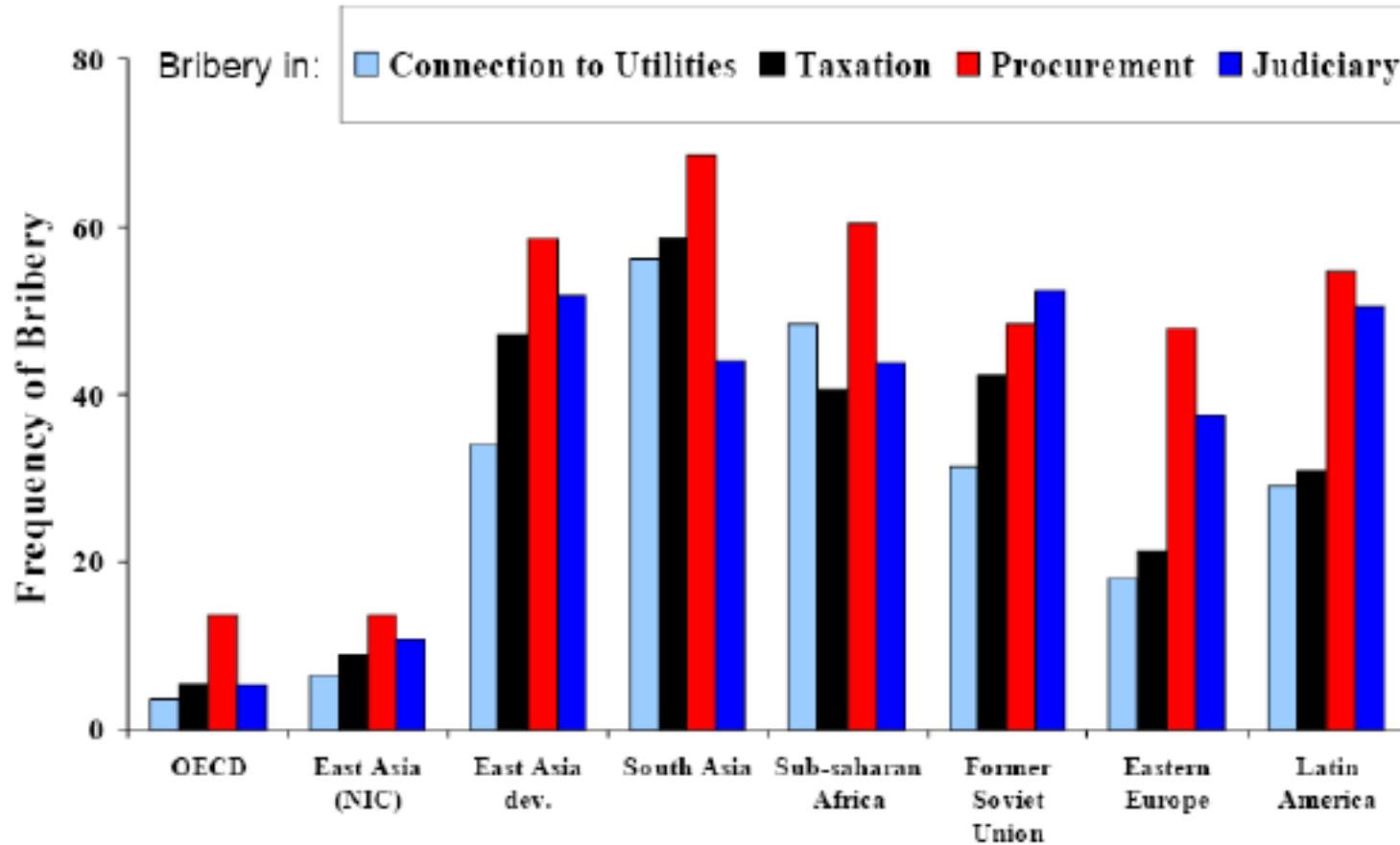


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Public Procurement

- One of the most important fields of *grand corruption*

Fields of Corruption



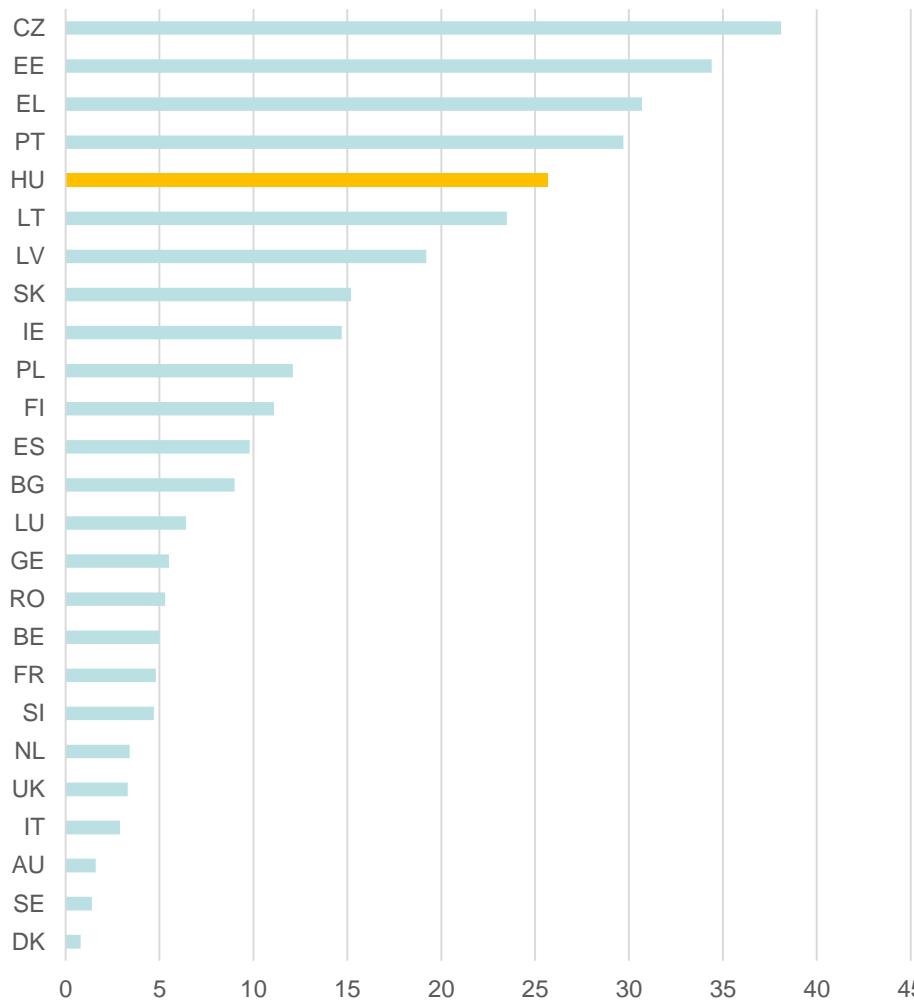
Source: OECD, data from an expert survey

Public Procurement

- One of the most important fields of *grand corruption*
- In Hungary 15-20% of GDP
- cca. 15-20 Billion Euros per year

Share of EU funded PP in total number of PP in European countries, 2009-13, N = 1,777,955

Hungary is one
of the biggest
beneficiary
countries in
the EU



Source: CRCB
calculation by
[TED](#)

Public procurement & corruption

- General problems in Hungary
 - Weak e-procurement system
 - Lack of downloadable PP database
 - no e-bidding (high prob. of collusion and restriction of competition)
 - The share of tenders without announcement is extremely high

Public Procurement

- Anecdotic evidences:
- the amount of direct social loss is very high
- A lot of suspicious (corrupt?) cases

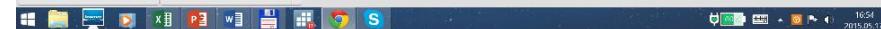
Three Nice Hungarian Cases

Viewpoint

Disabled Access Lift



Empty database
(Employee Tracking
Survey)



2021.11.23.

Three Nice Hungarian Cases

Viewpoint: cca. 130,000 euros



Three Nice Hungarian Cases

Disabled Access Lift: 5,200 euros



Three Nice Hungarian Cases

Empty database:

(Employee Tracking Survey): cca. 800,000 euros

The screenshot shows a web browser window with multiple tabs open. The active tab displays the 'Pályakövetési rendszer' (Employee Tracking System) homepage. The page features a red header with the system's name and a small Hungarian flag. On the left, there is a sidebar with links: 'Bemutatkozás', 'Pályakövetésről', 'Hírek', 'Elérhetőség', 'Aktuális statisztikák', and 'Kezdőlap'. The main content area contains a large graphic of silhouettes of people in professional attire, with one person pointing upwards. Below this graphic, there is text in blue script: 'TÁMOP 2.2.1 A képzés evolúciója'. At the bottom of the page, there are logos for 'Új Magyarország', the European Union, and 'Nemzeti Fejlesztési Ügynökség' (NFÜ), along with contact information: 'UMFT infonr.: 06 40 638 638' and 'nfu@meh.hu • www.nfu.hu'. The browser's address bar shows the URL: <https://palyakovetes.nive.hu/pkr/#bcmutatkozas>.

The screenshot shows a Windows desktop environment. In the foreground, there are two overlapping windows from a file explorer application. The left window is titled 'pics4.jpg' and the right window is titled 'pics3.jpg'. Both windows show a list of files. The taskbar at the bottom of the screen displays several pinned icons, including Microsoft Edge, File Explorer, and other productivity tools. The date and time on the taskbar indicate it is 16:54 on May 17, 2015. A status bar at the bottom of the screen also shows the date and time.

EU funds & corruption

1. Big data / objective indicators help

EU policy that aims to have more effectively targeted cohesion funds,
detect corruption risks, fight against corrupt behaviour
avoid social losses
build a better system for analysing PP at contract level

2. How do EU funds effect on

intensity of competition
corruption risks
price distortion (overpricing)

3. Analysis of corrupt systems

(Political favouritism & kleptocratic state)

Corruption... as... a black hole

Without measurement, it is not worth talking about

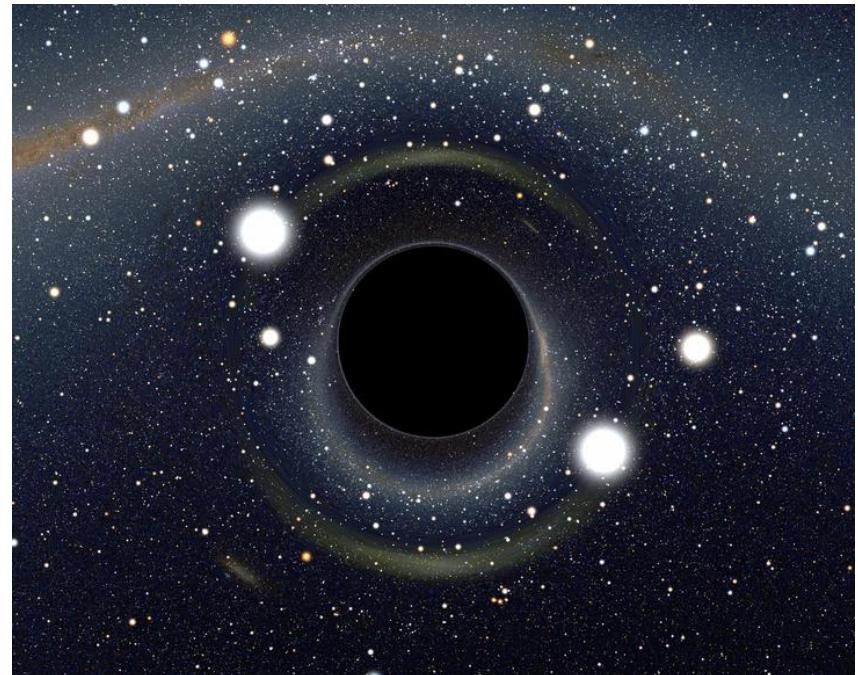
Black hole: not visible but measurable

- weight
- radius
- temperature
- distance

We are in the same way with corruption

Corruption could be analogous to the black hole

- Not observable, but
- We can estimate its prevalence
- Where does it happen?
- How much social loss does corruption generate?



CONCEPTS & INDICATORS

Corruption & Competition



Corruption & Competition

- Micro level phenomenon
- A transaction between two or several economic players
- Hidden in both side (seller and purchaser)
- A sign of the lack of integrity in an institution / institutions or in a whole institutional system

Corruption & Competition

condition of corruption

=> corrupt transaction

=> outcomes of a corrupt act

Operationalized concepts:

corruption risk

contract price distortion

irregularities in winning odds (i.e. cartel, bid rigging)

Corruption & Competition

- Micro phenomenon
- From weak competition to strong competition
- Not hidden
- The strength of competition is measurable at transaction level

Corruption & Competition

Operationalized concepts:

- intensity of competition
- Competitive pressure (markups)

Operationalized concepts

corruption

corruption risk

contract price distortion

competition

intensity of competition

Analysed information / variables

1. Date of publication
2. Type of procedure
3. Net contract value (the price of the winner)
4. Estimated value
5. Common procurement vocabulary (cpv) code
6. Number of bids

Indicators:

Contract price distortion

1. Rounded contract price (ROUND1) [0,1], dummy variable. Its value is 1, if the net contract value is rounded; and 0, else;
2. Rounded contract price (ROUND2); its value is 1, if the net contract value is rounded by 10^2 ; and 0, else;
3. Rounded contract price (ROUND3); its value is 1, if the net contract value is rounded by 10^3 ; and 0, else
4. Relative weight of rounding (ROUNDR2); the winner price includes what degree of rounding [0.25, 0.5, 0.75, 1], ordered variable; (i.e. in case of „1,001,000”, ROUNDR2 = 0.5)

$$ROUNDR = \frac{R_{obs}}{R_{max}}$$

5. BENFORD1: the first digit test of net contract price, categorical variable;

Indicators:

Corruption risks

1. Transparency index (TI) [0,1], dummy variable;

The value of 0 means the tender was issued without announcement;

the value of 1 means the tender was issued with announcement.

2. Single bidder (SB); [0,1], dummy variable;

3. Indicator of corruption risk (CR2) with two components (TI and SB) [0, 0.5, 1]; ordered variable;

The value of 0 means low corruption risk (more than one bidder and tender with announcement), the value of 1 means high corruption risk (tender without competition and without announcement)

4. Indicator of corruption risk (CR3) with three components

(TI, SB, and ROUNDD) [0, 0.33, 0.66, 1];
ordered variable;

Indicators:

Intensity of competition

1. ICI: Index of Competition Intensity $[0.301 \leq ICI \leq 1]$;
measures the intensity of competition:
low value means low intensity,
high value means high intensity;

nbid: the number of bidders in a tender

$$ICI = \log(nbid)$$

in case where $2 \leq nbid \leq 10$,

$ICI = 1$, if $nbid > 10$, and

if $x = 1$, $ICI = \text{missing value}$

Indicators:

Intensity of competition

2. RPRD: the magnitude of price drop of the contract price (P) compared to the estimated price (P^*)

$$RPRD = \frac{(P^* - P)}{P} * 100$$

Other indicators:

- NVVALUE: net contract value (contract price);
- NEVALUE: net estimated value;
- CPV codes
- Number of bids (NBID), categorical variable;
- Date of publication
- EU: [0,1], tender funding by EU

Conceptual framework

General concepts	Operationalized concepts or variables	Composite indicators	Elementary indicators
corruption	corruption risks	SB {NBID}	NBID
		CR2 {TI, SB}	TI
		CR3 {TI, SB, ROUND}	
	price distortion	ROUND1 {NCVALUE}	
		ROUND2 {NCVALUE}	
		ROUND3 {NCVALUE}	NCVALUE
		ROUND2 {NCVALUE}	
		BENFORD1 {NCVALUE}	
competition	intensity of competition	RPRD2 {NEVALUE, NCVALUE}	NEVALUE
		ICI {NBID}	NCVALUE
		ICIO {NBID}	NBID

Price distortion

fraud analytics, auditing, forensic accounting:

- First digit test (Benford's law)
- First two digit test (Benford's law)
- Last two digit test (rounding data test)
- Recurring data test
- Summation test

Benford's Law

A set of numbers is said to satisfy Benford's law if the leading digit d ($d \in \{1, \dots, 9\}$) occurs with probability:

$$P(d) = \log_{10}(d+1) - \log_{10}(d) = \log_{10}\left(\frac{d+1}{d}\right) = \log_{10}\left(1 + \frac{1}{d}\right).$$

Measurement of price distortion by Mean Squared Error (MSE):

$$MSE = \frac{1}{n} \sum_{i=1}^n (\hat{Y}_i - Y)^2$$

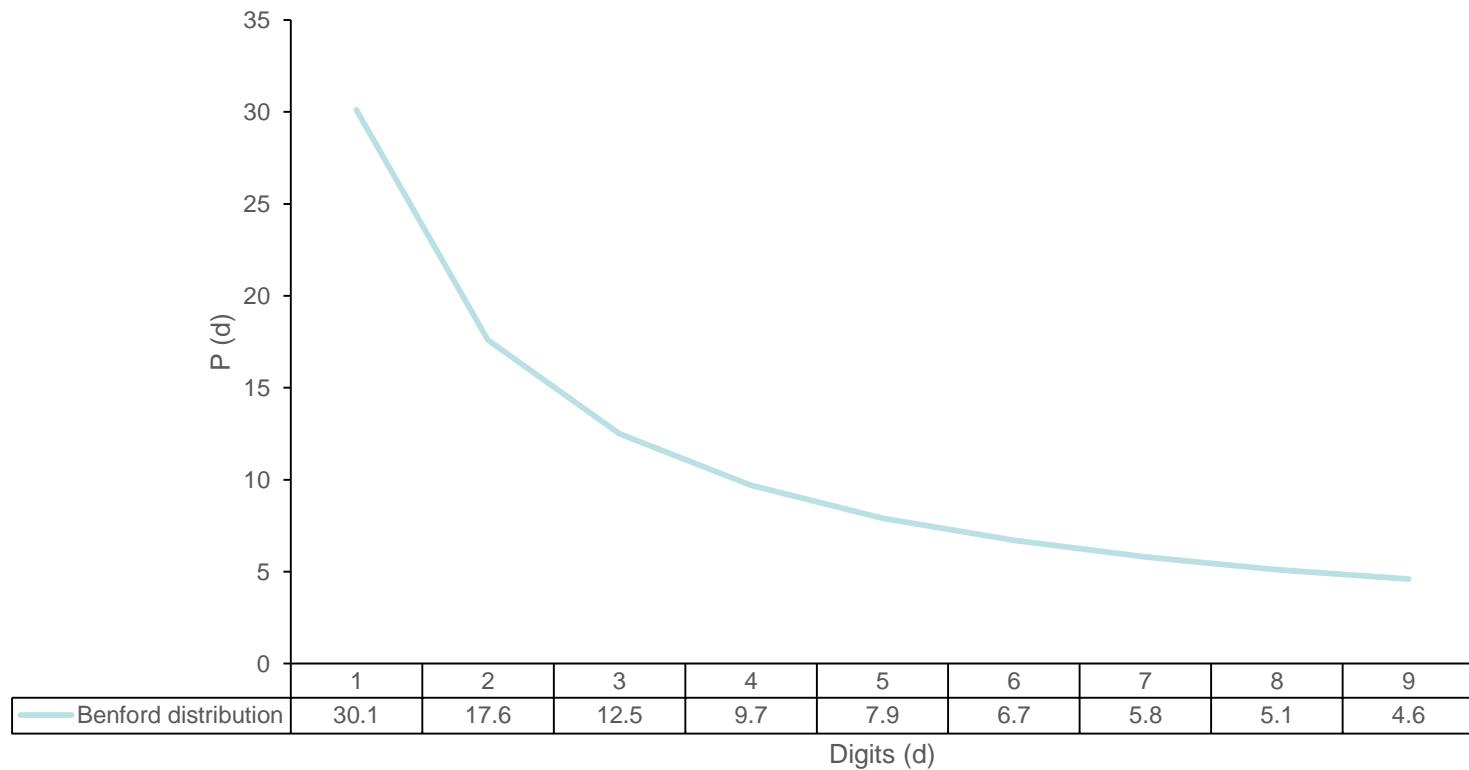
where \hat{Y} is the predicted value and Y is the observed value in percentages.

Benford's Law

digits	log(d)	log(d+1)	$P(d) = \log(d+1) - \log(d)$	cum [P(d)]
1	0.000	0.301	0.301	0.301
2	0.301	0.477	0.176	0.477
3	0.477	0.602	0.125	0.602
4	0.602	0.699	0.097	0.699
5	0.699	0.778	0.079	0.778
6	0.778	0.845	0.067	0.845
7	0.845	0.903	0.058	0.903
8	0.903	0.954	0.051	0.954
9	0.954	1.000	0.046	1.000

Benford's Law

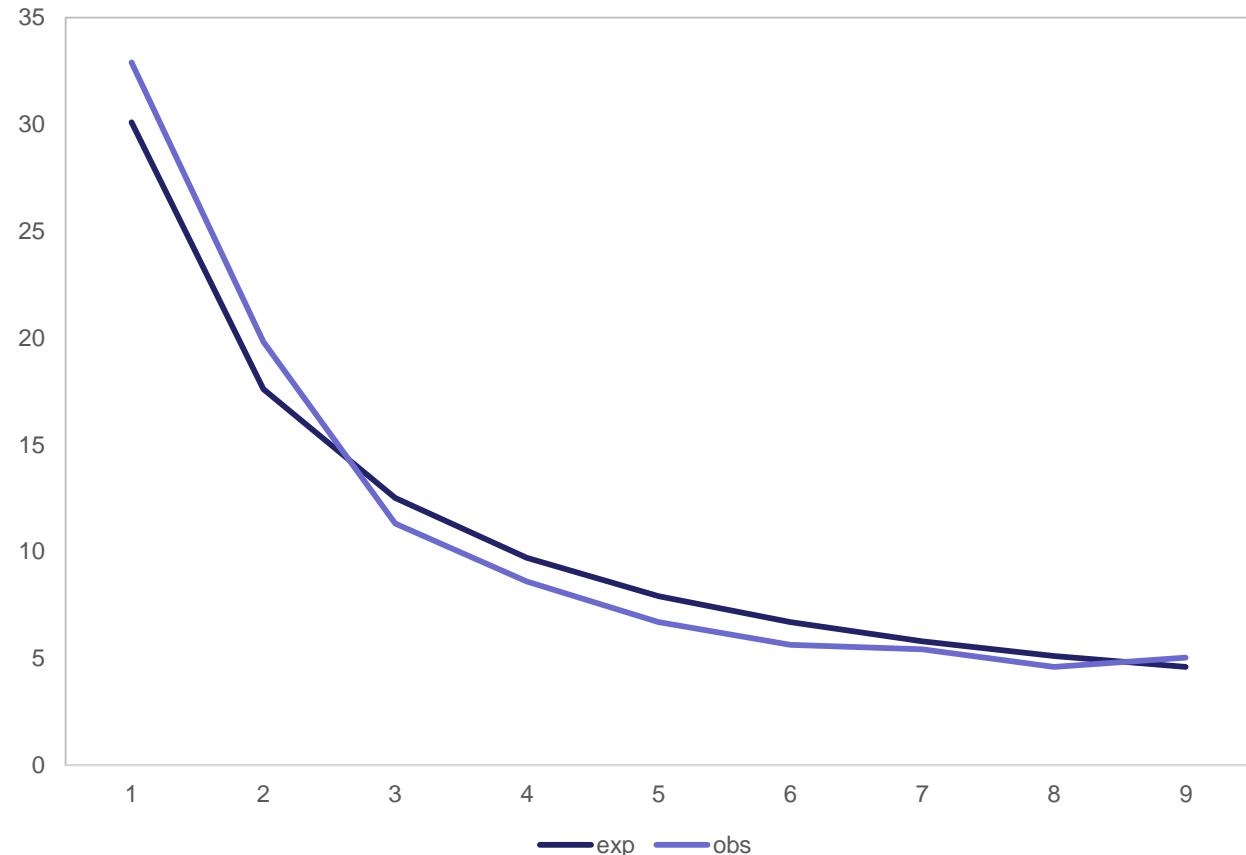
The distribution of first digits, according to Benford's law



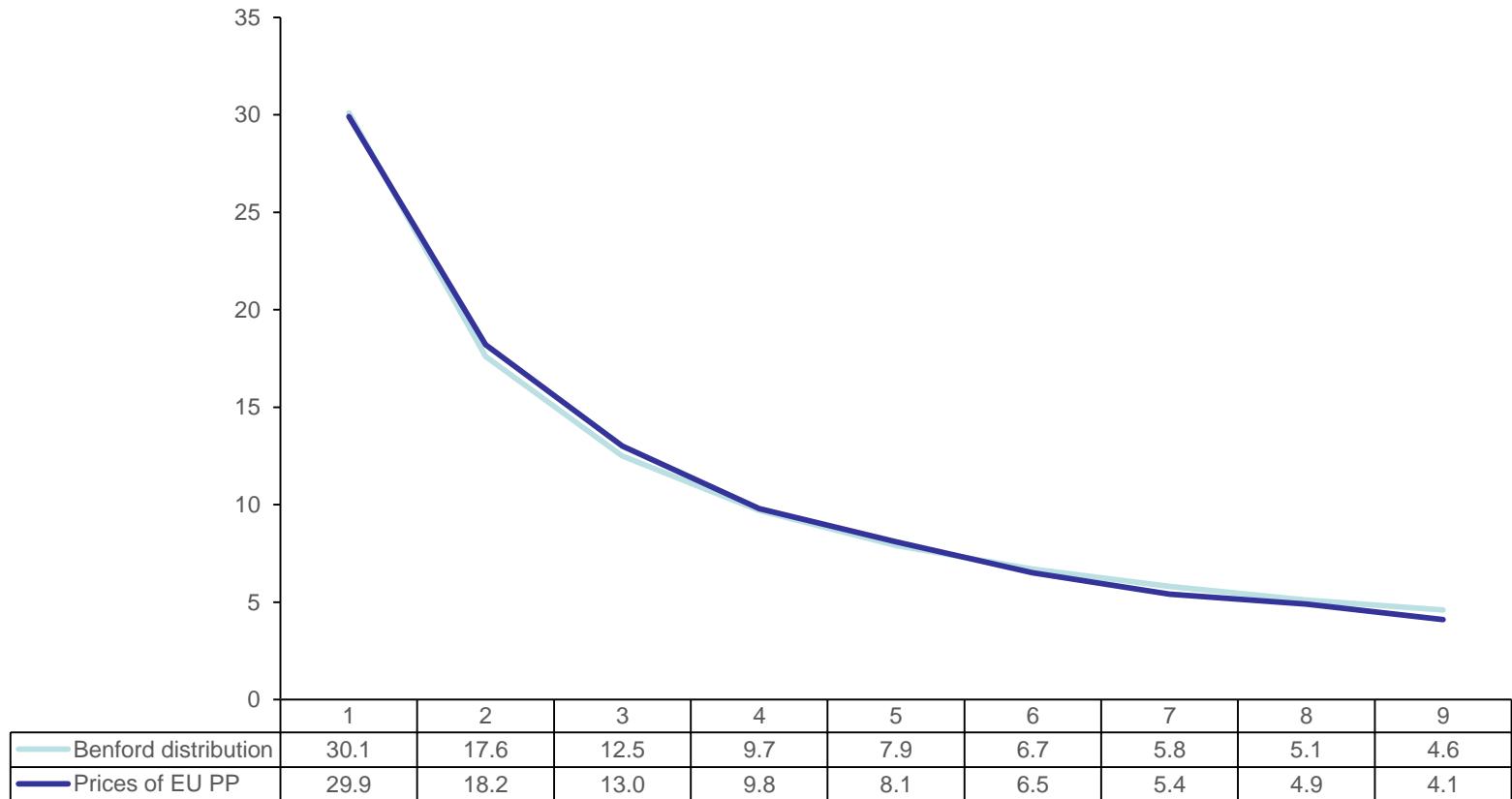
Expected and observed distribution by 1st digits in HPP, 2009-16, N = 138,743

PP in Hungary; whole sample:

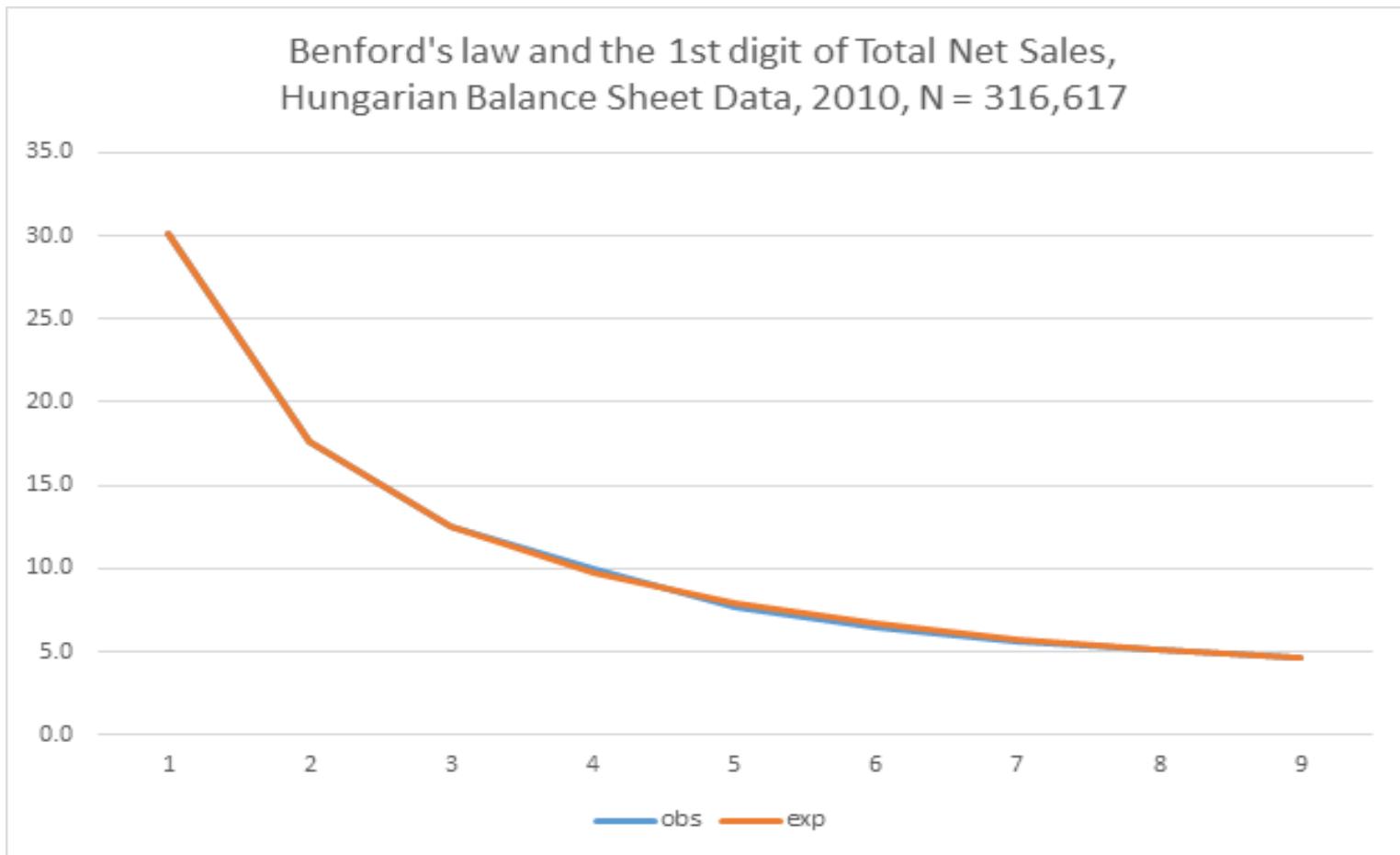
The Hungarian data fit quite well into the expected distribution



Expected and observed distribution by 1st digits of net contract price in EU PP, 2009-13, N = 1,633,114



Expected and observed distribution by 1st digits: Total Net Sales of the Hungarian companies, 2010, $N = 316,617$



Benford's law: applications

- Analysis of predictive models in economics [Hal Varian, 1972]
- Fraud detection in sociological research [Dieckman, 2007]
- Administrative surveys, census, USA [Nigrini, 2015]
- Fraud detection at clinical research, USA [Lee et al., 2015]
- Analysis of fraud at elections, Iran [Roukema, 2015]
- Detection of tax evasion, USA [Nigrini, 1992]
- Detection of fraud, embezzlement at companies, USA [Nigrini, 2012]
- **Detection of price distortion and corruption at public tenders [CRCB, 2016]**

DATA



Data

- Hungarian data: contract level data, 2009-2016;
- Original/official data (unstructured, dirty) with typos, missing data, etc.: (<http://www.kozbeszerzes.hu/>)
- cleaning and database building
- Cleaned and structured data:
MaKAB (N= 176,886)
(<http://tendertracking.eu/>);
- Database building was partially supported by the EU 7th Framework,
(Anticorrp project).
- European data, contract level data, 2006-15: [TED](#) (N= 4,297,950)

From this...

kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_3715_2007/

KÖZBESZERZÉSI HATÓSÁG ENGLISH Belépés / Regisztráció
Jelzés-elmélező

HATÓSÁG JOGORVOSLAT JOGI HÁTTÉR TEVÉKENYSÉGEK KAPCSOLATOK

Címlap

Közbeszerzési Értesítő száma: 2007/35
 Beszerzés tárgya: Építési beruházás; Tervezés és kivitelezés; (Az 1-27. szolgáltatási kategóriákat lásd a Kbt. 3. és 4. mellékletében)
 Hirdetmény típusa: Tájékoztató az eljárás eredményéről (2-es minta) KE
 Eljárás fajtaja: Meghívásos
 Közzététel dátuma: 2007.03.26.
 Iktatósáma: 3715/2007
 CPV Kód: 45.22.00.00-5; 45.22.21.10-3; 45.22.21.00-0; 45.11.12.00.0; 45.23.31.20-6; 74.23.20.00-4; 74.22.40.00-5;
 74.23.21.00-5
 Ajánlatkérő: Szabolcs-Szatmár-Bereg Megyei Szilárdhulladék-gazdálkodási Társulás
 Teljesítés helye: Nyíregyháza, Kisvárda, Nagycsed
 Ajánlatététi/részvételi jelentkezési határidő:
 Nyertes ajánlattevő: „Vegyép-szer-KE-Víz 21-Közgép” Konzorcium
 Ajánlatkérő típusa: Regionális/helyi szintű
 Ajánlatkérő fő tevényeségi körje:
 Letöltés: [Hirdetmény letöltése PDF formátumban](#)

Szabolcs-Szatmár-Bereg Megyei Szilárdhulladék-gazdálkodási Társulás tájékoztatója az eljárás eredményéről (3715/2007)

I. SZAKASZ: AJÁNLATKÉRŐ

I.1) NÉV, CÍM ÉS KAPCSOLATTARTÁSI PONT(OK)
 Hivatalos név: Szabolcs-Szatmár-Bereg Megyei Szilárdhulladék-gazdálkodási Társulás
 Postai cím: Hősök tere 5.
 Város/Község: Nyíregyháza
 Postal irányítószám: 4400
 Ország: Magyarország
 Kapcsolattartási pont(ok)
 Címzett: Parragh Dániel
 Telefon: 42/508-351
 Fax: 42/508-366
 E-mail: parragh@ssbcdc.hu
 Internetcím(ek) (adott esetben)
 Az ajánlatkérő általános címe (URL): -
 A felhasználói oldal címe (URL): -

I.2) AZ AJÁNLATKÉRŐ TÍPUSA
 Központi szintű: -
 Közjogi szervezet: -
 Regionális/helyi szintű: X
 Egyéb: -

I.3) AZ AJÁNLATKÉRŐ MÁS AJÁNLATKÉRŐK NEVÉBEN FOLYTATJA-E LE A KÖZBESZERZÉSI ELJÁRÁST?

1:49 AM 3/9/2016

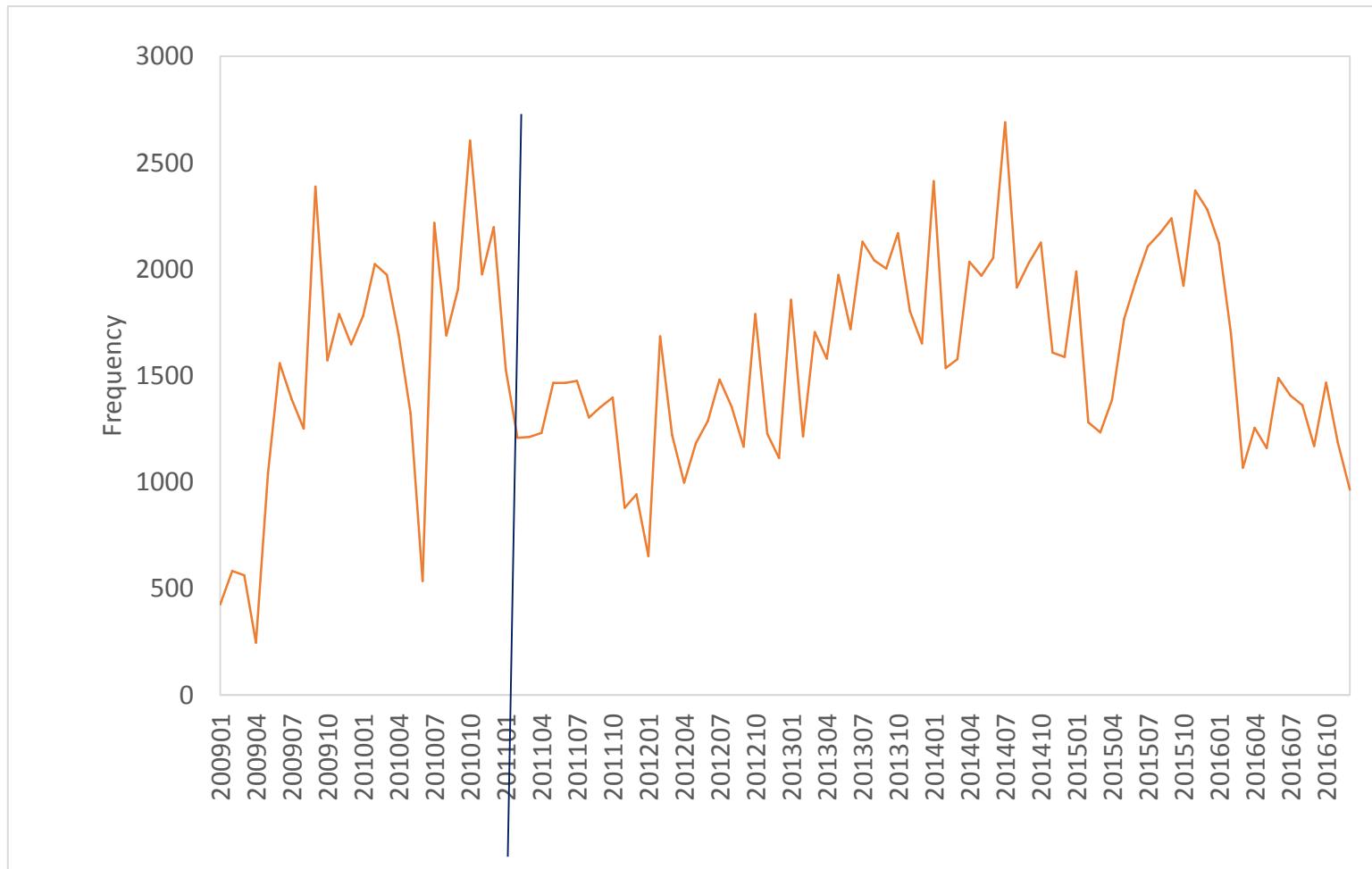
..to this....

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2	209960	12686/2014	2014. évi Kistérségi Startmunka mintaprogram	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_12686_2014	07/02/2014
3	209965	12686/2014	2014. évi Kistérségi Startmunka mintaprogram	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_12686_2014	07/02/2014
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6	445472	18787/2009	projektmenedzsmenti feladatok Abádszalók	http://kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_18787_2009	
7	439077	19363/2009	Ovosi rendelo felújítása	http://kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_19363_2009	
8	25072	20584/2010	Az abádszalói Polgármesteri Hiv.komplex akadálymentesítése és a Hat Szí...	http://kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_20584_2010	
9	25073	20584/2010	Az abádszalói Polgármesteri Hiv.komplex akadálymentesítése és a Hat Szí...	http://kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_20584_2010	
10	243127	23162/2014	2014. évi Kistérségi Startmunka mintaprogram II. elnevezésű projekt megvaló...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_23162_2014	11/05/2014
11	19660	33015/2010	Az abádszalói Polgármesteri Hivatal komplex akadálymentesítése.	http://kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_33015_2010	
12	16864	36186/2010	Az abádszalói Polgármesteri Hivatal komplex akadálymentesítése	http://kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_36186_2010	
13	229498	18675/2015	Kiránduló Központ építése Abáujszántón, a meglévő fürdő épület átalakításá...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_18675_2015	09/30/2015
14	229499	18675/2015	Kiránduló Központ építése Abáujszántón, a meglévő fürdő épület átalakításá...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_18675_2015	09/30/2015
15	11222	18553/2011	Vis maior tartalék felhasználásának keretében, vállalkozási szerződés 2011...	http://kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_18553_2011	
16	242415	22898/2014	Tervezési és kivitelezési szerződés - Abaújvár és Kecskemét között Hernád fol...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_22898_2014	11/17/2014
17	230605	18987/2013	Az abdai Szent József Római Katolikus Templom felújítása	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_18987_2013	11/08/2013
18	211152	13068/2013	Vállalkozási szerződés a KMOP 5.2.1/B/09-2f/2010-0011 azonosító számú L...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_13068_2013	08/02/2013
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20	213914	13904/2013	I. rész Szállítmási szerződés keretében a KMOP-5.2.1/B-09-2f-2010-0011. azo...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_13904_2013	08/19/2013
21	215101	14202/2015	Közszolgáltatási szerződés keretében Abony Város közigazgatási területén ...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_14202_2015	08/05/2015
22	444554	15009/2009	Abony Város Önkormányzata fenntartása alatt működő, 352 m2 alapterülete...	http://kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_15009_2009	
23	224073	16988/2013	Szállítmási szerződés keretében az Abony Város Önkormányzata, Abony Vár...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_16988_2013	10/07/2013
24	225669	17514/2014	Vállalkozási szerződés a Belterületi utcák burkolat-felújítási munkálatai 2014...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_17514_2014	08/29/2014
25	462941	18103/2012	Abony Város Ivóvíz minőség-javítási és ivóvízhálózat rekonstruációs program...	http://kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_18103_2012	
26	229724	1875/2015	Közszolgáltatási szerződés keretében Abony Város közigazgatási területén ...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_1875_2015/	02/06/2015
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28	233884	20081/2014	Abony Város Önkormányzata részére a Belterületi utcák burkolat-felújítási m...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_20081_2014	09/26/2014
29	239032	21639/2015	Feltételes Vállalkozási szerződés	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_21639_2015	11/05/2015
30	243254	23211/2015	Feltételes Vállalkozási szerződés	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_23211_2015	11/11/2015
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32	245454	23945/2014	Közszolgáltatási szerződés keretében Abony Város közigazgatási területén ...	www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_23945_2014	11/26/2014
33	17460	34534/2010	ABONY VÁROS IVÓVÍZMINŐSÉG - JAVÍTÁSI ÉS IVÓVÍZHÁLÓZAT REKON...	http://kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_34534_2010	

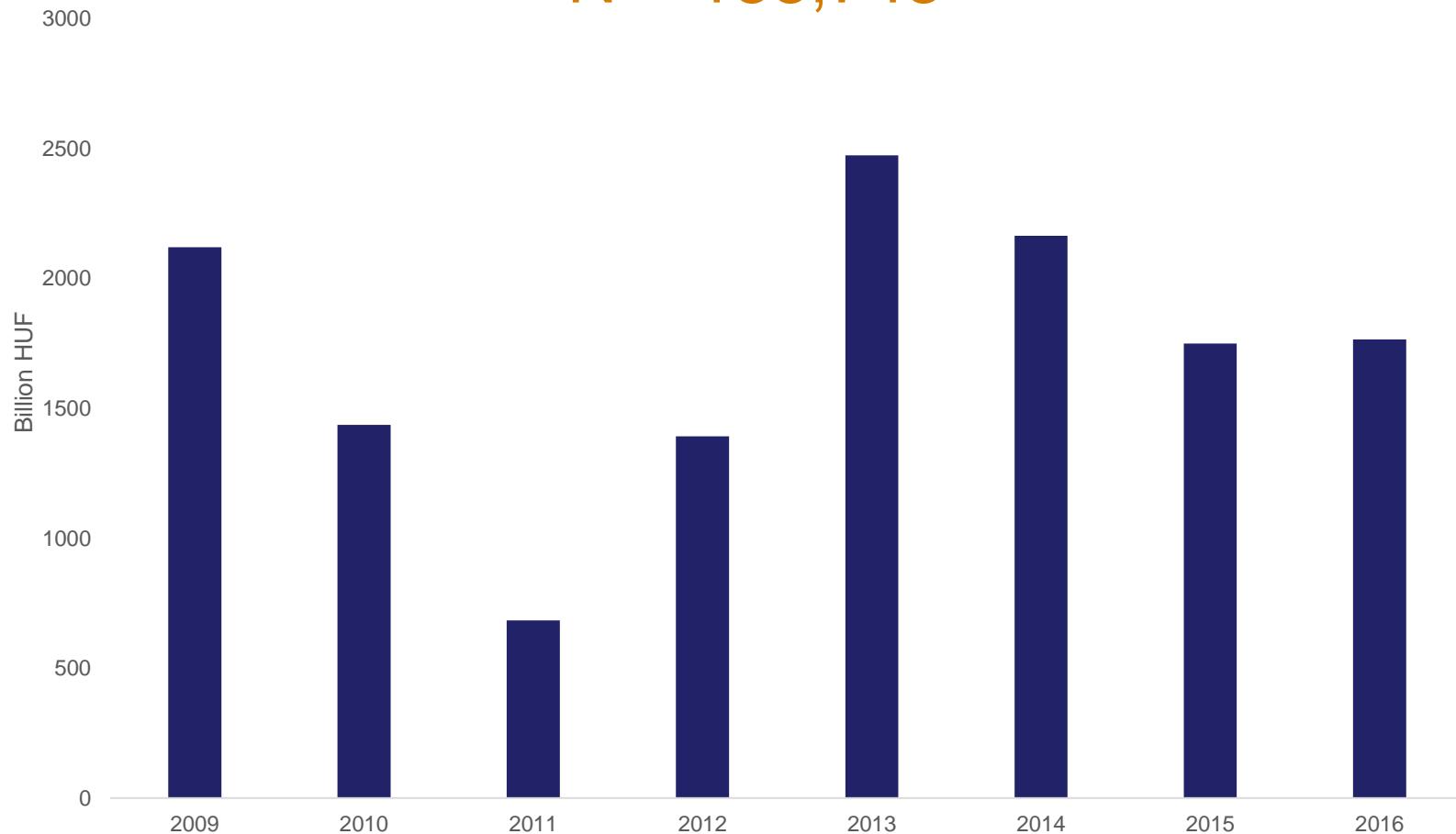
TRENDS



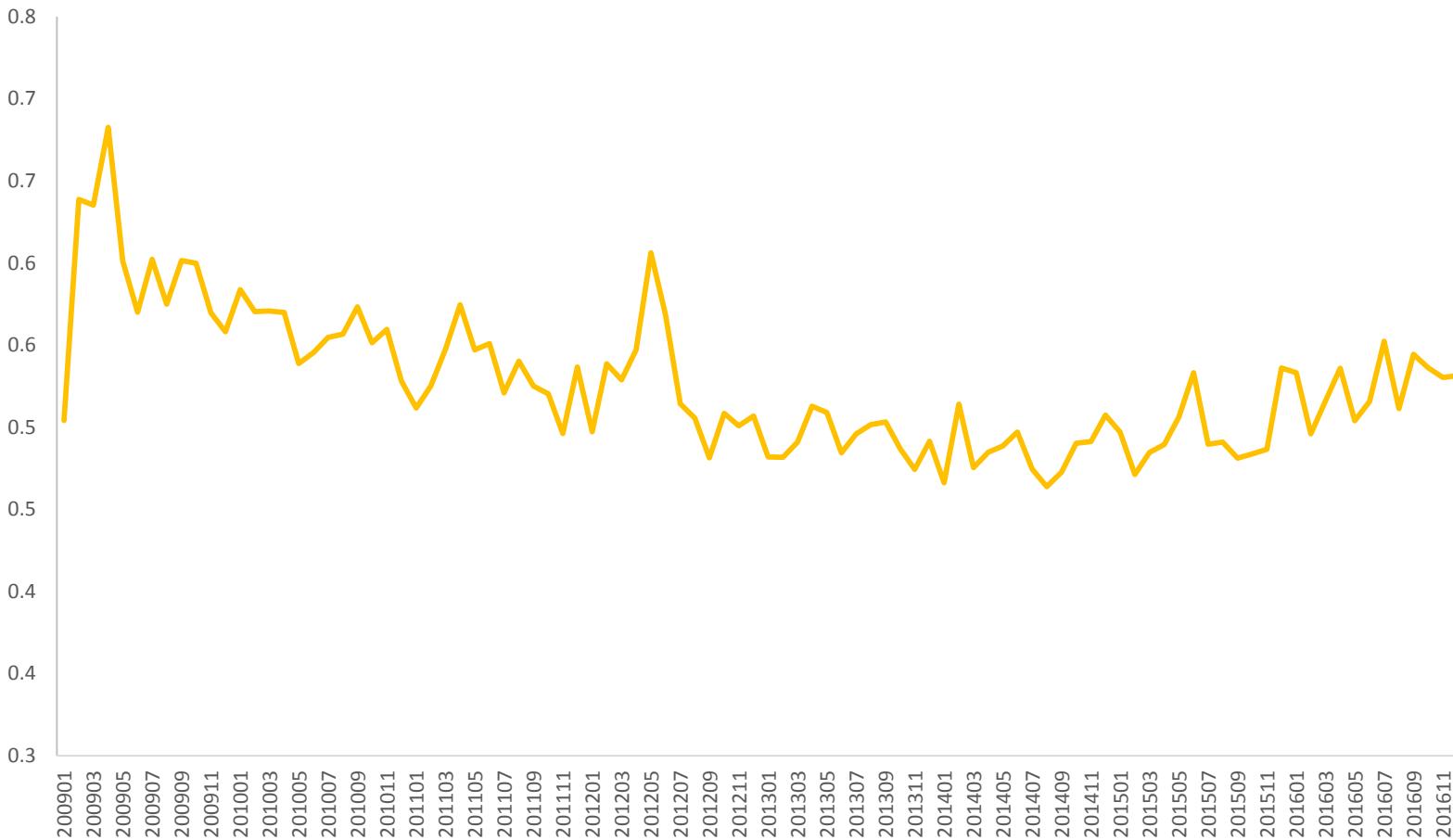
Number of contracts, 2009-2016, N = 151,457



Aggregated net contract value in the Hungarian public procurement per year between 2009 and 2016, N = 138,743



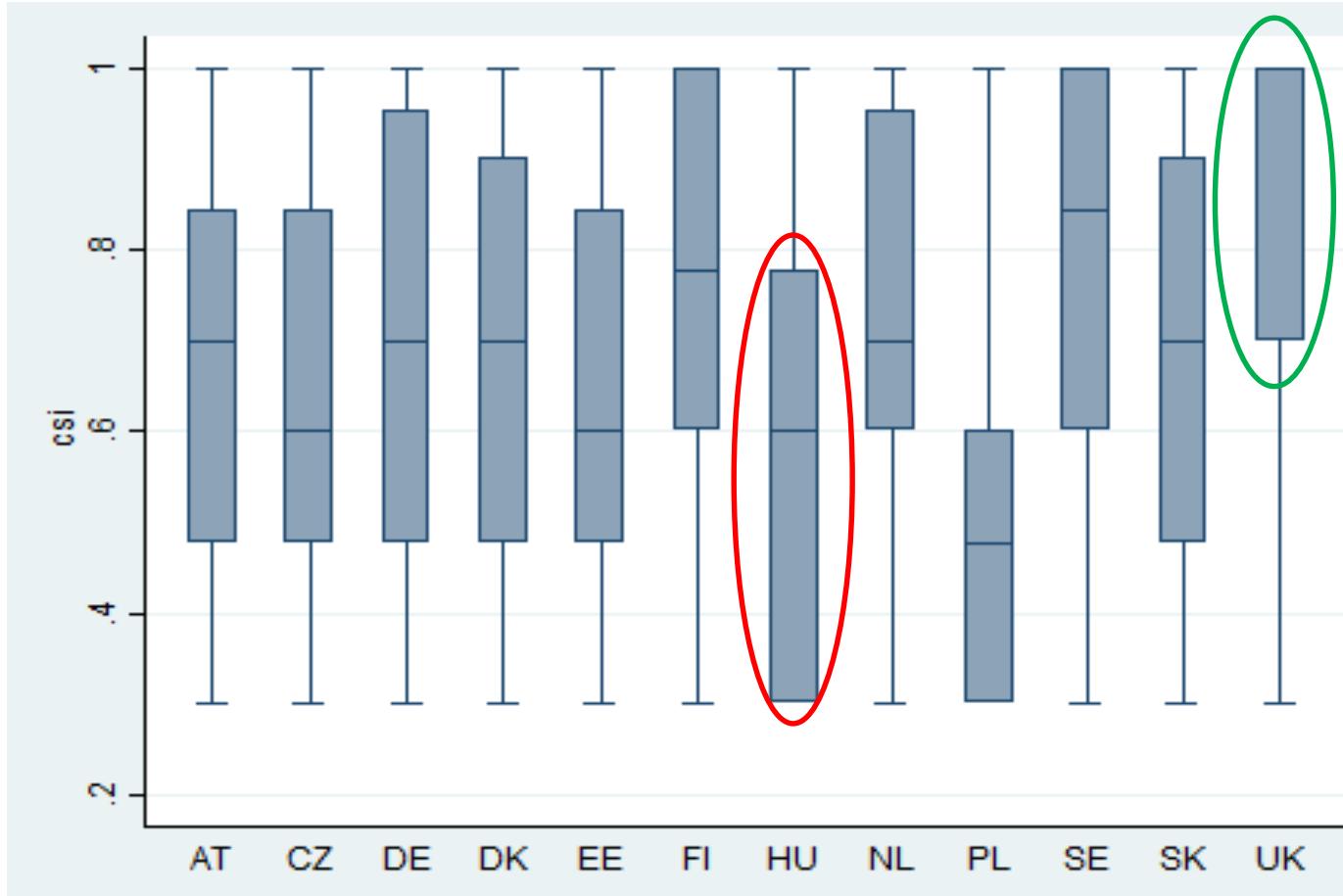
The Index of Competition Intensity in HPP, 2009-2016, N = 108,036



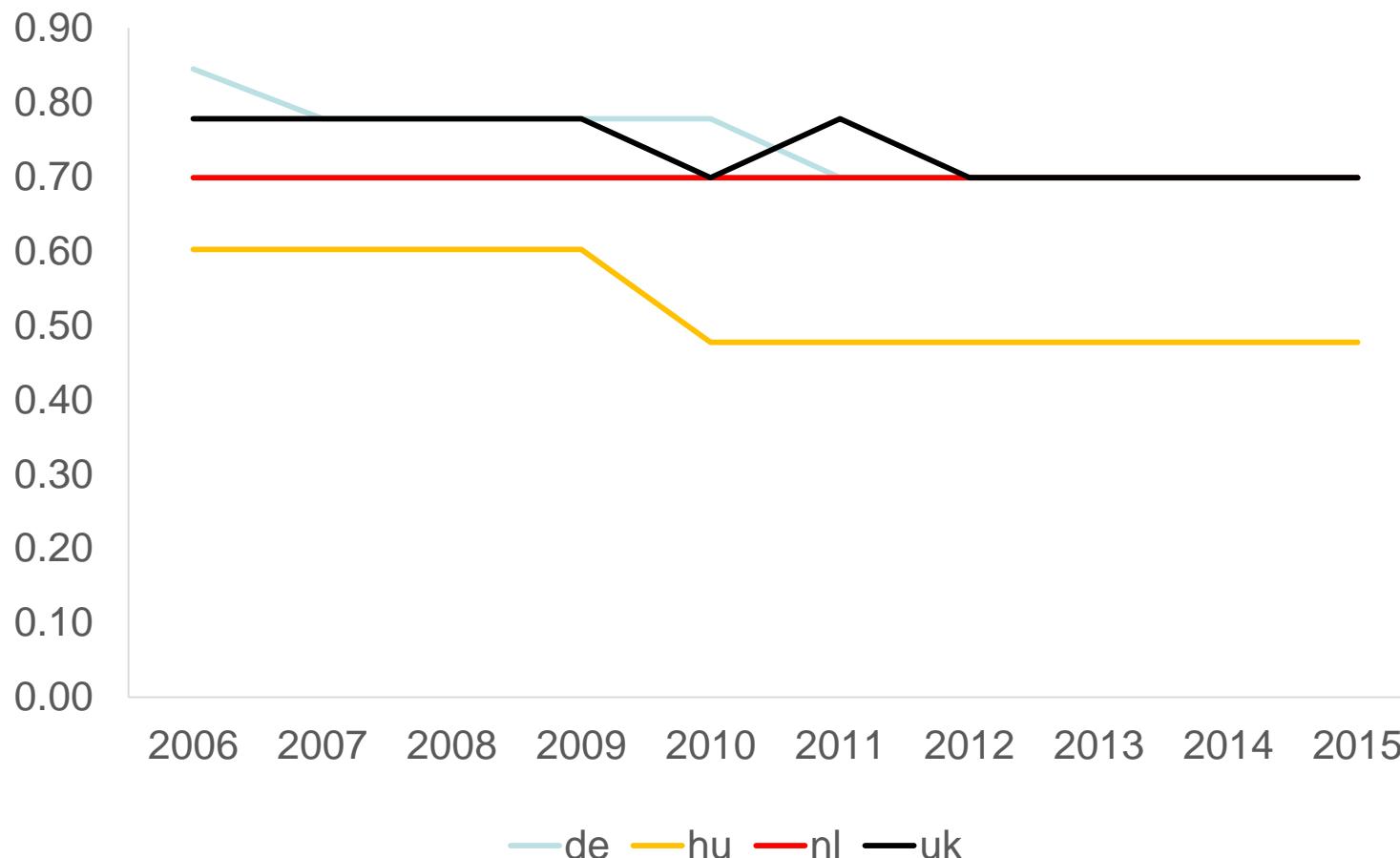
Index of Competition Intensity (ICI) in selected European countries, 2009-13, N = 413,910

ICI is very low in Hungary compared to UK, FI, DE, DK, NL data.

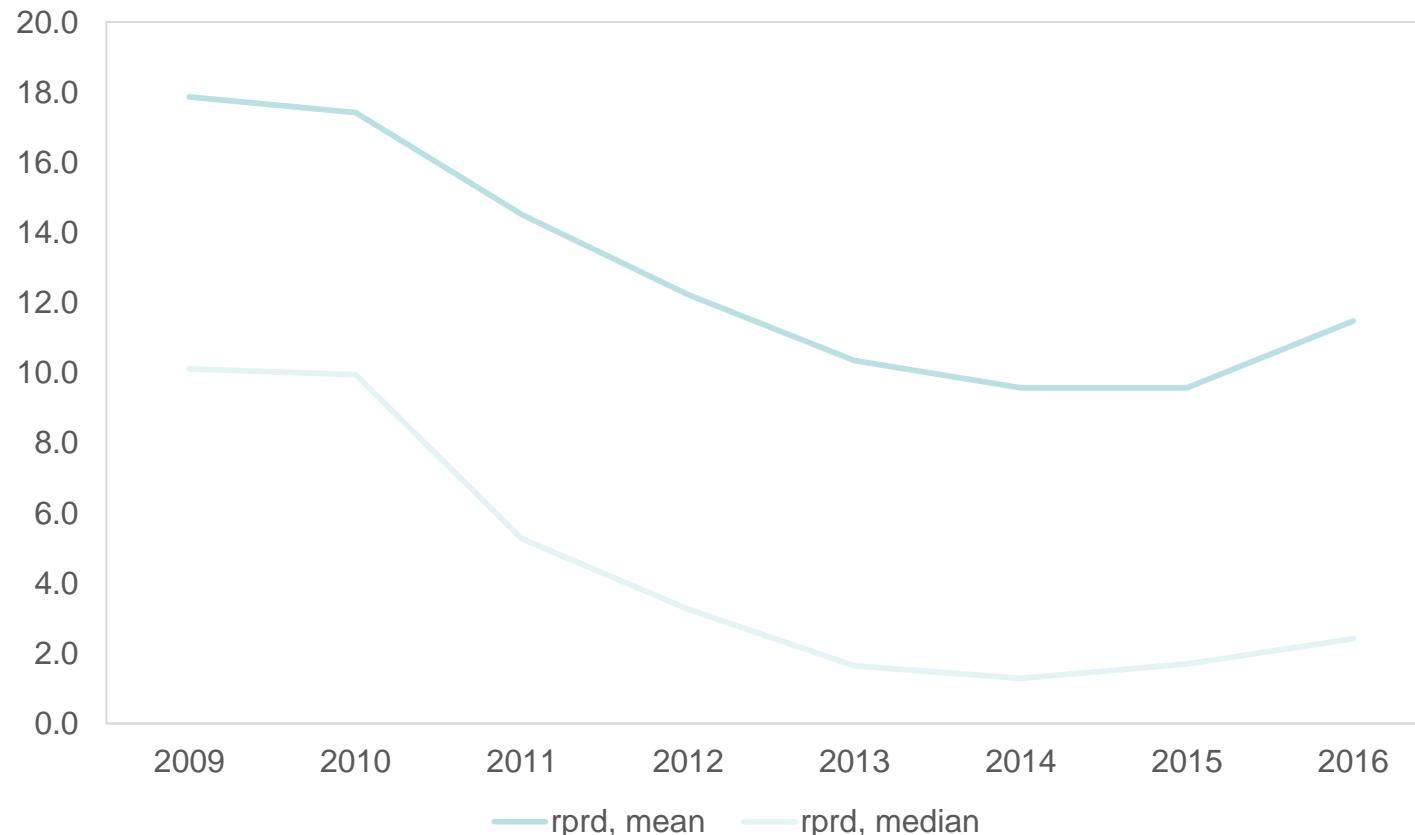
Source: CRCB own calculation based on [TED](#) data



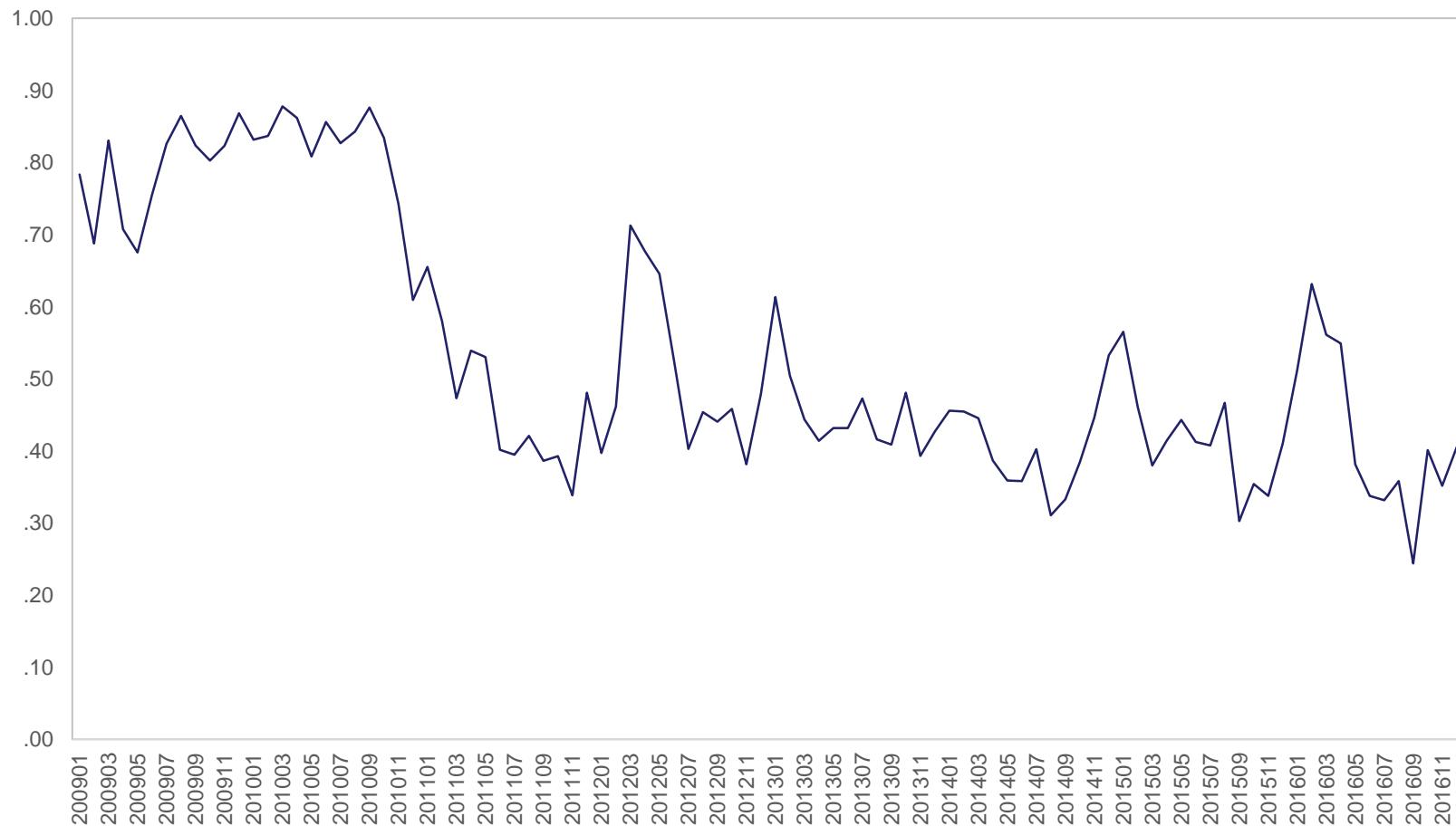
Median value of ICI in selected European countries, 2006-15, N = 261,176



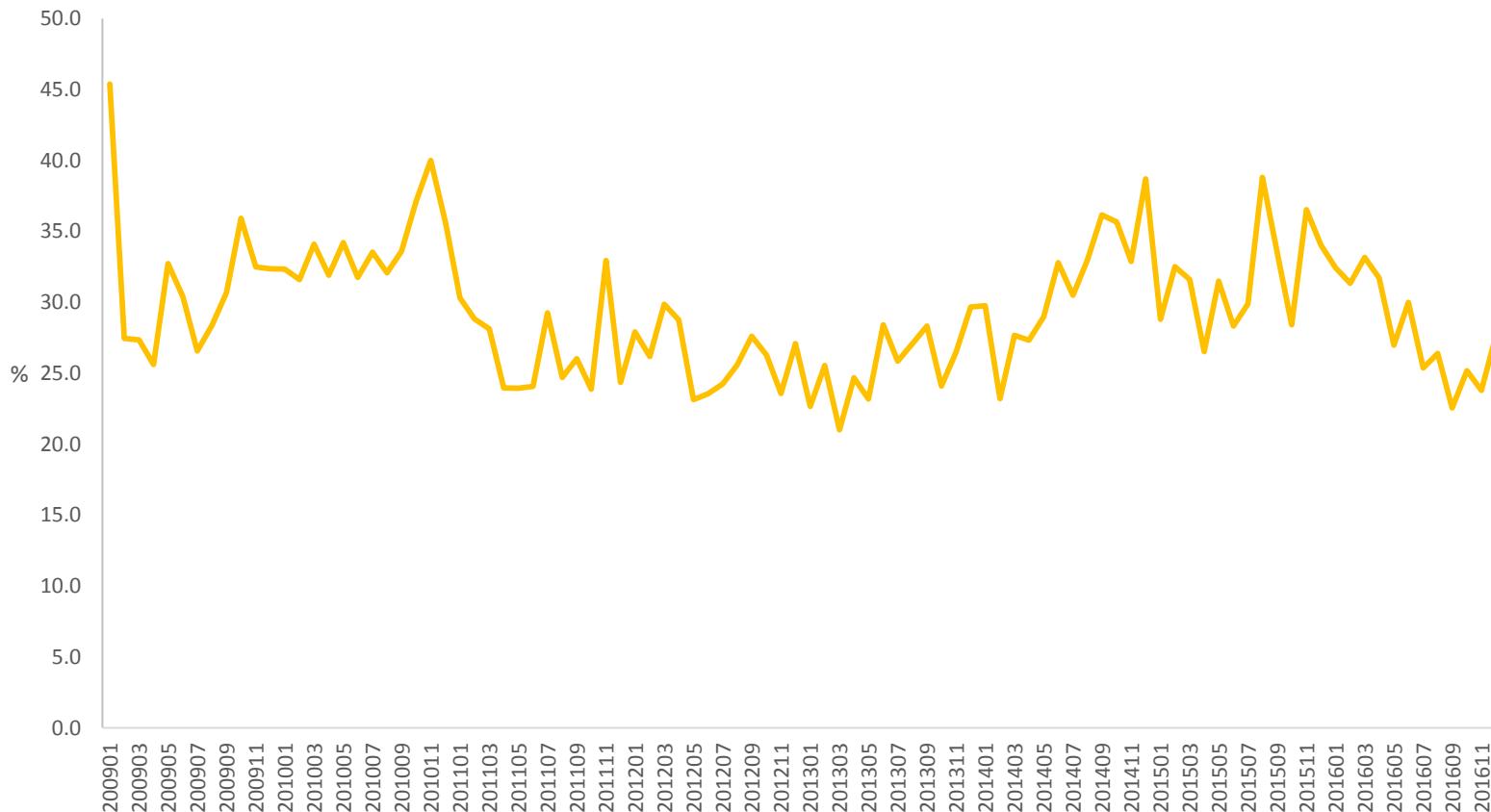
The mean and median RPRD value by year (rprd ≥ 0), %, 2009-2016, N = 75,466



Rate of contract with transparent procedures in total number of tenders (TI), 2009-2016, N = 151,457



Share of tenders with Single Bidder (SB) in total number of tenders, % 2009-2016, N = 149,786

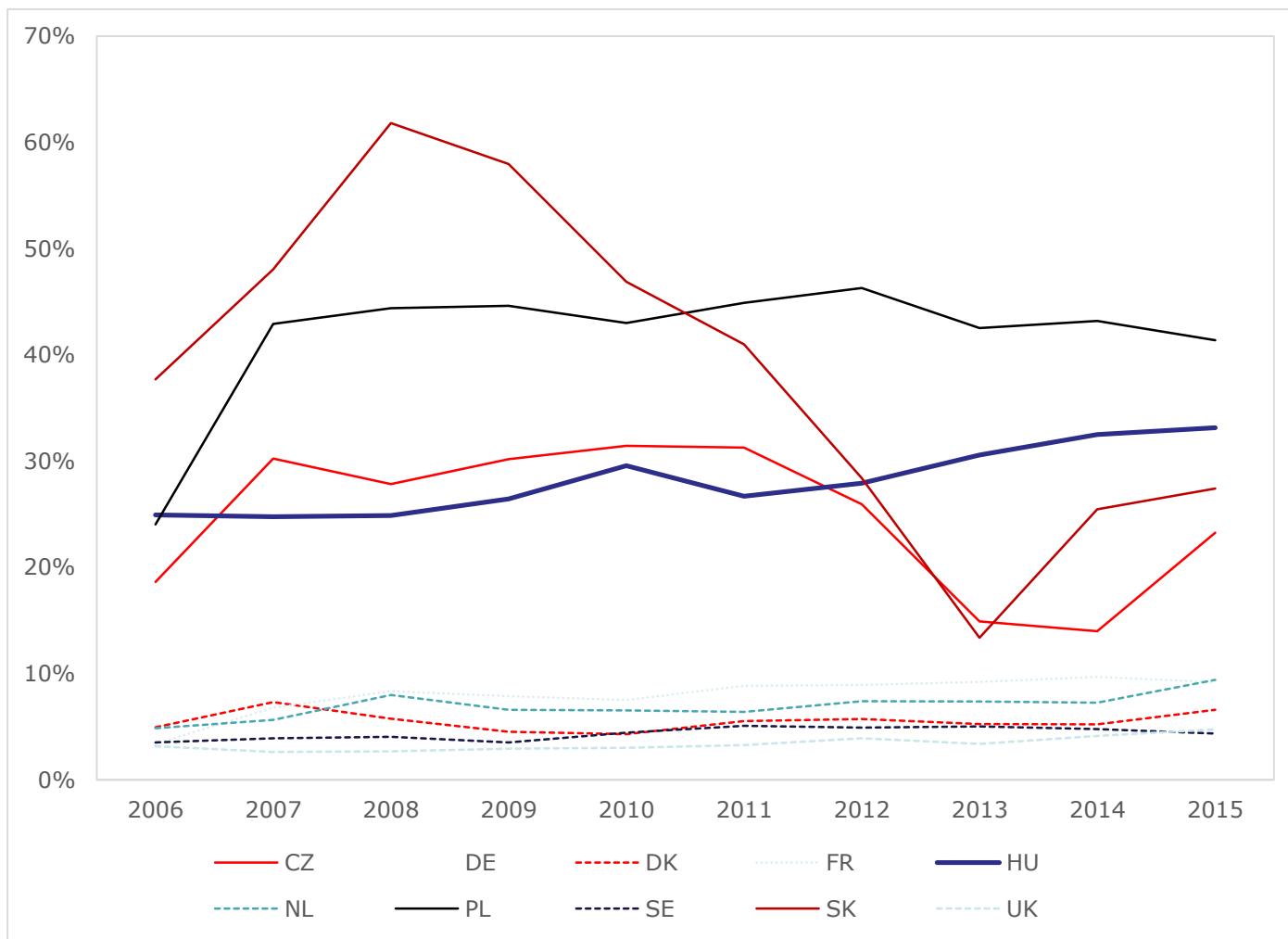


Share of PP without competition (SB) in selected EU countries, 2009-15, N = 3,127,324

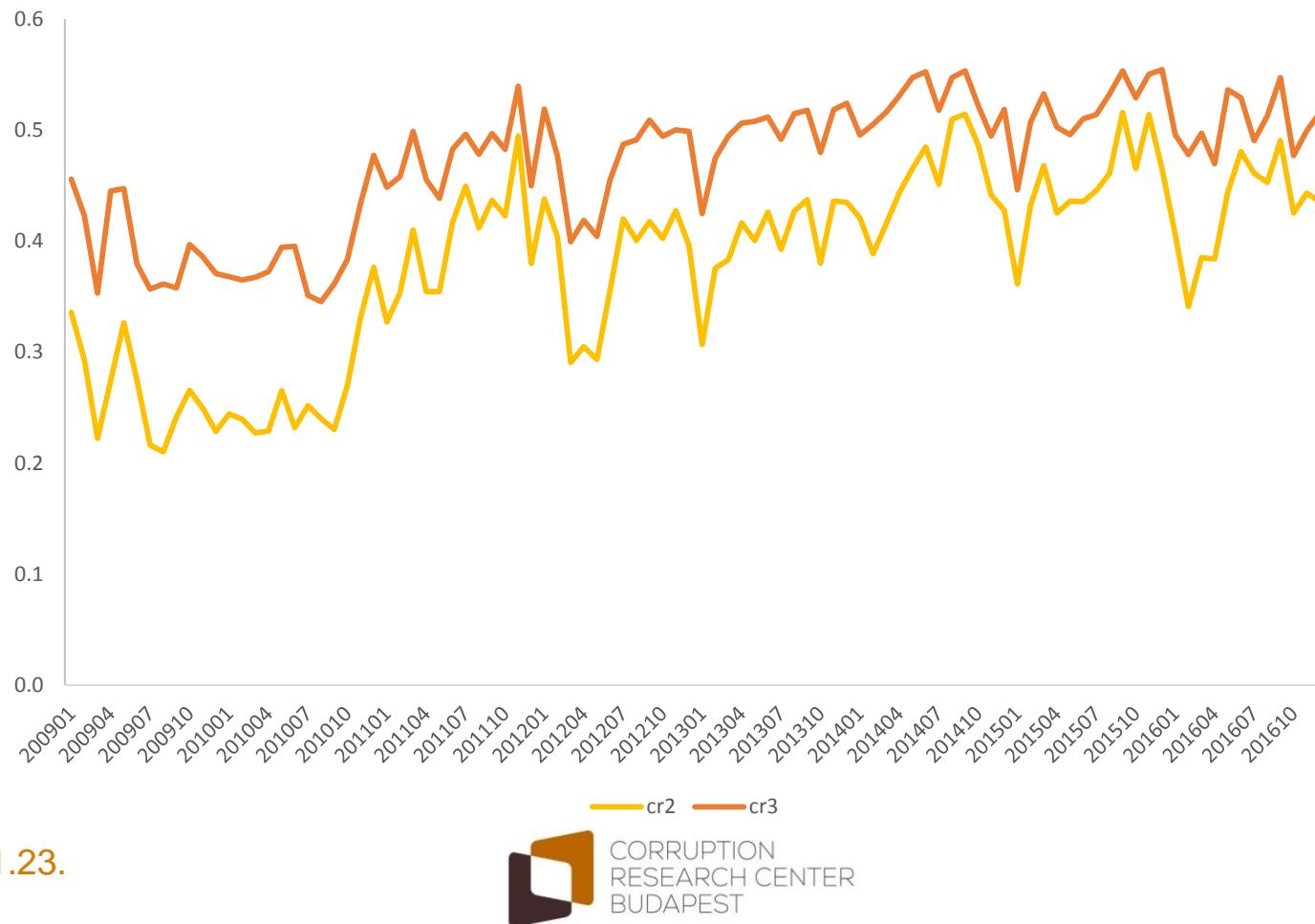
SK: quick decrease

Poland: the highest level (44-47%)

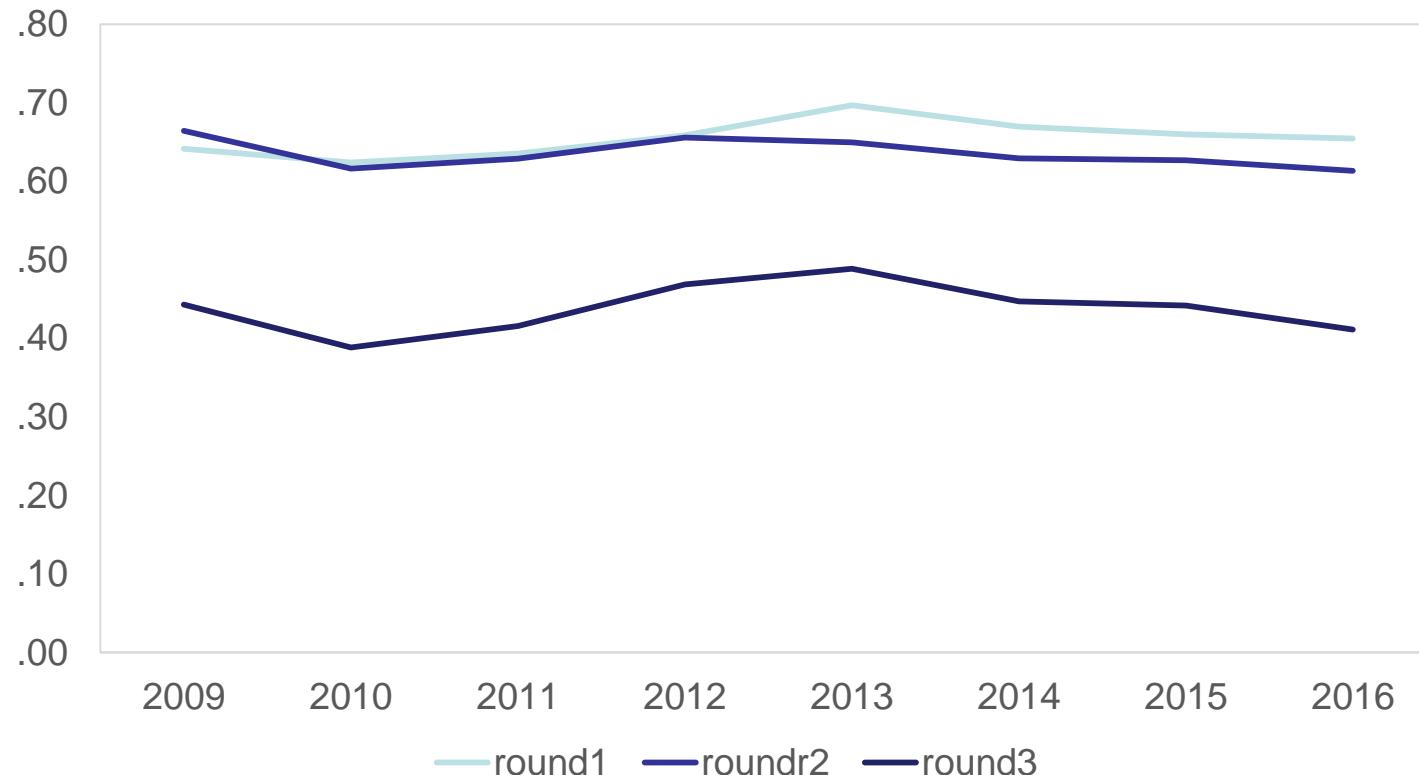
UK, DK, DE, FR, SE: lowest level



The value of CR2 and CR3 in HPP, 2009-2016, N = 149,786



ROUND1, ROUND2 and ROUNDR3, 2009-2016,



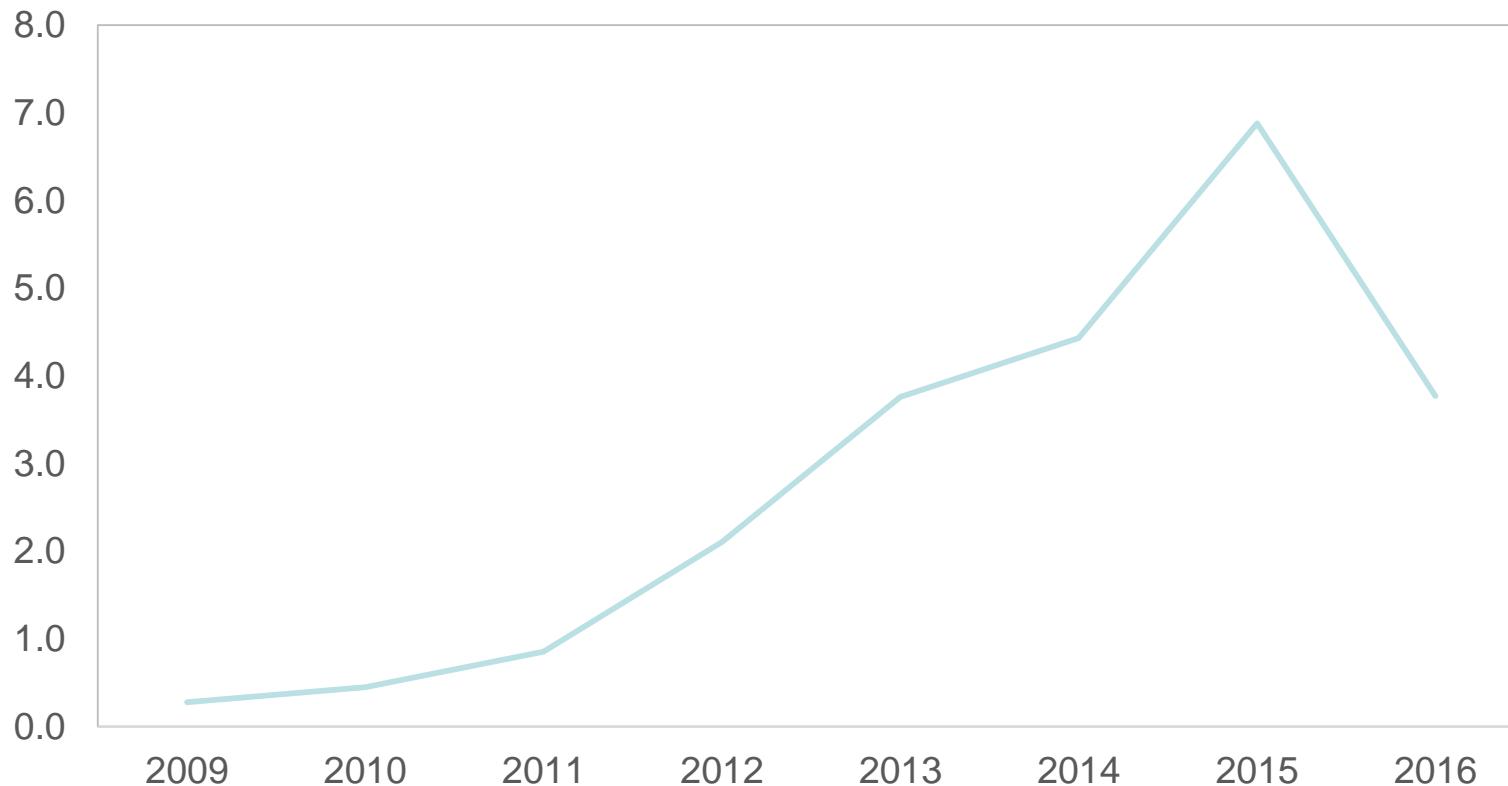
Price distortion by First Digit Test (Benford's Law)

Measurement of price distortion by Mean Squared Error (MSE):

$$MSE = \frac{1}{n} \sum_{i=1}^n (\hat{Y}_i - Y)^2$$

where \hat{Y} is the predicted value and Y is the observed value in percentages.

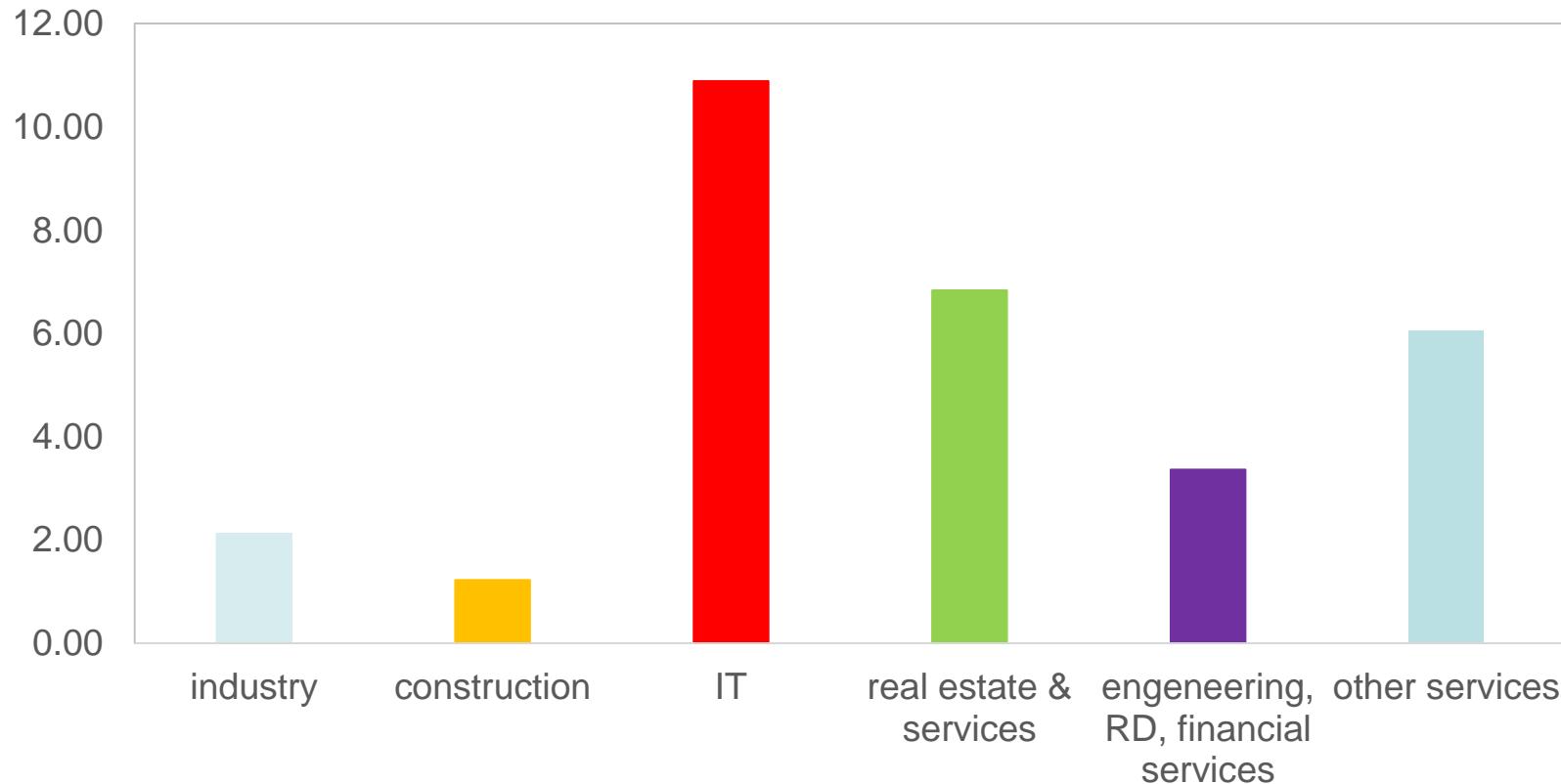
The price distortion over the period: the (MSE) of contract prices of HPP from the theoretical (Benford's) distribution, 2009-2016, N = 138,743



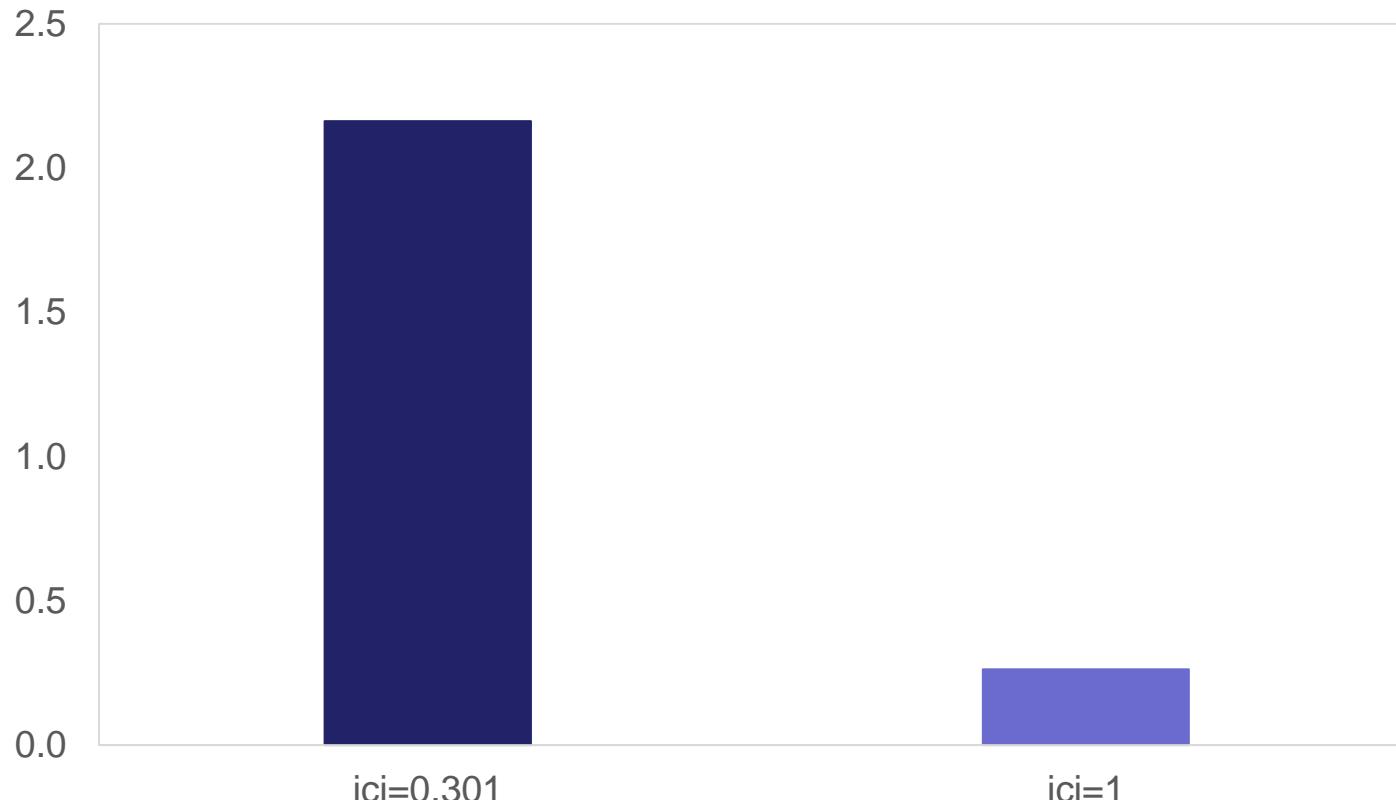
CORRUPTION & INTENSITY OF COMPETITION



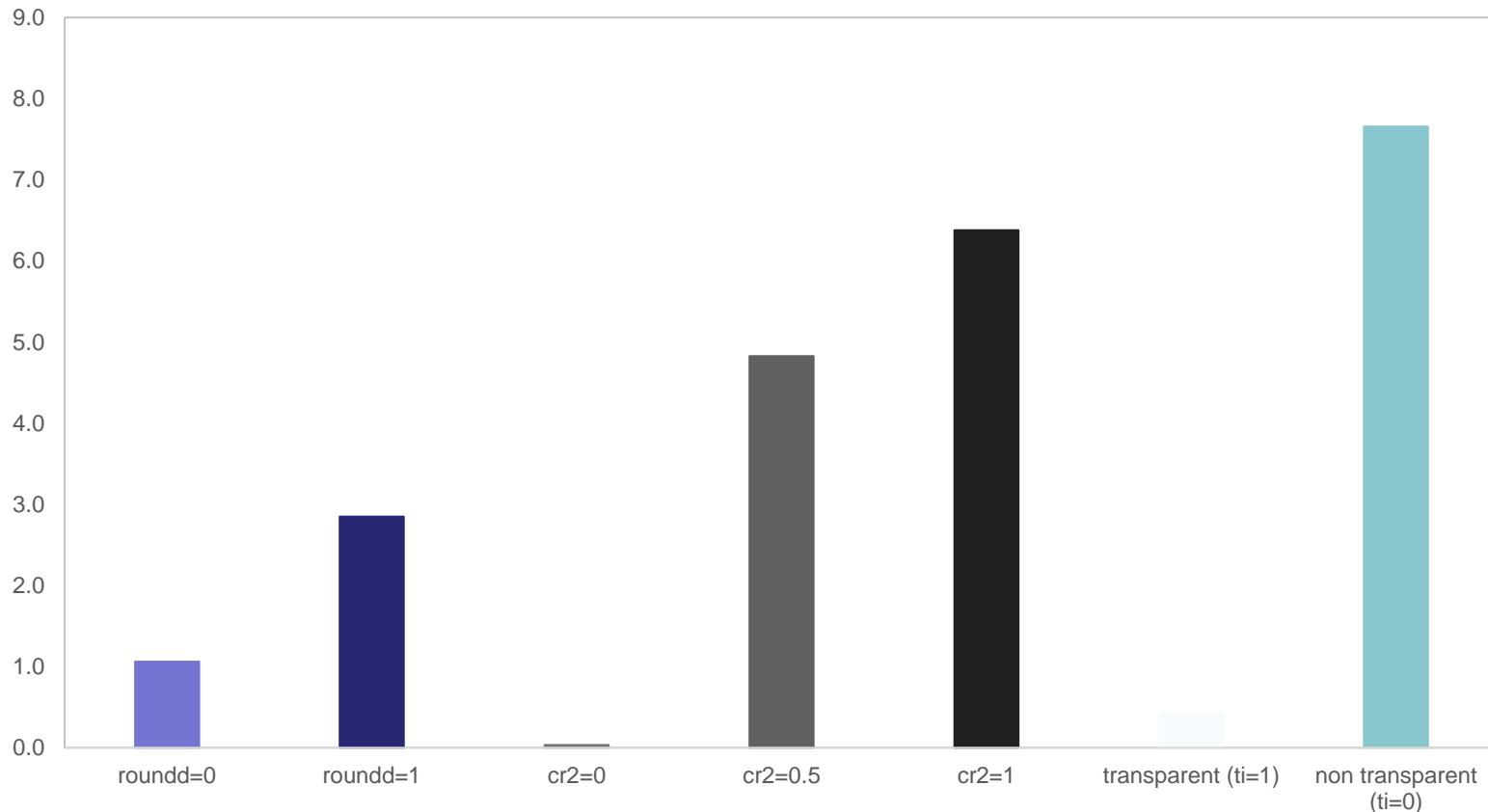
The price distortion by sector: the (MSE) of contract prices of HPP from the theoretical (Benford's) distribution, 2009-2016, N = 135,327



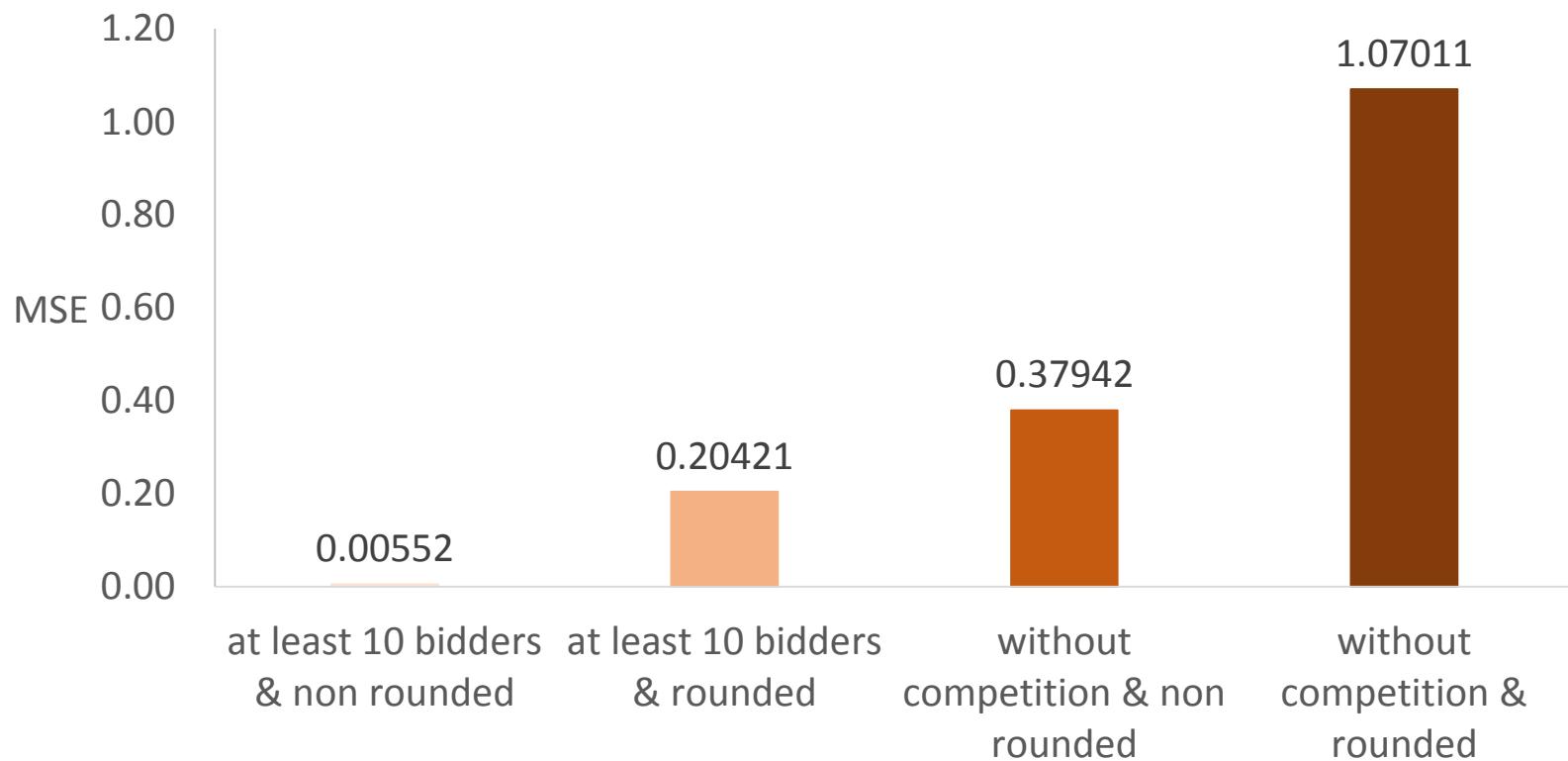
The price distortion by ICI: the (MSE) of contract prices of HPP from the theoretical (Benford's) distribution, 2009-2016, N = 34,418



The price distortion by CR2, TI & rounded data: the (MSE) of contract prices of HPP from the theoretical (Benford's) distribution, 2009-2016

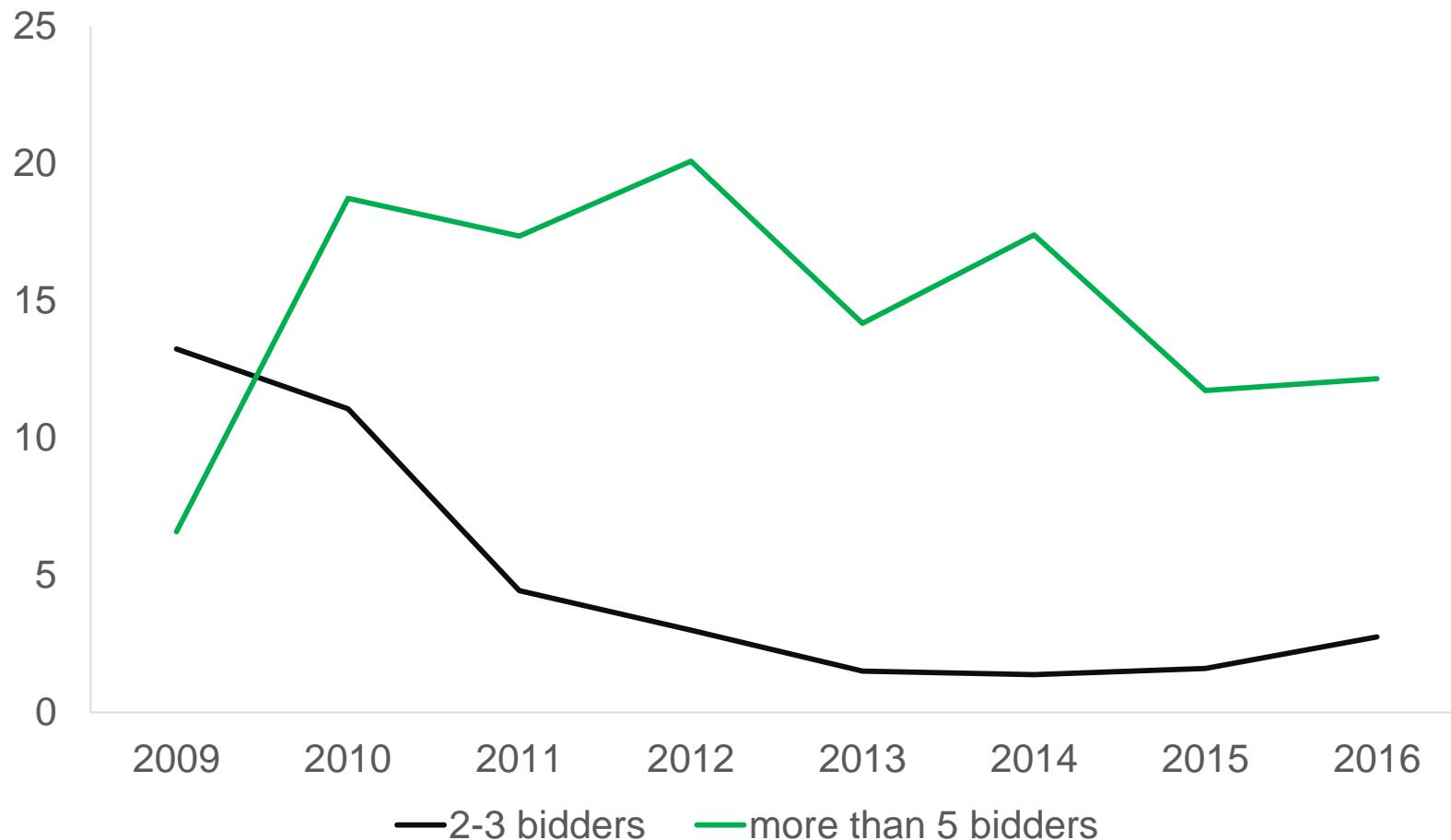


The price distortion by number of bids & rounded data: the (MSE) of contract prices in EURO area from the theoretical (Benford's) distribution, 2006-2015, N = 285,020

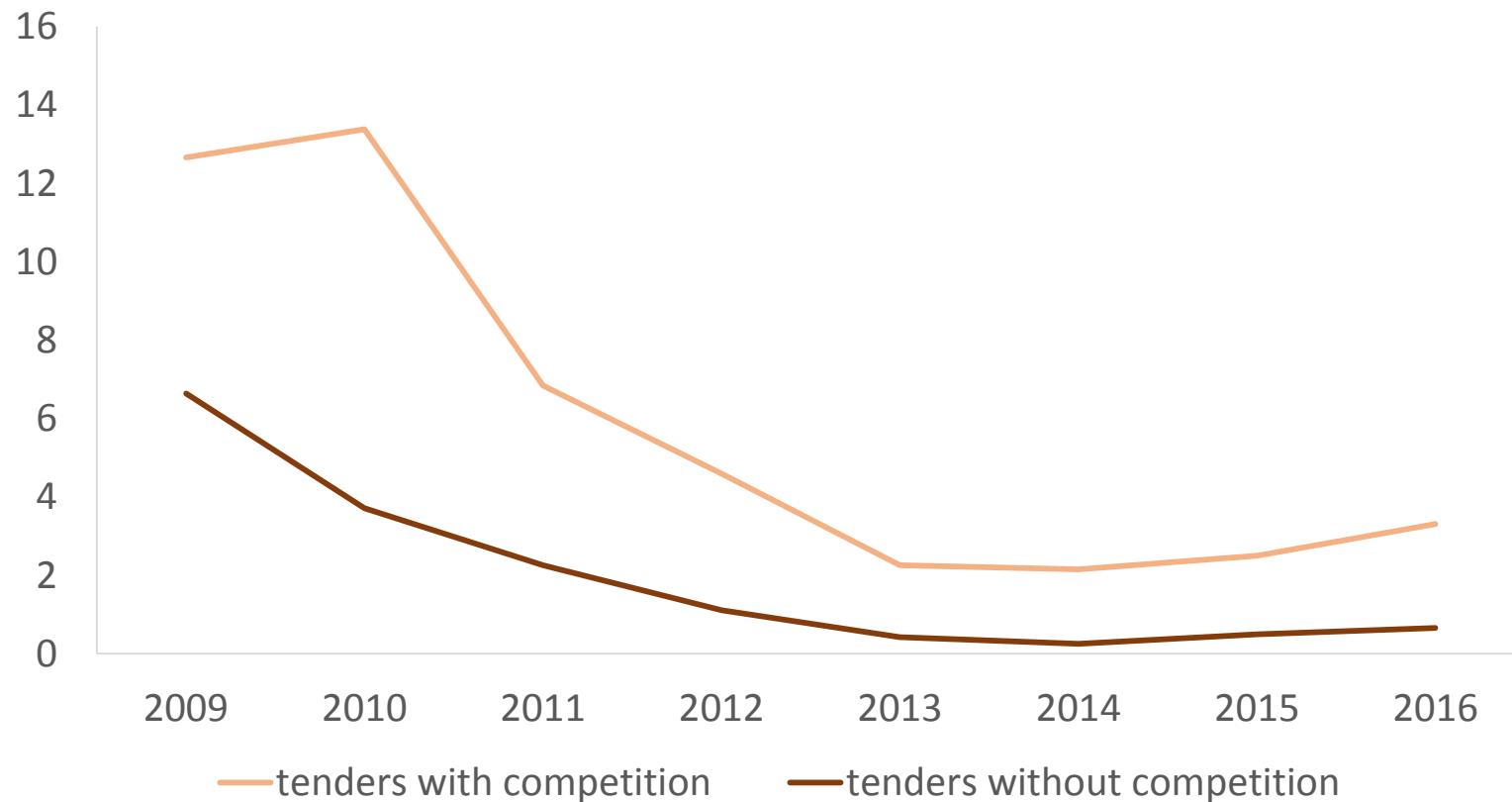


Source: CRCB own calculation based on TED data

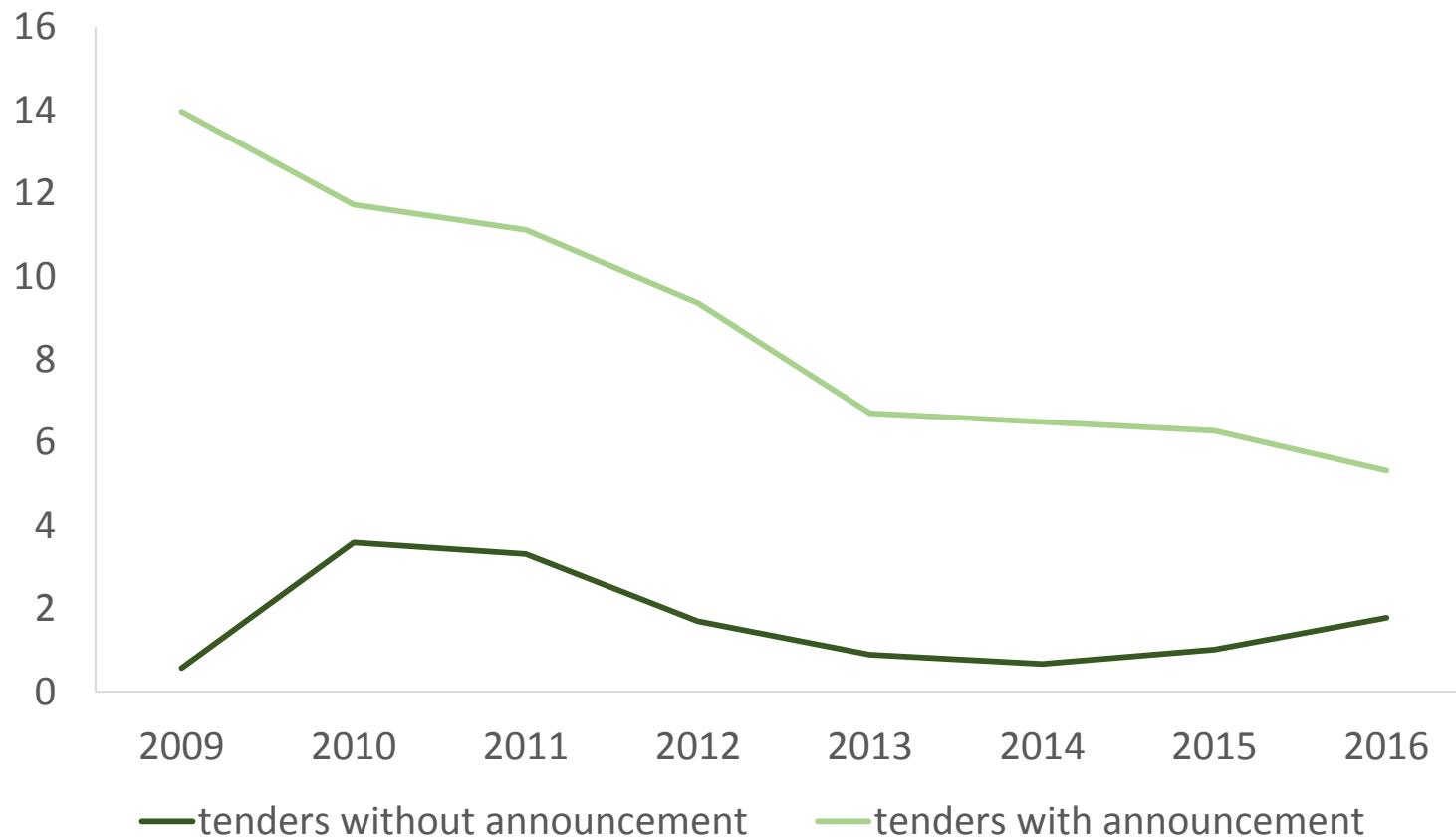
The median RPRD values by number of bids ($rprd \geq 0$), %, 2009-2016, N = 44,173



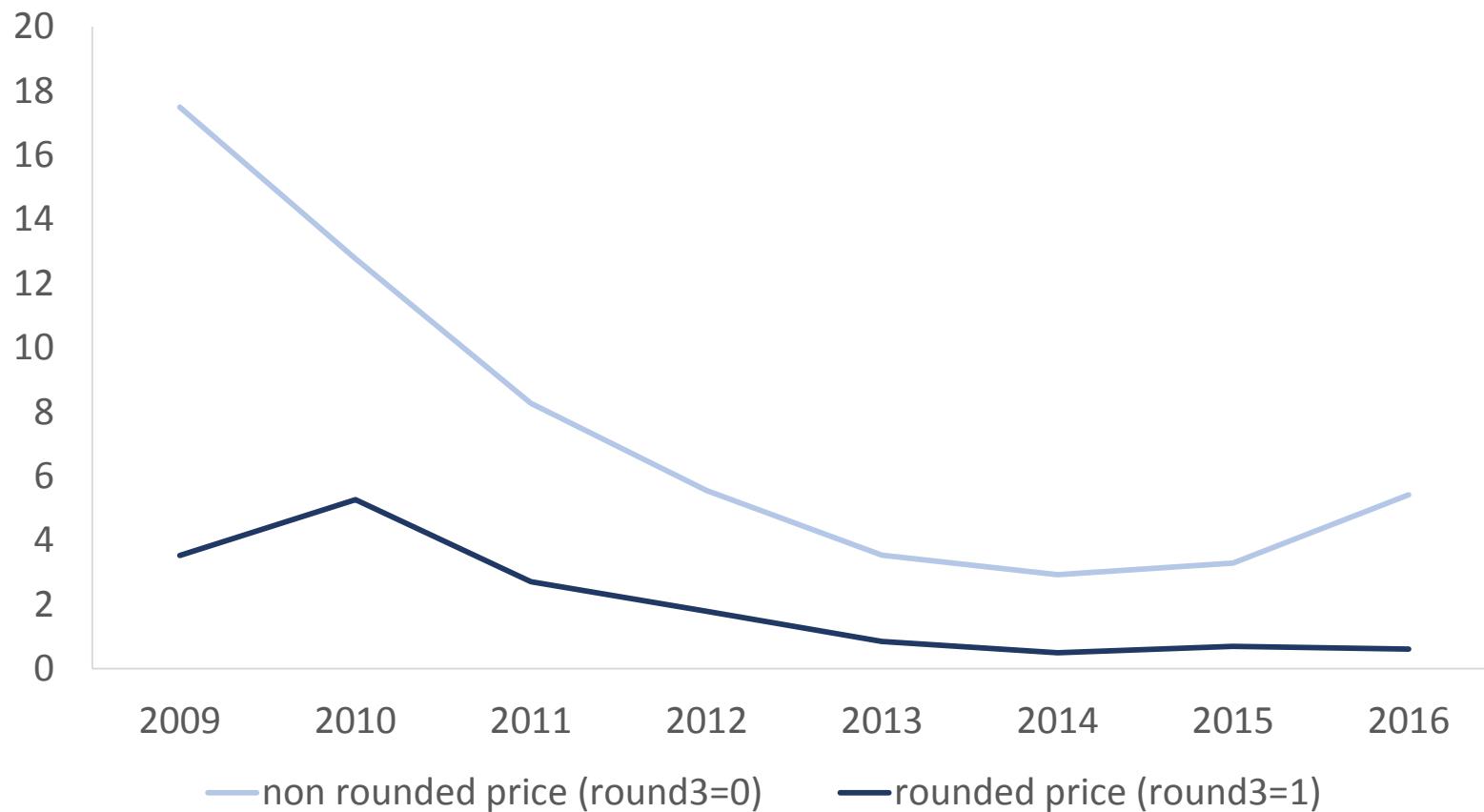
The median RPRD values by SB ($rprd \geq 0$), %, 2009-2016, N = 75,064



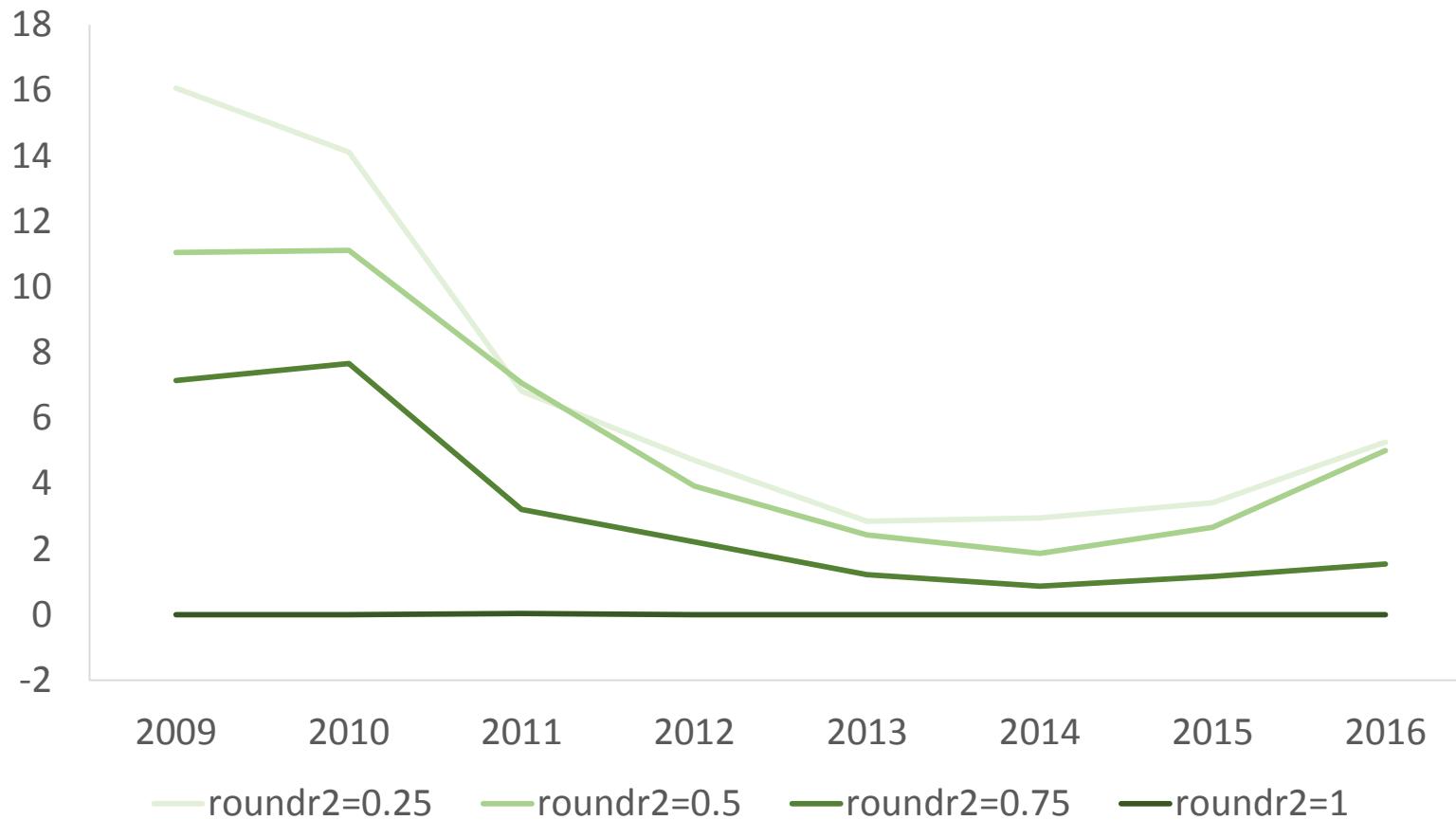
The median RPRD values by TI ($rprd \geq 0$), %, 2009-2016, N = 75,466



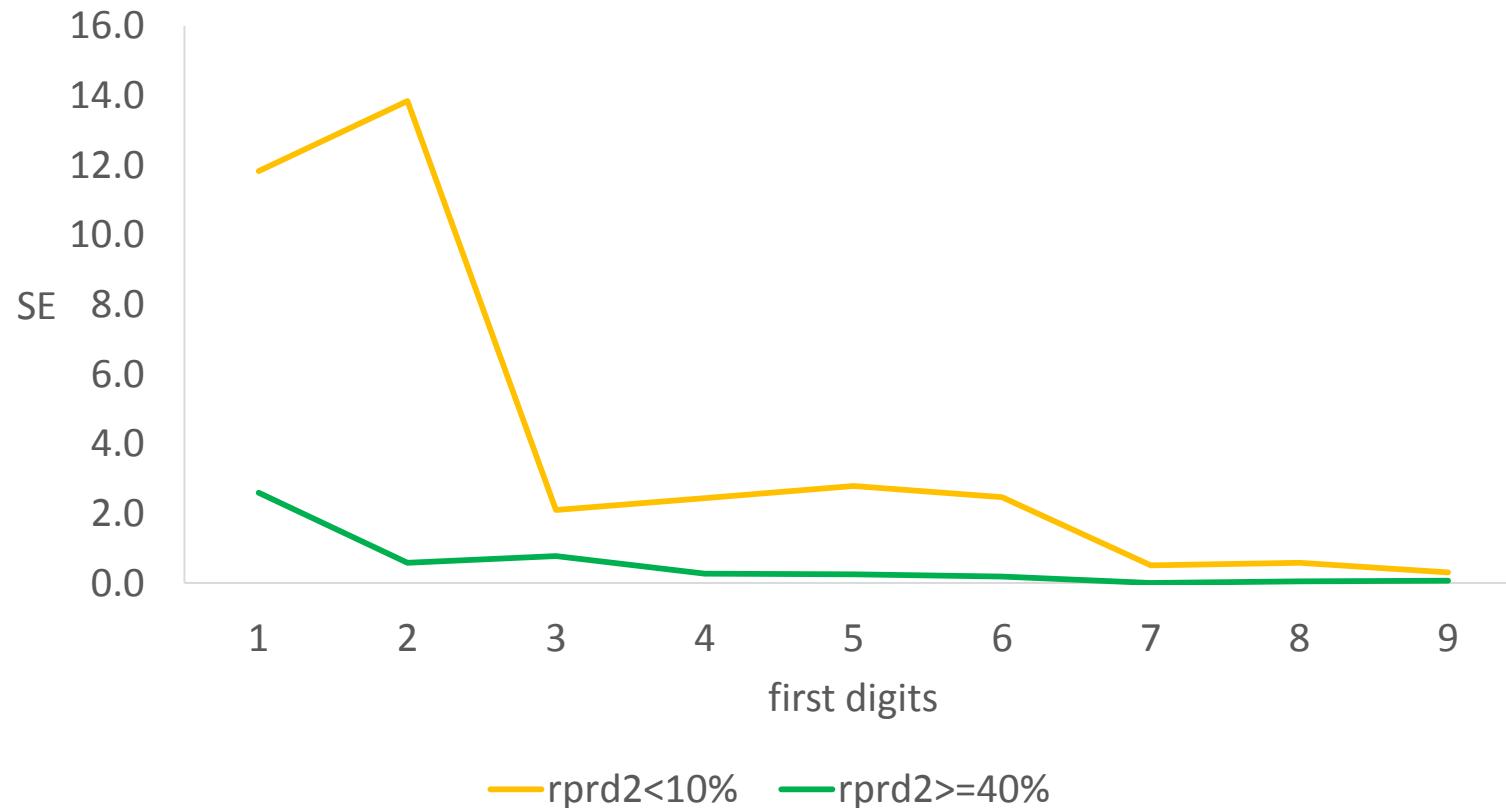
The median RPRD values by ROUND3 (rprd ≥ 0), %, 2009-2016, N = 75,466



The RPRD values by ROUND2 ($rprd \geq 0$), %, 2009-2016, N = 50,824



The First Digit Test by weight of RPRD, SE, 2009-2016, N = 119,502

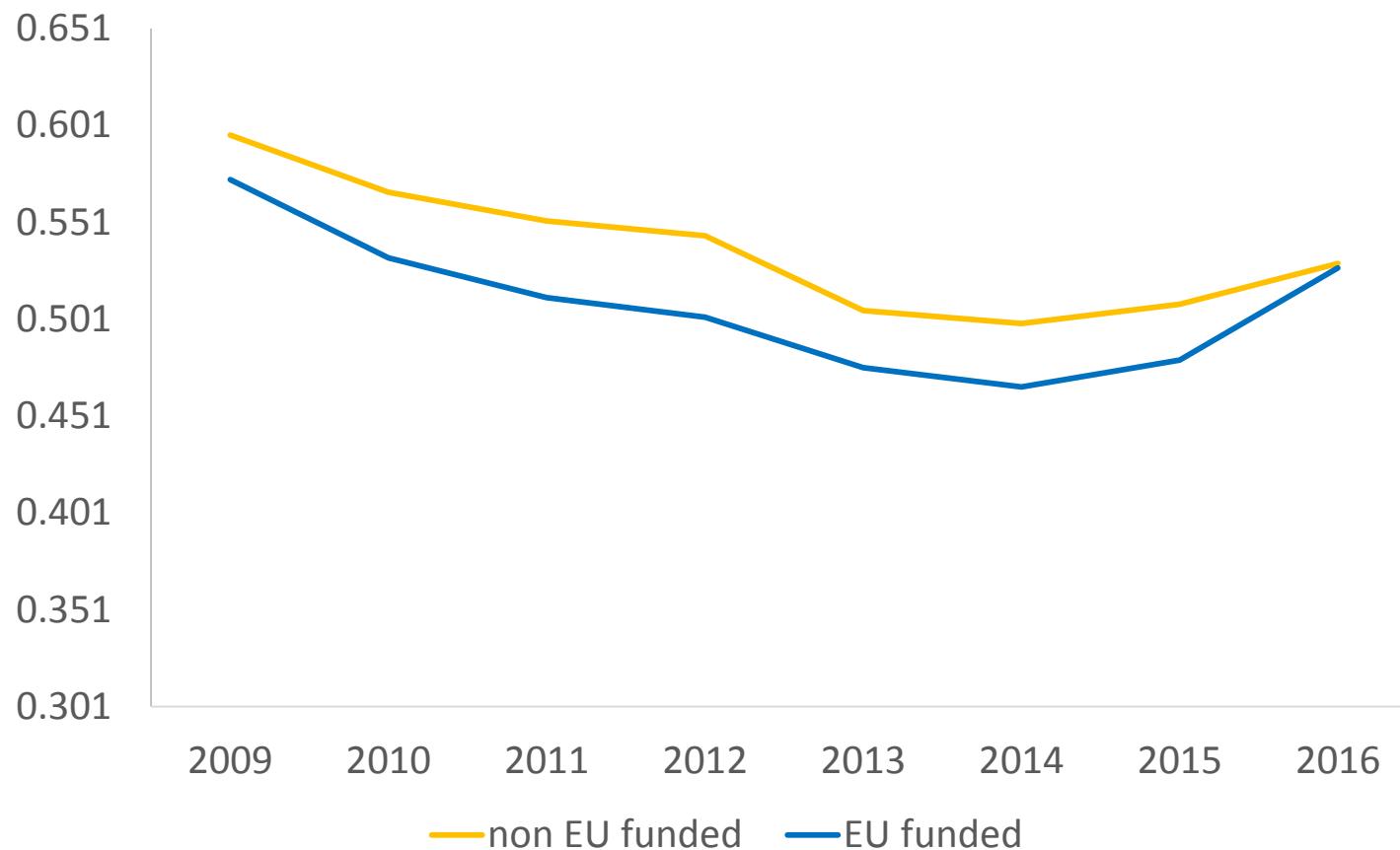


Corruption risk, price distortion and intensity of competition – summary

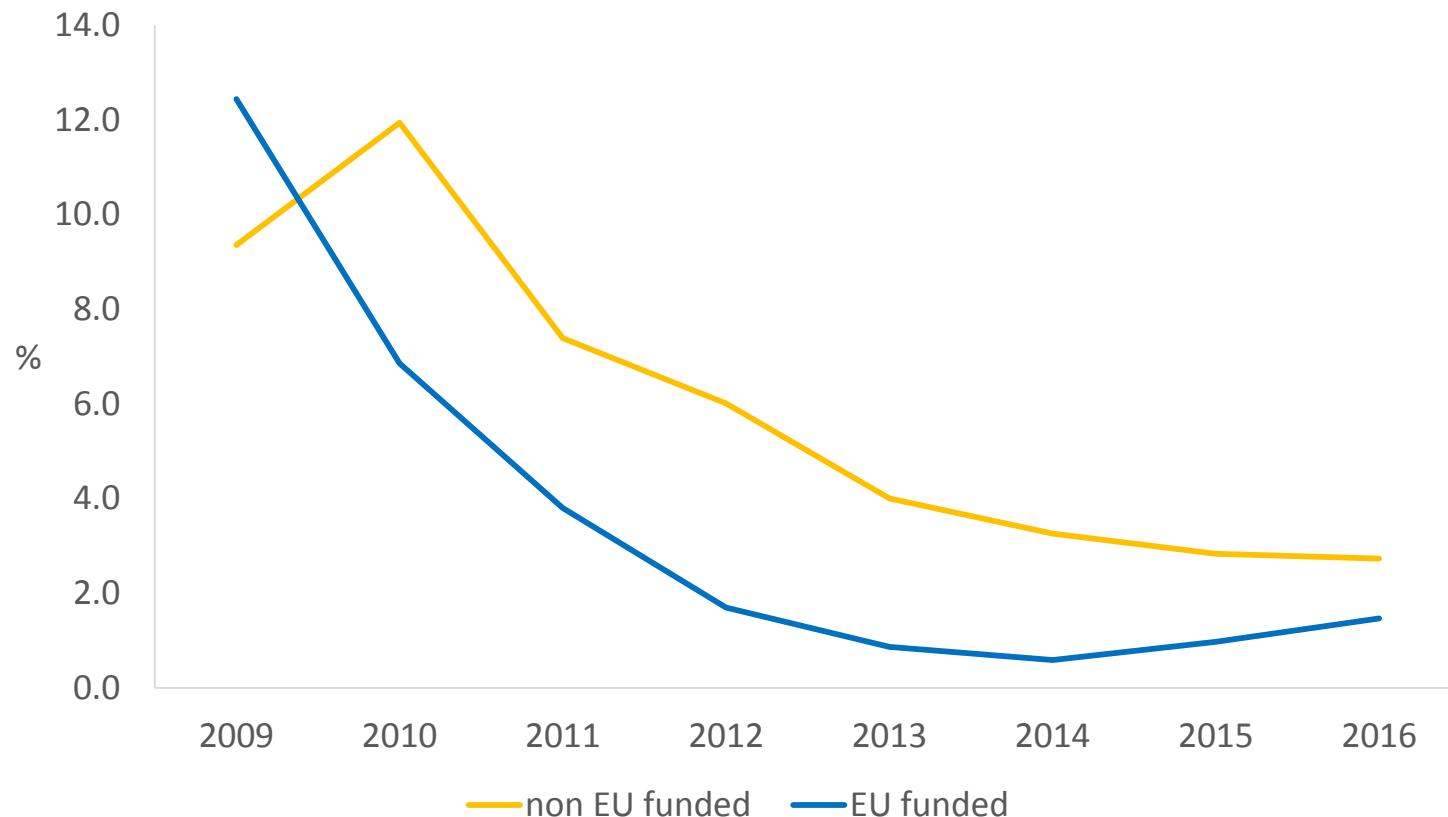
		corruption				competition	
		CR2	CR3	ROUND	BENFORD (FDT)	ICI	RPRD
corruption	CR2	-	-	positive	positive	-	negative
	CR3		-	positive	positive	-	negative
	ROUND			-	positive	negative	negative
	BEFORD (FDT)				-	negative	negative
competition	ICI					-	positive
	RPRD						-

EU vs non-EU FUNDING

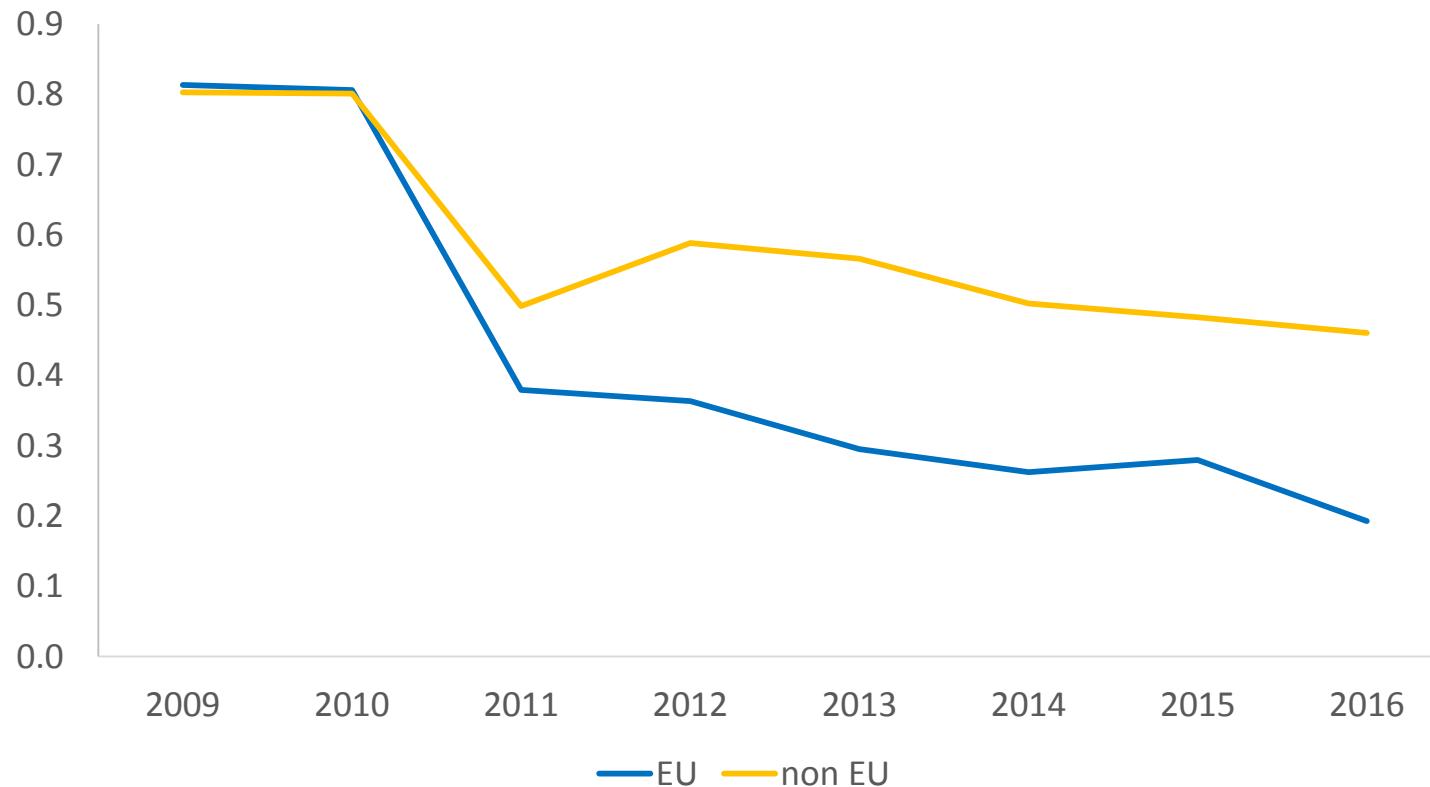
The ICI in HPP by EU funding, 2009-2016, N = 106,625



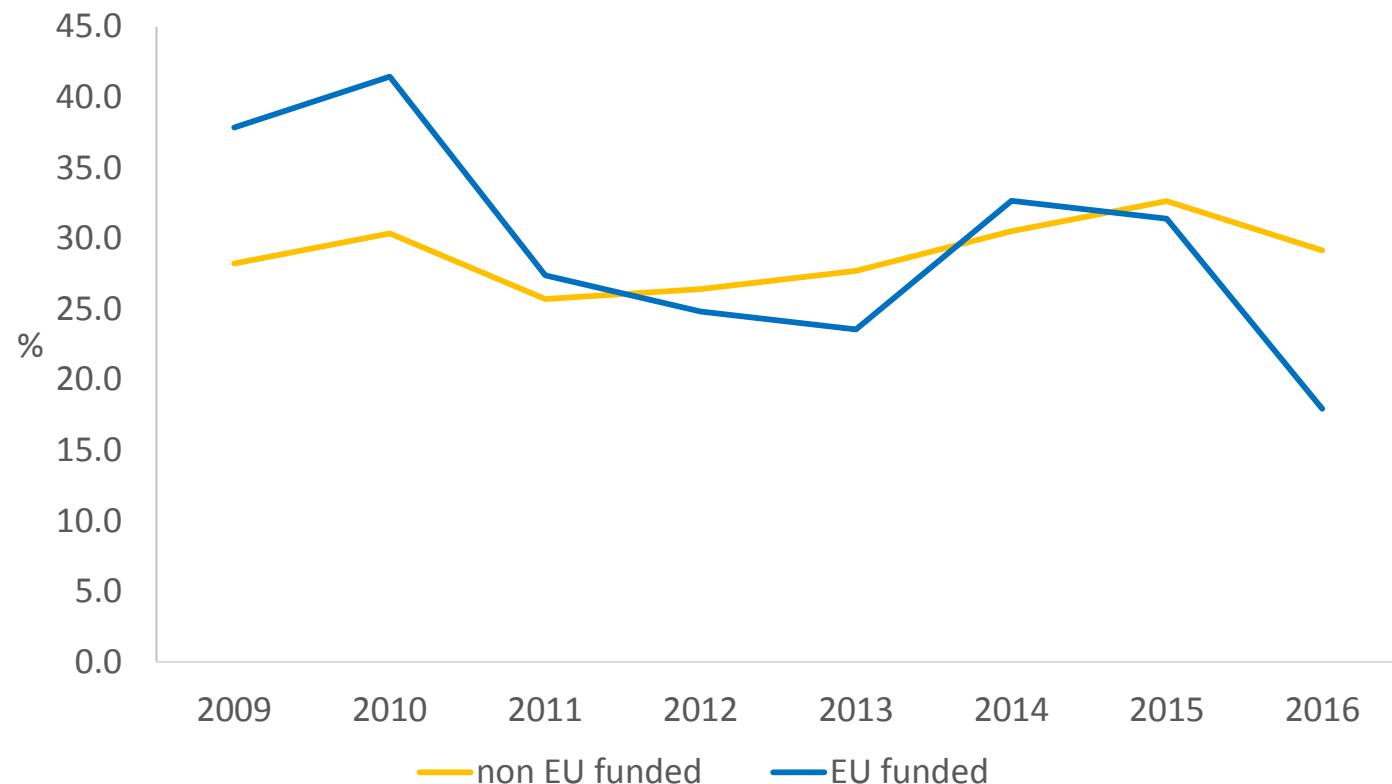
The RPRD by EU funding, 2009-2016, N = 75,246, ($rprd \geq 0$)



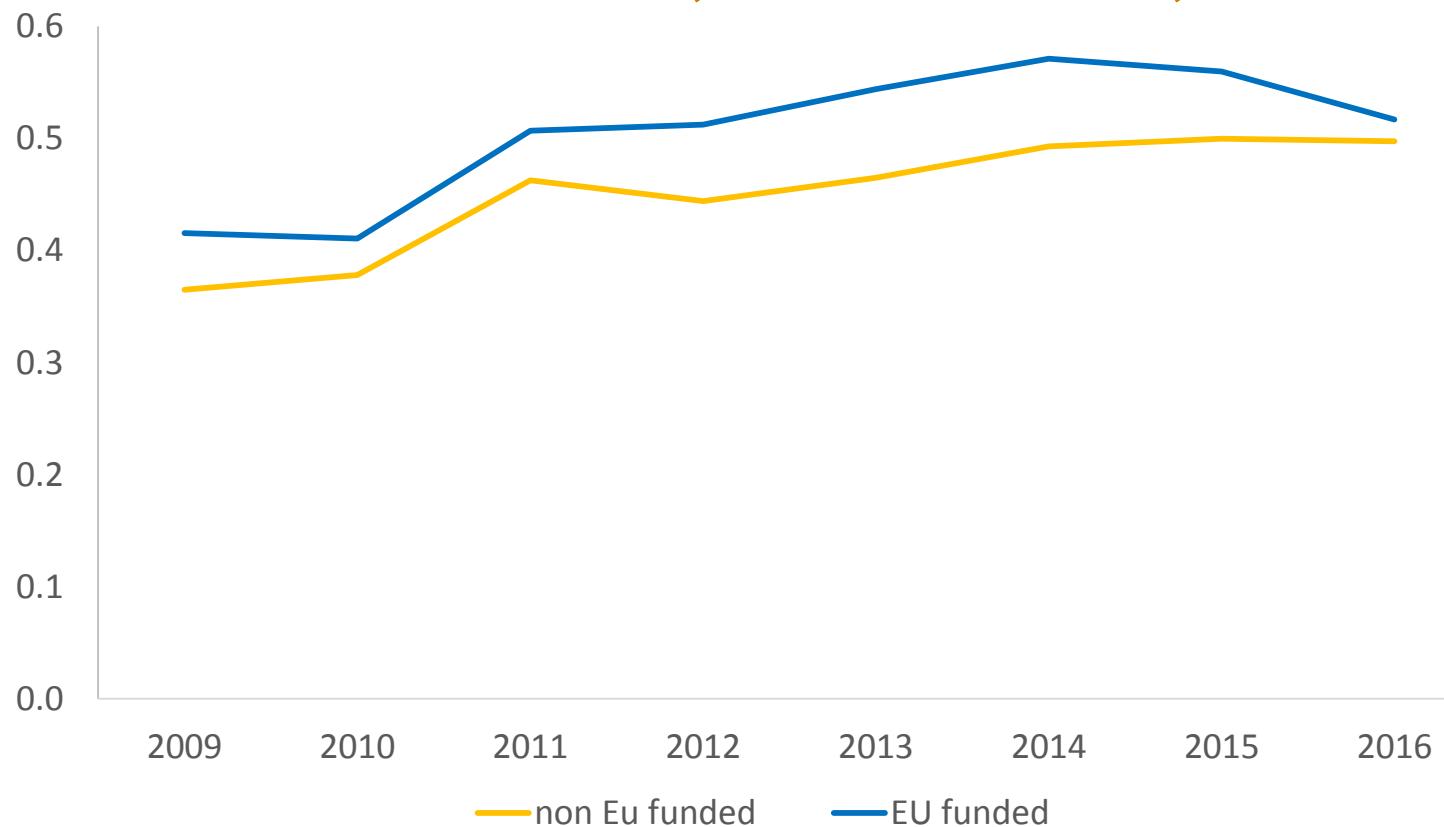
The Transparency Index (TI) of HPP in EU funded and non-EU funded tenders, 2009-2016, N = 150,942



Share of tenders with Single Bidder (SB) by EU funding, 2009-2016, $N = 149,288$



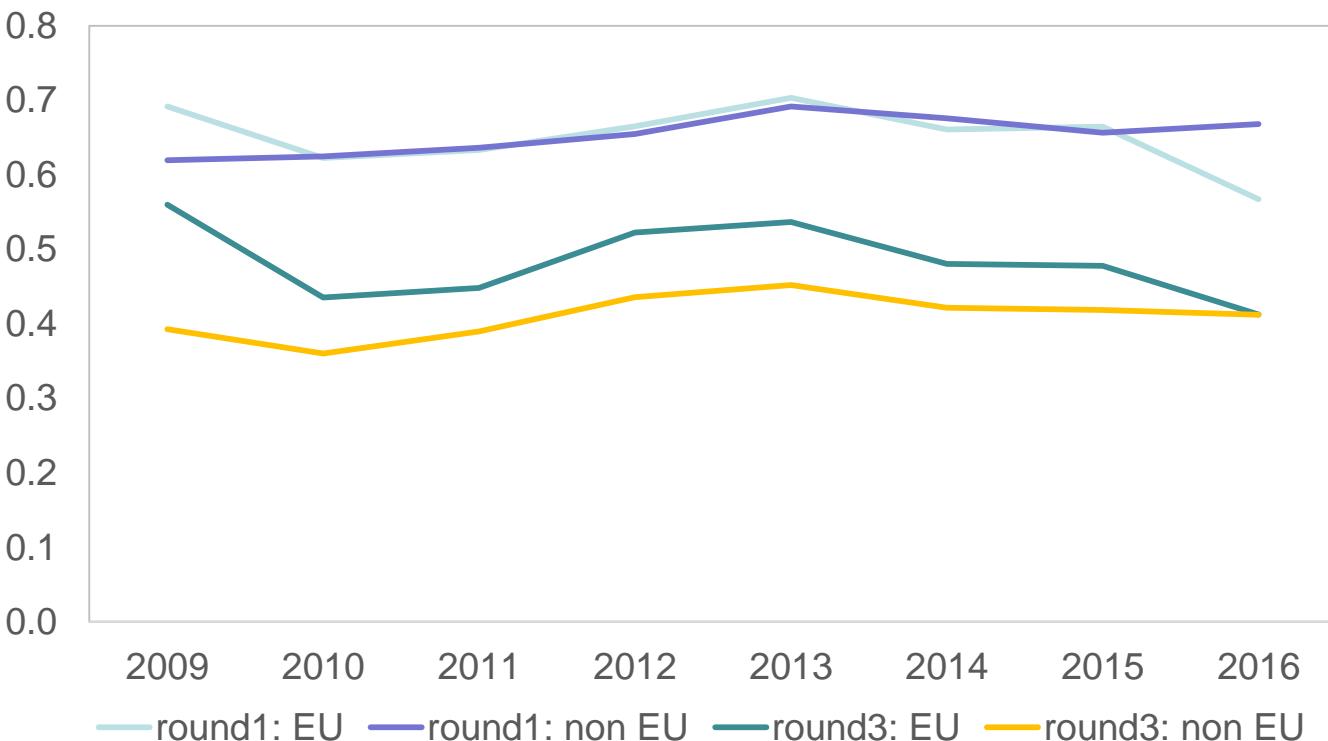
The CR3 by EU funding, 2009-2016, N = 149,288



Rounding price by EU funding, 2009-2016, N = 141,317

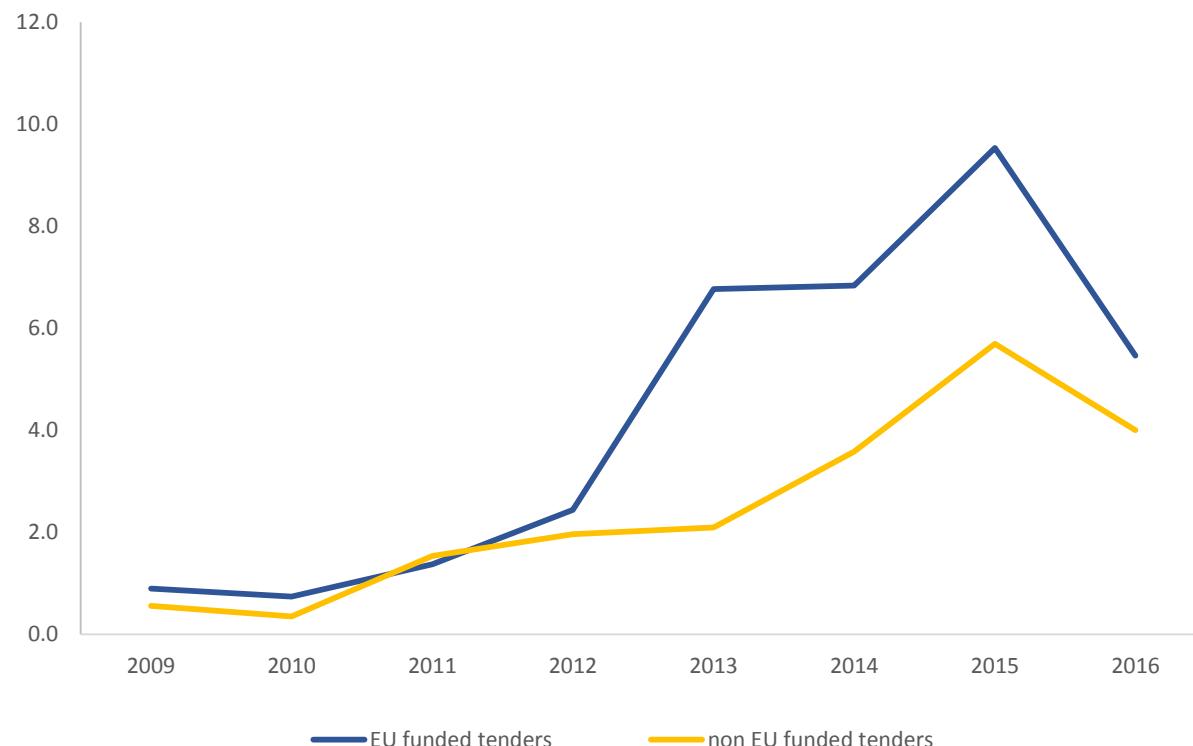
Significant
difference at
ROUND3

The prices of EU
funded tenders are
more distorted



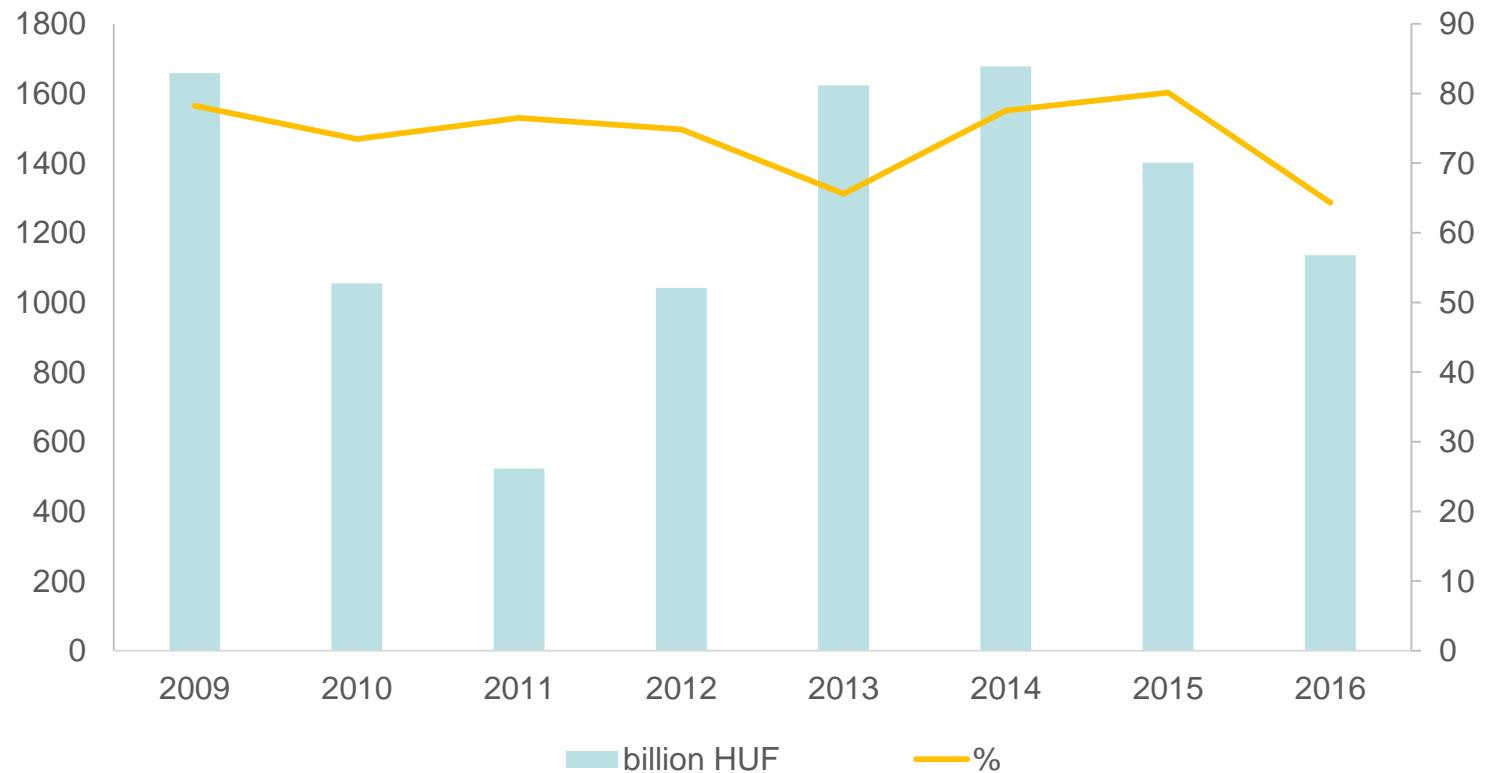
The price distortion by EU funding: the (MSE) of contract prices of HPP from the theoretical (Benford's) distribution, 2009-2016, N = N = 138,262

The prices of EU funded tenders are more distorted between 2013-16



DIRECT SOCIAL LOSS

Weight and share of total net contract value with CR3>0, 2010-2016, billion HUF and %, N = 138,743



DSL

Reference RPRD, where the corruption risks are low and intensity of competition is high.

We can estimate the rate of direct social loss in a given tender by extracting the observed rate of price drop ($RPRD_{observed}$) from the reference rate, which is derived from the “ideal”, non-corrupt cases, ($RPRD_{reference}$):

$$DSLR = RPRD_{reference} - RPRD_{observed}$$

So, for every i tender, where we have data on $RPRD$, we calculate the rate of direct social loss ($DSLR_i$) as follows:

$$DSLR_i = RPRD_{reference} - RPRD_i$$

DSL

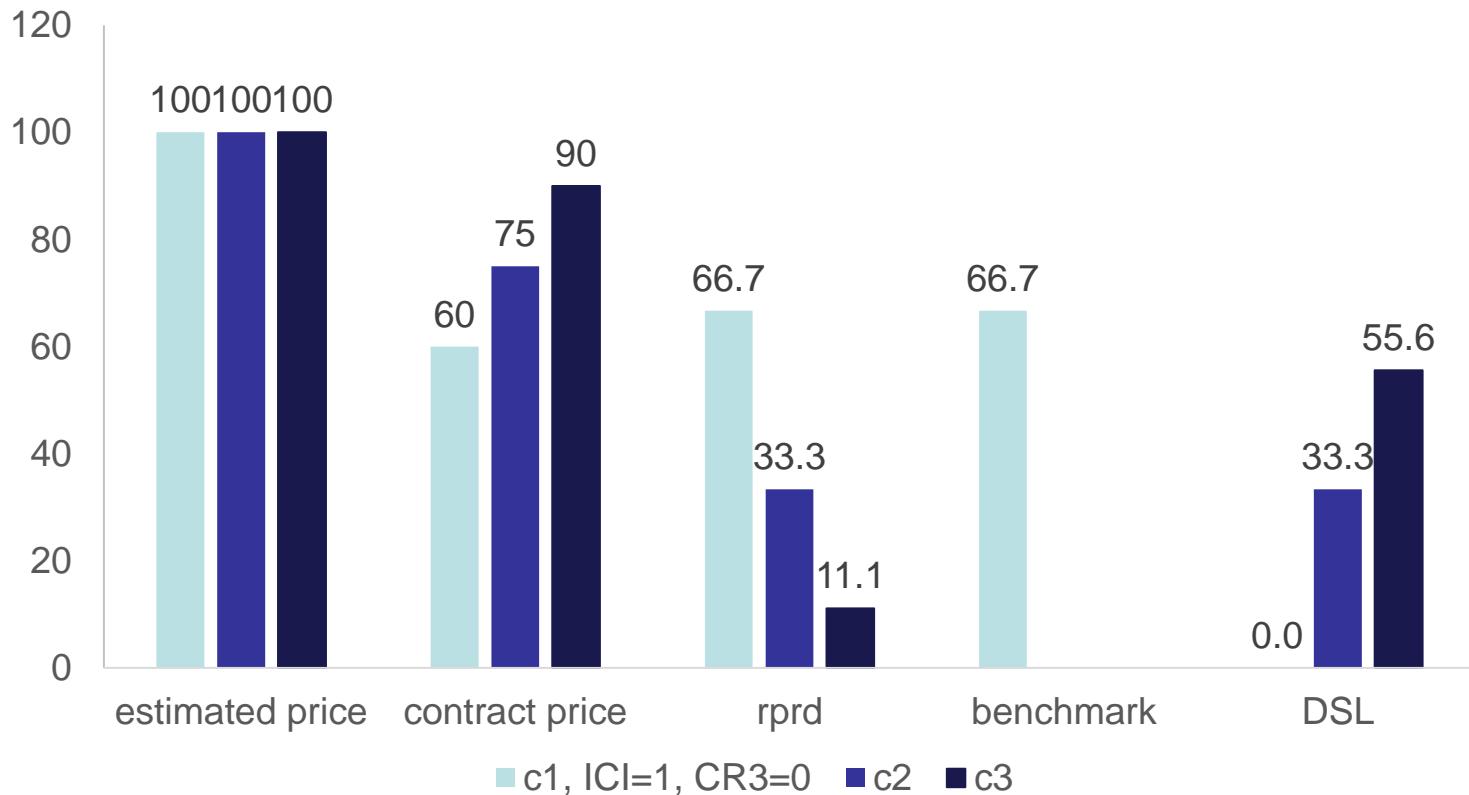
The multiplication of the $DSLR_i$ by the net contract value (P_i) of the i tender gives us the amount of social loss for every i tender:

$$DSL_i = DSLR_i * P_i$$

And finally, the aggregate direct social loss for n tenders is given by:

$$DSL = \sum_{i=1}^n DSL_i$$

Estimation of DSL_i - an illustration



$$DSL = 0 + 33,3 + 55,6 = 88,9$$

Our estimation is a lower bound estimation

We do not estimate the weight of DSL in case of the "white elephant" projects:

		corruption	no corruption
white elephants	$U(\text{pt}) \sim 0$	YES	NO
other projects	$U(\text{pt}) > 0$	YES	$\text{DSL}=0$

1st "white elephant" - losing EU taxpayer money (Bicycle Cross Track in Hatvan, closed):

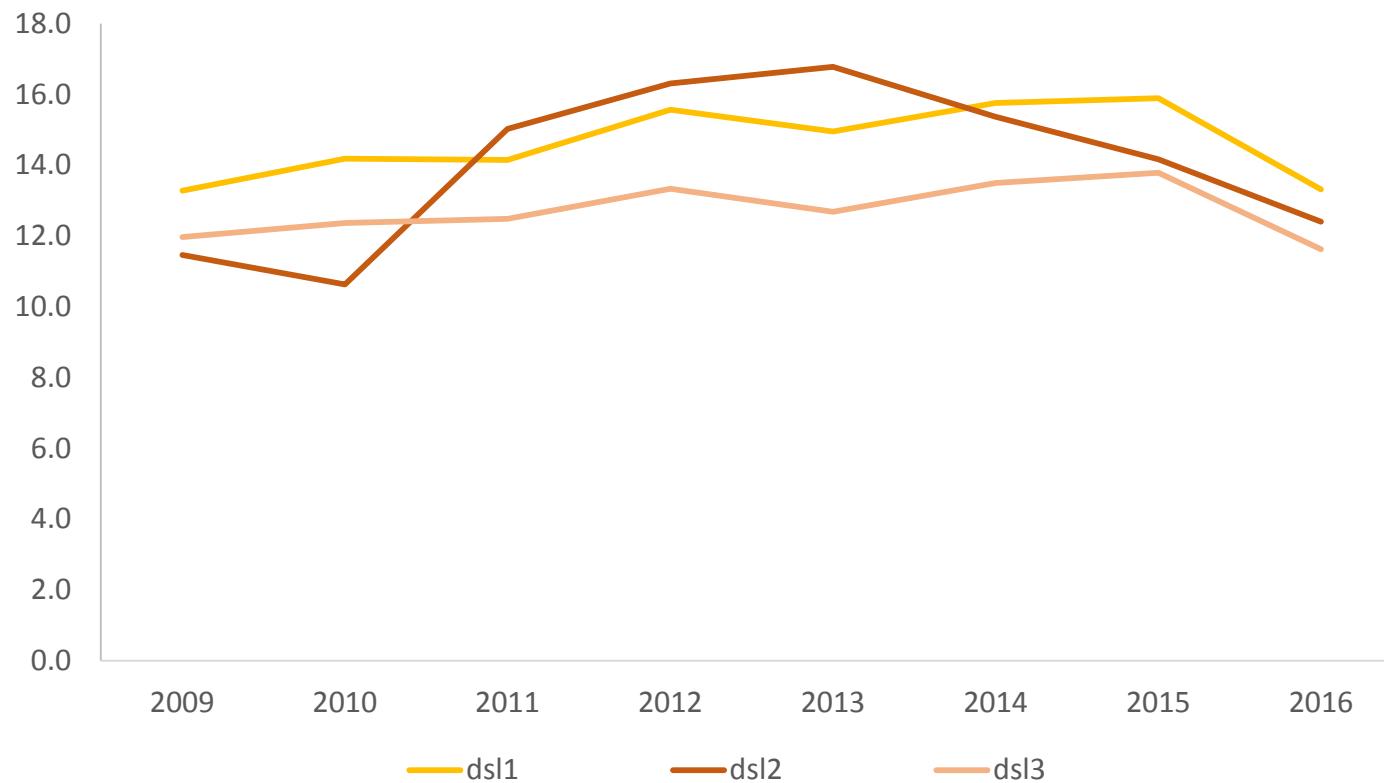


2nd "white elephant" - losing EU taxpayer money (Adventure Park in Sárazsadány: closed)

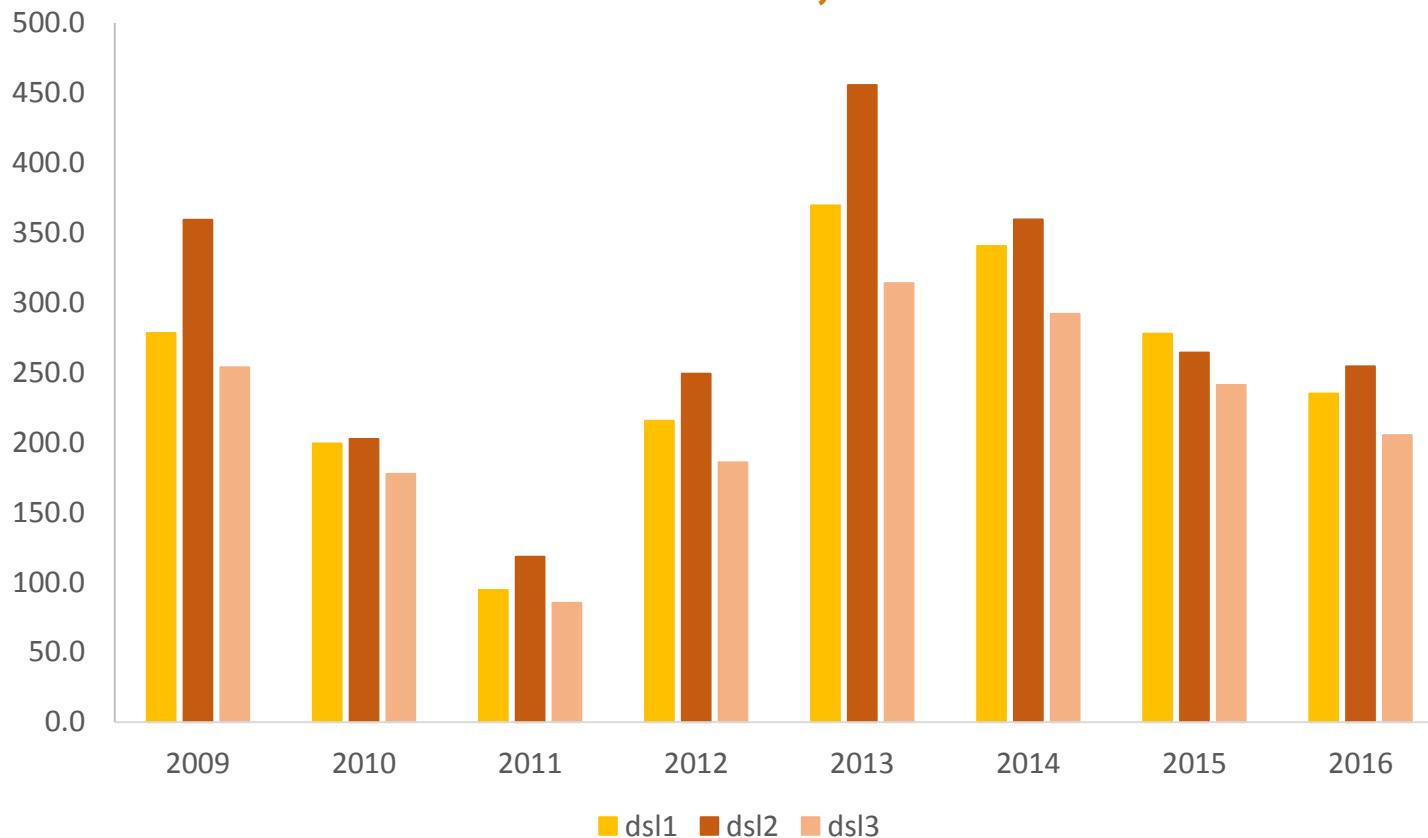


2021.11.23.

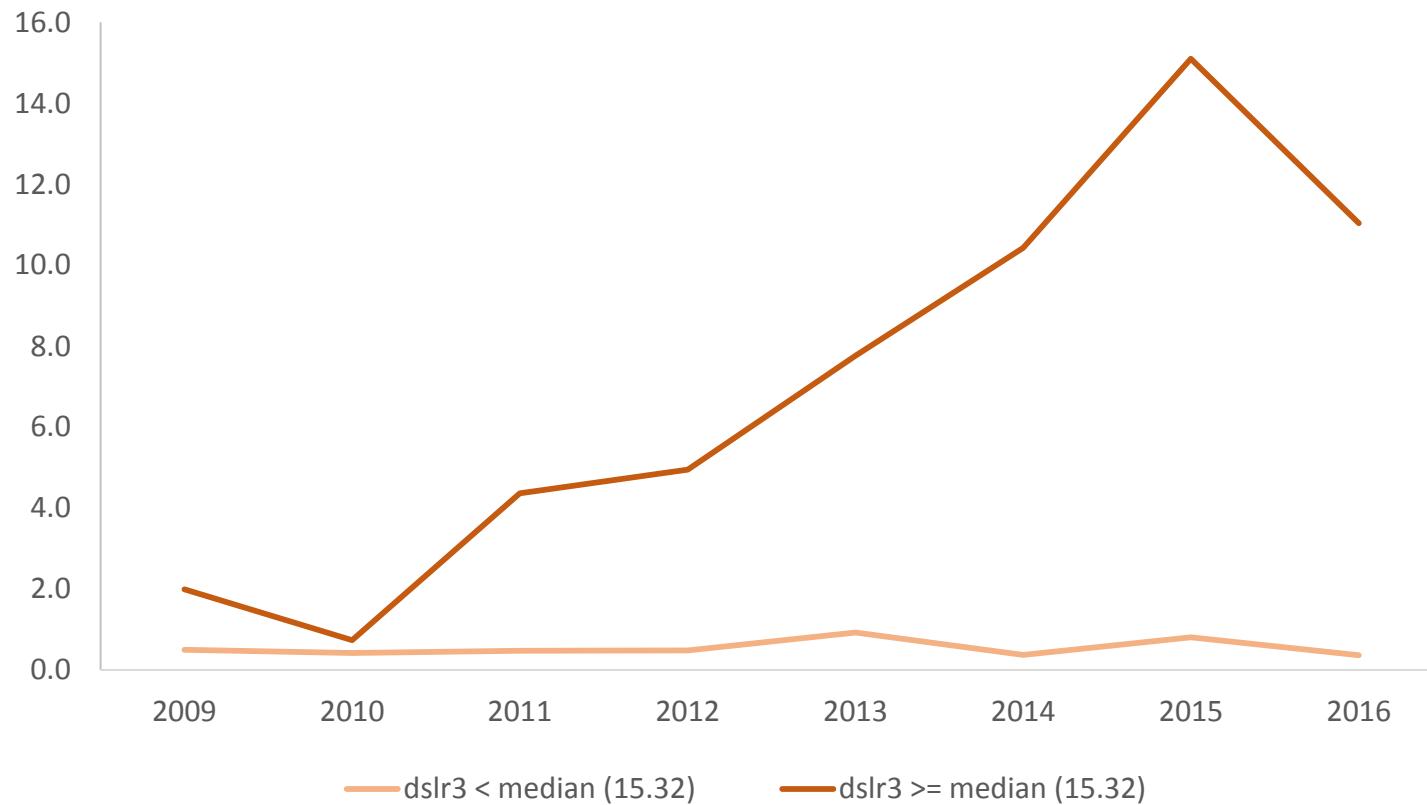
Share of estimated direct social loss (EDSL) in total contract value by year, 2009-2016, %, N = 138,743



Estimated direct social loss (EDSL) by year, 2009-2016, Billion HUF, N = 138,743



Testing the estimation of EDSL by FDT (MSE) 2009-2016, N = 138,743



An extremely sensitive issue:

BUILDING
a
KLEPTOCRATIC STATE

Kleptocratic / predatory state

A concept from the political economy:

Rose-Ackerman, 1999; Charap & Harm, 1999; Lambsdorff, 2007;

- Rent-seeking
- Systemic corruption
- Political favouritism: in favour of the dictator's cronies and family members
- Centralized decision making

Kleptocratic / predatory state

- Discriminative regulation of entry / exit
 - New markets only for the cronies (monopolistic positions, rents)
 - Displacement / expulsion of unwanted actors
- Discriminative taxation (only in favour of cronies)
- Discriminative lending policy of state owned banks or banks owned by cronies
- **Discriminative decisions at public procurement**

Aim of this research direction

- Detect the activity of KS at PP
- Measure its weight and analyse the mechanism
- Identify its effects on the intensity of competition
- Analysis the role of EU funding

The MGTSH Group

- The owners of the MGTSH companies:
 - Mészáros, Lőrinc
 - Garacsi, István
 - Tiborcz, István
 - Simicska, Lajos
 - Habony, Árpád

Mészáros, Lőrincz

- A close childhood friend of the Hungarian Prime Minister; a gas fitter; the mayor of Felcsút (the village where Viktor Orbán spent his childhood); since 2013 a Hungarian billionaire;



Garancsi, István

- A Hungarian businessman, owner of the Videoton FC football team, president of the Hungarian Association of Hikers, close friend of Viktor Orbán;



Tiborcz, István

- Hungarian lawyer, entrepreneur; husband of Viktor Orbán's oldest daughter.



Simicska, Lajos

- Hungarian businessman, former President of one of the Hungarian TV channels (Hír TV); Hungary's 11th richest person; Viktor Orbán's dormitory roommate. Later he held several positions: the treasurer of Fidesz, President of Hungarian Tax Office, general manager and CEO of Mahir . He broke up with Viktor Orbán on Febrary 6th 2015.

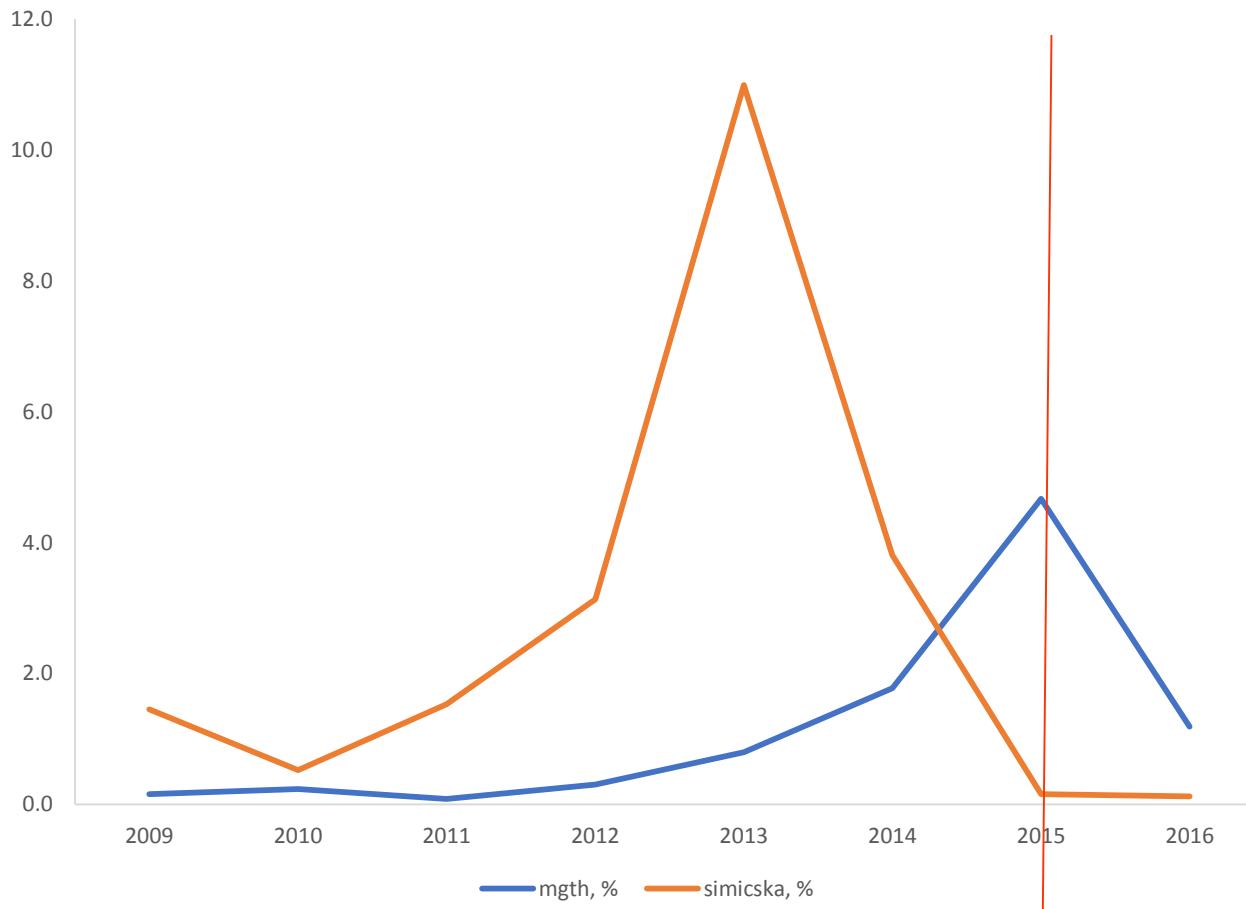


Habony, Árpád

- Hungarian entrepreneur, political advisor, Hungarian kendo champion, Viktor Orbán's personal strategic consultant.

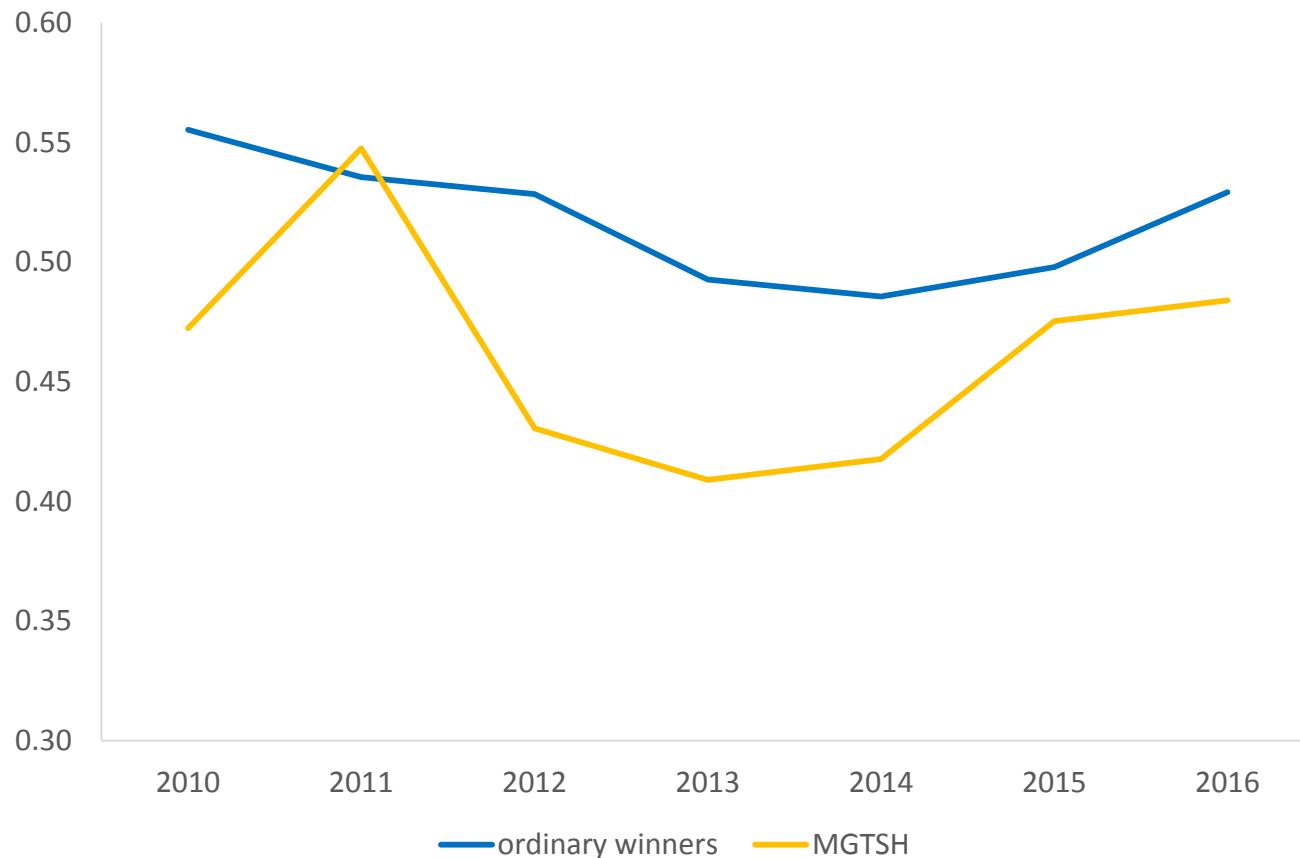


The share of contract value of public tenders won by the MGTSH companies in total contact value by year, %, 2009-2016, N = 138,757



Note: without framework agreements

Intensity of competition (ICI) in tender won by MGTSH companies and ordinary winners, 2009-16, N = 101,130



Note: y axis: mean value of ICI by year; without framework agreements

Estimation of the effect of political favouritism on intensity of competition (ICI), ordered logit

Ordered logistic regression

Number of obs = 86675
 LR chi2(15) = 6779.78
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.0249

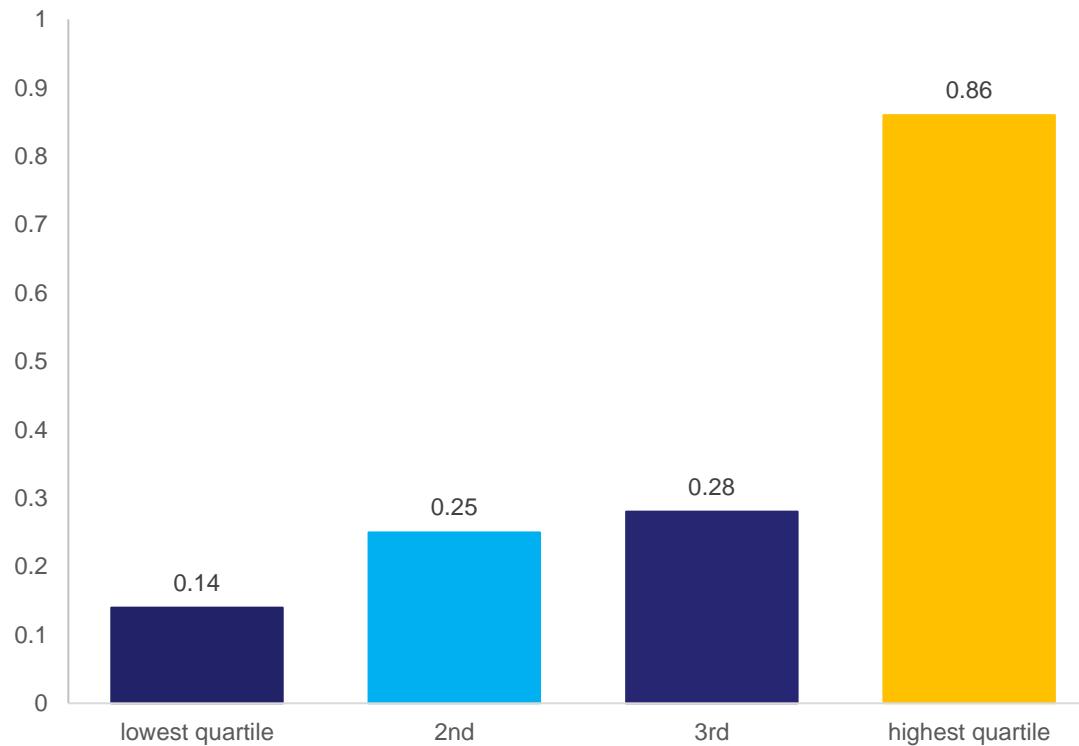
Log likelihood = -132830.96

	ici	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
	mgtsht	-.9936456	.1156512	-8.59	0.000	-1.220318 -.7669734
y2010	-.5860077	.0262069	-22.36	0.000	-.6373722	-.5346432
y2011	-.3152486	.0261676	-12.05	0.000	-.366536	-.2639611
y2012	-.3758083	.0263068	-14.29	0.000	-.4273687	-.3242478
y2013	-.4602623	.0238919	-19.26	0.000	-.5070896	-.4134351
y2014	-.4597194	.0238998	-19.24	0.000	-.5065621	-.4128768
y2015	-.3887703	.0238913	-16.27	0.000	-.4355965	-.3419442
s1	-.1446476	.0204061	-7.09	0.000	-.1846428	-.1046525
s2	.5469023	.0204571	26.73	0.000	.5068071	.5869975
s3	.1436362	.0372514	3.86	0.000	.0706248	.2166476
s4	.2575202	.0267176	9.64	0.000	.2051548	.3098857
s5	.5682887	.0265746	21.38	0.000	.5162035	.6203738
lnncv	.0186915	.0036722	5.09	0.000	.0114941	.0258889
eu	-.1815272	.0137939	-13.16	0.000	-.2085627	-.1544917
ti	.9637081	.0146847	65.63	0.000	.9349267	.9924896

Estimation of the effect of political favouritism on intensity of competition (ICI), OLS

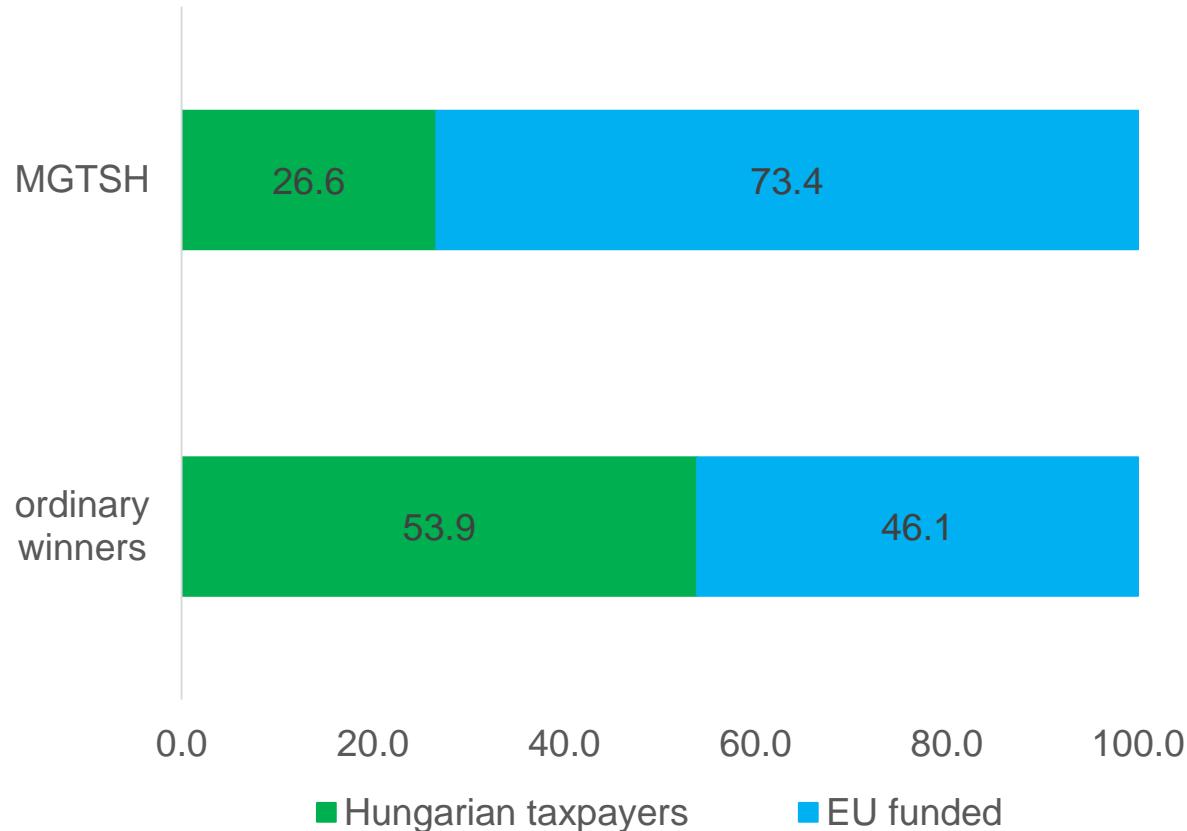
Source	SS	df	MS	Number of obs = 86675		
Model	285.138659	15	19.0092439	F(15, 86659) = 602.30		
Residual	2735.05893	86659	.031561164	Prob > F = 0.0000		
Total	3020.19758	86674	.034845485	R-squared = 0.0944		
				Adj R-squared = 0.0943		
				Root MSE = .17765		
ici	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
mgtsh	-.0933375	.0107826	-8.66	0.000	-.1144713	-.0722038
y2010	-.0460688	.0024881	-18.52	0.000	-.0509454	-.0411922
y2011	-.0175897	.0025429	-6.92	0.000	-.0225737	-.0126057
y2012	-.027123	.0025621	-10.59	0.000	-.0321448	-.0221013
y2013	-.0373716	.0023328	-16.02	0.000	-.0419439	-.0327993
y2014	-.0382332	.0023409	-16.33	0.000	-.0428213	-.0336452
y2015	-.0326208	.0023442	-13.92	0.000	-.0372154	-.0280261
s1	-.0135093	.0019304	-7.00	0.000	-.0172929	-.0097257
s2	.0511257	.0019816	25.80	0.000	.0472418	.0550096
s3	.0071979	.0036997	1.95	0.052	-.0000536	.0144494
s4	.0221083	.0026138	8.46	0.000	.0169853	.0272314
s5	.0551806	.002596	21.26	0.000	.0500924	.0602688
lnncv	.0011237	.0003452	3.25	0.001	.0004471	.0018004
eu	-.0222085	.0013448	-16.51	0.000	-.0248442	-.0195728
ti	.1080571	.0013599	79.46	0.000	.1053918	.1107224
_cons	.4499494	.0060279	74.64	0.000	.4381349	.461764

The MGTSH group and the size of public tenders: The share of public tenders won by MGTSH firms by quartiles



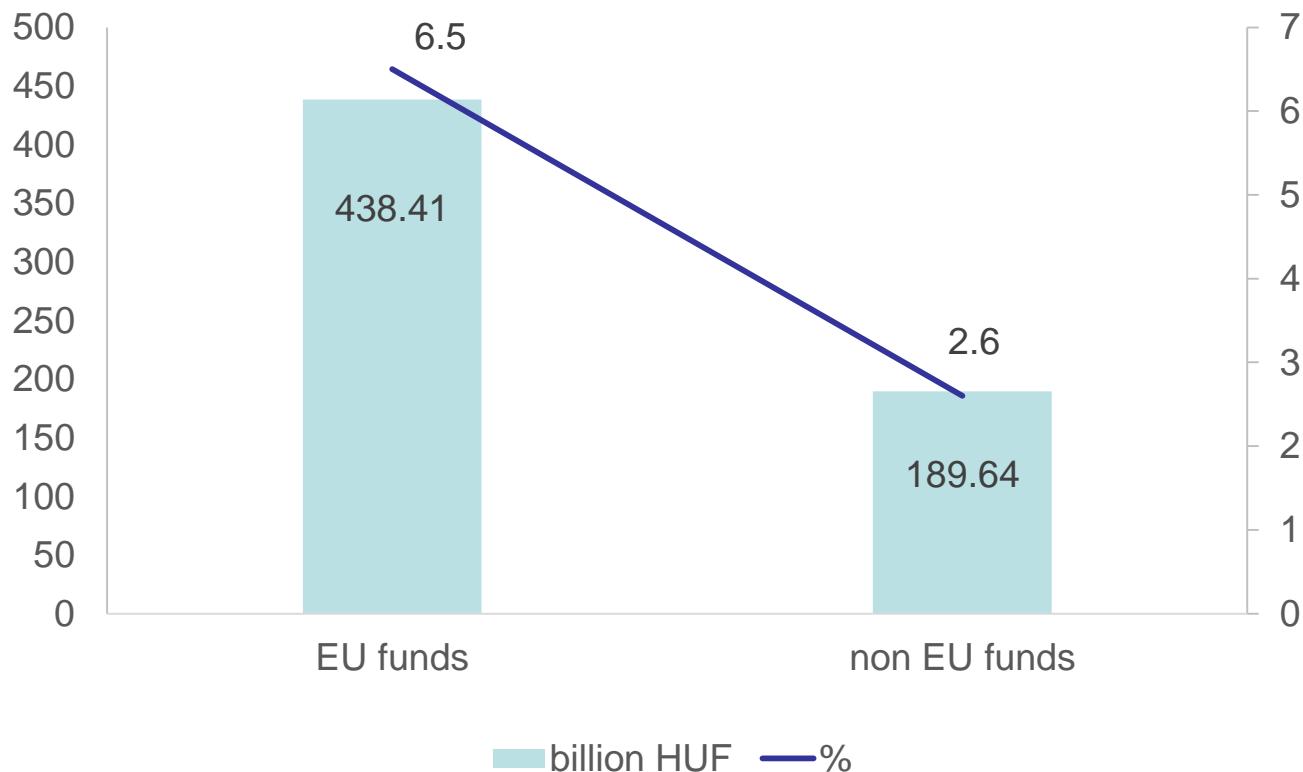
Note: without framework agreements

Value of EU funded and Hungarian funded projects in total contract value by group of winners in Hungarian PP, 2010-16, %, N = 150,956



Note: with framework agreements

The share and weight of contact value of tenders won by MGTSH firms in all tenders by EU funding, 2009-16, N = 138,757



Note: without framework agreements

SUMMARY



In the period of 2009-2016 the Hungarian public tenders are characterised by

- Decreasing intensity of competition
- Growing level of corruption risks
- Strengthening of price distortion (overpricing)
- In 2016 there were some positive tendencies

- The weight of estimated direct social loss (EDSL) due to corruption and low level intensity of competition is
 - cca. 10-17% of total contract value and exceeded at least 1,800-2,300 billion HUF (5.8-7.5 billion Euros)

- The EU funding has perverse effects in Hungary
 - reduces intensity of competition
 - increases corruption risk and
 - increases the weight of price distortion
 - fuels the building of political favouritism (& kleptocratic state)

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