

# Cronyism in Hungary

## *Empirical analysis of public tenders 2010-2016*

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### Abstract

In this paper, we use the public procurement database built by CRCB, which contains data from more than 230,000 public tenders from 1997 to 2017. The analysis is based on data from 126,330 public procurement contracts from 2010 to 2016. The focus of the analysis is public tenders (without framework agreements) won by companies related to cronies and family members of Hungarian Prime Minister Viktor Orbán: Lőrincz Mészáros, István Garancsi, István Tiborcz and Lajos Simicska (we will refer to this group with the abbreviation MGTS). During the analysis, we make a statistical comparison of the corruption risks, intensity of competition and the strength of price competition among tenders won by crony companies and that among tenders won by other, ordinary Hungarian firms. We use indicators as a dummy variable of single bidder to measure corruption risks, index of intensity of competition and the relative price drop, RPRD to measure of strength of competition. Our results point out the existence of political favouritism in Hungarian public procurement during the period under examination. The corruption risk is significantly higher and the intensity of competition is significantly lower in tenders won by MGTS firms than other tenders won by ordinary Hungarian companies and the median RPRD values of tenders won by MGST firms are very close to the median value of tenders with the highest corruption risks and lowest intensity of competition.

Keywords: cronyism, corruption, public procurement, empirical analysis, Hungary

JEL classification: D22, D72, D73, H57, P16

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## 1 Introduction

This paper is going to present empirical evidences about the existence of the cronyism in Hungary that has been built since 2010 within the framework of Viktor Orbán's autocratic regime. János Kornai thoroughly discussed the autocratic characteristics of the Hungarian state administration (Kornai, 2016). He highlighted that the Orbán-government fulfils the minimum conditions for autocracy: it cannot be voted out by the usual democratic methods, as there was a broad set of measures ensuring the victory of Fidesz on the elections, also the government introduced its own 'checks and balances' and in addition, the leading positions are filled up with trustworthy people. He also forewarns that there are signs of hardening autocracy, however, the present situation should not be considered as dictatorship yet, as there is no one-party system and terror – or repression – in Hungary. Kornai also described the peculiar nature of the Hungarian 'autocratic capitalism': the aim of the regime is not to end the dominance of the private ownership; what it really wants is to strengthen the position of political power holders in the business realm. The way in which this is realized is not the abolishing of the market, but simply the intervention in the market coordination for selfish financial gain – the present study is going to show up an example for such interference from the domain of public procurement in the period of time 2010-2016. In this paper first we deal with a literature review than we present the data used and the indicators which measure the corruption risks, intensity of competition and price competition. After that we show basic statistics of these indicator during the analysed period and we present the models and the results of estimation. In the final part we deal with the conclusions briefly.

## 2 Literature

The important paper on this domain was published by Sergei Guriev and Daniel Treisman draw attention to the new characteristics of the modern authoritarian systems: instead of relying on mass terror, violence to frighten opponents and indoctrination, a new, less fierce form of the authoritarian governing emerged adapted to the globalized media and the recent technologies (Guriev and Treisman, 2015). Such regimes pretend to be democratic by holding elections but with influencing the results, allowing the private press to work but with corrupting the media and also, they tend to follow and spread an anti-Western creed. An important tool of the new totalitarian leaders is the propaganda, what they use for convince the citizens about their competences to govern. They rely more on manipulating the beliefs about the world instead terrorizing victims – the political opponents are strongly encouraged to emigrate. The authors conclude that until there is no major economic crisis what reveals the incompetence of leader, the authoritarian system can be maintained. Finally, what is very important from the perspective of our study, is that the Hungarian regime of Viktor Orbán is one of the examples of the authors for modern dictatorships.

In order to be able to contextualize our results, we also have to review the conceptualizations from the field of corruption research which we followed during our work. Corruption, albeit it is basically a micro-phenomenon, now is considered as an umbrella term and is used to refer to 'grand corruption' (Rose-Ackerman, 1978; Lambsdorff, 2007). Thereby the notion of corruption covers the concepts of rent-seeking, state capture, cronyism and kleptocratic state which are some of its distinct

manifestations; the presence of corruption leads to limited competition, overpricing and therefore to social losses.

Rent-seeking is understood as the activity of a group of economic actors to achieve an exceptional situation what surely leads to social losses (Murphy, Shleifer and Vishny, 1993). The state capture can throw up through rent-seeking: when citizens or groups of companies can achieve that the government or the state institutions create laws and rules that are favourable to them – the state becomes captured by narrow interest groups and regulates economic processes in accordance with their interests (Rose-Ackerman, 1999). Rent-seeking may also result in cronyism, when the state allocates its resources to the individuals and groups closely related to its leader or in extreme cases to the dictator (Haber, 2002). The extreme case of the cronyism is when the resources of the country are no longer distributed to the cronies selected by the political leader, but par excellence the political leaders, their strawmen and their families will be the beneficiaries – the state then becomes an extortionary or kleptocratic state (Rose-Ackerman, 1999). In such cases, the political leader treats the companies of the private sector as their own; if he sees a very successful company, he raises the possibility of "getting involved" - by forcing the entrepreneur to pass the ownership. In extreme cases, tax revenues are spent indirectly on his own fun (e.g. construction of football stadiums); or he or his friends indirectly acquire shares in state-owned companies, whose profits are then attributed to his family's businesses. Sometimes he helps to introduce a law that enables to trade with residence bonds and thereby with citizenship, however, the revenues of this business do not go to the state budget but to the account of offshore companies (Rose-Ackerman, 1999; CRCB, 2015: 75–82). Public procurement is another commonly used channel for the transfer of tax revenue to family members and/or cronies. The functioning of the cronyism were mostly analysed based on examples from Africa, Asia and South America (Harm and Charap, 1999; Haber, 2002; Kang, 2002; Diwan, Keefer and Schiffbauer, 2015; Nucifora, Churchill and Rijkers, 2015; Rijkers, Freund and Nucifora, 2017). We are going to discuss it through the Hungarian case.

### 3 Data and Indicators

In this paper we use the public procurement database built by the CRCB and take into consideration procurement between 2010 and 2016; the following analysis is based on data from 126,330 public procurement contracts (see Figure 1 and Figure 2).

(Figure 1 here)

(Figure 2 here)

The focus of the analysis is public procurement (not including framework agreements) won by companies tied to cronies and family members of Hungarian Prime Minister Viktor Orbán: Lőrincz Mészáros, István Garancsi, István Tiborcz and Lajos Simicska (we will refer to this group with the abbreviation MGTS, see the Annex for more detailed information). During the period under examination, they won 510 contracts and Hungarian public institutions spent \$49.3 billion on public procurement, of which MGTS companies received \$2.5 billion, thus accounting for 5.1% of the total value of public procurement (see Figure 2 for the aggregated net contract values in the Hungarian public procurement per year). Between 2010 and 2016, this percentage significantly changed by year (see Table 1 and Figure 3 and 4).

Table 1. The share of the value of procurement won by MGTS companies of the total value of public procurement, 2010–2016, N=126,330

|      | %    |
|------|------|
| 2010 | 0.8  |
| 2011 | 1.6  |
| 2012 | 3.4  |
| 2013 | 11.8 |
| 2014 | 5.6  |
| 2015 | 4.8  |
| 2016 | 1.3  |

Note: tenders without framework agreements  
 Source: CRCB

(Figure 3 here)

(Figure 4 here)

Three indicators will be used in order to investigate the strength of the competition during the tenders. The first indicator refers to the existence of competition: the occurrence of single-bidder contracts, what is an important indicator of corruption risks or in other terms, of the conditions facilitating corruption. Several studies consider it as an objective indicator of corruption risk (e.g. Coviello & Gagliarducci, 2010; Fazekas et al. 2013b; Fazekas et al. 2016; Tóth – Hajdu, 2016a).

For measuring the prevalence of single-bidder contract we constructed an indicator called Single-bidder (SB) using the following rule:

*SB = 1 if the tender was conducted with only one bid*

*SB = 0 if there were more than one bid.*

The second indicator we take into account in the present study is also related to the number of bids (NB). It measures the intensity of competition (Index of Competition Intensity)<sup>1</sup>. This indicator has missing value if NB= 1, because we assume that if there is only one bid, then there was no competition that could be measured – such cases are analysed by the single-bidder indicator presented in the previous paragraphs. We calculate the ICI with the following formula:

$$\begin{aligned}
 ICI &= \frac{\lg NB}{\lg 10} && \text{if } 1 < NB \leq 10 \text{ and,} && (1) \\
 ICI &= 1 && \text{if } 10 < NB.
 \end{aligned}$$

Finally, as for our third indicator, to measure the strength of price competition, we compare the estimated value of contracts with the final contract value. The estimated value is determined by the issuer and indicates the highest price that was estimated based on a market analysis for a particular product, and sometimes it could also signal how much money was available to implement the project. First, we calculated the difference between the estimated value and the final contract value,

<sup>1</sup> See: CRCB, 2016 and Tóth & Hajdu 2016a.

then we divided it by the contract value, and finally we multiplied these results by 100. We can thereby analyse the percentage rate of decline in the estimated value as a percentage, the relative price drop (RPRD). We calculate it in the following way:

$$RPRD = \frac{(P^* - P)}{P} * 100 \quad (2)$$

if  $P^* > P$  and  $RPRD < 100$

*(cases in which  $RPRD \geq 100$  were excluded from the calculations because we assume that they are affected by data inconsistencies)*

*where  $P^*$  is the estimated net value and  $P$  is the net contract value.*

The  $P^*$  (the estimated net value) is determined by experts for the issuers. If they act in accordance with Hungarian regulations, they indicate the maximum market price known to them or the value obtained based on preliminary market research, or, if they do not follow the official rules, it simply corresponds to how much funding is available for the project or how much money they could negotiate with ministries or state institutions that deal with managing EU funds.  $P$  is the net price given by the successful tenderer (the net contract price). If  $RPRD=0$  or its value is close to zero, then this means that the public procurement contract was basically concluded at the estimated value. This happens when the final winner knew the estimated value in advance, and he was informed in advance that there would be no competition or that the 'competing' companies were predictably 'loser companies': they had only submitted a tender to cover for the crony company. It is the issuer or predetermined winner that arranges for the 'loser companies' to submit a tender.

According to an internationally accepted interpretation, if contract prices are close to the estimated value, then this should be interpreted as a 'red flag', a sign of possible corruption (<http://bit.ly/2n1shZp>).

The RPRD thus characterizes the price competition for a single public procurement: the higher value indicates more intense competition and cheaper public procurement, a lower magnitude of overpricing and thereby a lower rate of corruption rents (<http://bit.ly/2prJVsW>), and the lower value shows the higher level of corruption risks and lower level of intensity of competition. During the period under examination, MGTS companies concluded 330 construction contracts as individual tenderers or consortium members with a total value of HUF 564 billion, which amounted to 9.6% of the total value of all construction contracts, excluding framework agreements.

## 4 Intensity of competition and corruption risks

The first indicator suggests that ratio of contracts with no competition within the tenders won by the MGTS companies were far higher than in the case of procurements won by other firms between 2010 and 2015. In 2016, the situation changed – the tenders related to the MGTS group were conducted in a more favourable environment from this point of view (see Figure 5).

(Figure 5 here)

As for the intensity of competition indicator, similar consequences can be drawn. We can see, that the MGTS companies could win the tenders within less competitive circumstances during the analysed period except for 2011 (see Figure 6).

(Figure 6 here)

However, an interesting phenomenon can be observed if we distinguish between the MGT and the S companies: after Viktor Orbán and Lajos Simicska broke up in 2015, Simicska's companies began to face with intense competition on the tenders (see Figure 7). The RPRD indicator also suggests that the competition during those tenders which are won by the MGTS companies is more limited than in the cases of the procurement with other winners, but the year of 2013 was an exception (see Figure 8).

(Figure 7 here)

(Figure 8 here)

## RPRD

Figure 9 compares the RPRD values in construction contracts won by MGTS companies, two multinational companies (Strabag and Swietelsky) and simple (non-crony) Hungarian companies between 2010 and 2016 (a total of 20,740 contracts).

(Figure 9 here)

The figure shows the median values of the relative price drop (RPRD) in the different groups of tenders. The ideal case is public procurement with zero corruption risks and strong competition (at least six competitors; 1,182 such tenders were found): in such cases, the median price drop was 21%. Thus, in the case of public procurement conducted within ideal circumstances – with strong market competition – contract prices are typically 21% lower than the estimated value. In such cases, there is no social loss as public procurement prices are set after strong market competition and a minimum risk of corruption. Under less stringent conditions (at least four bidders and less than the maximum risks of corruption), the median price drop was 8.4% (5,032 such tenders were found). The other extreme case is when there was no competition (only one bidder submitted an offer) and the corruption risks reached the highest possible level (we measure this with a corruption risk indicator, which has a minimum value of zero and a maximum value of one). In such cases (533 tenders), the final contract prices practically matched the price previously estimated by the contracting authority. Prices did not fall because the winner, the crony, understood there would be no competition, knew in advance that he was guaranteed to win, and thus indicated the estimated value as the bid price. Thereby, the social loss is maximized: contract prices contain huge corruption rents as they have been set without competition. Values related to the other three groups of tenders speak for

themselves: if Strabag or Swietelsky won alone, then the price drop was the closest to tenders with strong market competition (5.8%). By contrast, in the case of public procurement won by MGTS companies, the contract prices practically equalled the estimated value. These tenders (107 such tenders) were characterized by a 0.5% price drop rate. Therefore, as with tenders with high corruption risks and no competition, prices for tenders won by MGTS companies exceeded real market prices and thereby resulted in a maximum social loss.

According to an article in The Wall Street Journal from 12th January 2018, the European Union's antifraud office (OLAF) discovered 'serious irregularities' in projects carried out by Elios Innovative S.A.<sup>2</sup> in 2015–2016. At that time, that company was owned by István Tiborcz, Hungarian Prime Minister Viktor Orbán's son-in-law, one of the members of MGTS group. Tiborcz is one of the most important figures in Hungary's new emerging elite (see Annex).

As economic researchers engaged in analysing corrupt behaviour among the actors in public procurement and in measuring corruption risks and the intensity of competition in public tenders, we can contribute important information toward full disclosure of this case. Using indicator of the relative price drop (RPRD) we calculated its value in tenders won by every member of the MGTS group. We used a total of 69,010 tenders, including 253 tenders won by MGTS firms, for this analysis. Thus, we calculated this indicator separately for tenders won by Mészáros, Garancsi, Tiborcz and Simicska (see Figure 10).

(Figure 10 here)

In this figure, we can see that while the median RPRD value was 0.9% for tenders won by companies in the MGTS group in 2010–2016, the median RPRD value was 5.9% for tenders won by business organisations owned by István Garancsi (18 tenders), 1.4% for tenders won by Lajos Simicska's businesses (146 tenders), only 0.1% (!) for tenders won by Lőrinc Mészáros' firms (26 tenders), and, finally, only 0.7% (!) for tenders won by Istvan Tiborcz's concerns (63 tenders). We must add another important result: with the calculation by the CRCB, the value of the RPRD was 27.4% for tenders with a minimum level of corruption risks and a high level of competition (these are tenders with more than six bidders), while it was only 0.5% (!) for non-competitive tenders with a maximum level of corruption risks. These results may provide information on the possible magnitude of rent created by corruption as well.

## 5 Models and Estimations

The present part of the study is going to show some results based on regression models which allow us to investigate the effect of the MGTS companies on the corruption risks and the intensity of competition during the public procurement. By the application of the regression analyses we can take into consideration several control variables which may be related to whether the winner was an MGTS company or not. Thereby we can remove the effects of these control variables from the effect of the MGTS companies on the aforementioned indicators.

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<sup>2</sup> See <http://on.wsj.com/2FyEIDI>

The estimations were conducted by applying the propensity score matching (PSM) method. This enables us to compare the contracts that were arranged within public procurements won by MGTS companies and won by other companies with reducing the bias due to confounding variables or selection bias. By considering these confounding variables, we can compare more homogeneous subgroups of contracts distinguished based on whether the winner belongs to the MGTS companies or not. The variables that were selected on this purpose are the following:

- Sector of the public procurement (whether it belongs to the construction or not)
- EU funding
- The natural logarithm of the net contract value
- Year of the procurement

And we estimate the following equations:

$$SB = f(MGTS, S, EU, LNCV, Y)$$

$$ICI = f(MGTS, S, EU, LNCV, Y)$$

$$RPRD = f(MGTS, S, EU, LNCV, Y)$$

- where the estimated indicators are the indicators of corruption risks (SB), the intensity of competition (ICI) and the relative price drop (RPRD)
- The MGTS is a dummy variable which has value one if the tender won by the MGTS companies and has value zero if the tender won by other ordinary Hungarian companies.
- S is a variable of the industrial sector
- EU is a dummy variable which has value one if the tender financed by EU funds, and zero, if it is financed by domestic sources
- LNCV is the logarithm of the net contract value and
- Y is the year of the given contract.

We suppose that in the case of regression models there would a selection bias as the MGTS companies apply for tenders with favourable conditions for corruption and weak competition on purpose. They choose tenders with high contract values and with EU-funding in order exploit the economies of scale (taking consideration the fix cost of creation of conditions favourable to corruption) that can be achieved, in particular with applying for bigger tenders. Thereby the creation of circumstances that are needed for corruption has to be repeated less times (for a deeper discussion of this phenomenon on the field of communication procurement, see Tóth & Hajdu 2017b). Also, there are some evidences proofing that the leaders of the MGTS companies may had affected how the public procurement they applied for were conducted. For instance, the companies related to Lajos Simicska won plenty of tenders issued by the Hungarian Roads Nonprofit Plc. (Magyar Közút Nonprofit Zrt.) when it was led by Attila Mázsi who was considered as Lajos Simicska's man<sup>3</sup>.

The outputs of the analyses can be found in the Annex, here we only discuss the main results. As it is shown in Table 2, the significant positive effect of the MGTS companies on the restriction of

<sup>3</sup> <https://vs.hu/kozelet/simicska/a-szamokon-is-latszik-a-simicska-orban-haboru-0211#!s1>  
<http://www.borsonline.hu/aktualis/levadasszak-simicska-katonait/100212>



competition and on the extension of corruption risks can be traced in the case of the SB, our robust corruption risk indicator what is signed by the significant positive coefficient. The significant negative coefficient in the case of the ICI indicator indicates that the MGTS companies won the tenders after significantly weaker competition than the other companies did comparing homogenous subgroups of contracts. These results mean that the MGTS companies win their tenders within significantly higher corruption risks and significantly weaker competition.

The RPRD what is in correlation with the SB and the ICI is also significantly lower within the group of the tenders won by the MGTS companies. This suggests that corruption rent for the MGTS companies is above the average. However, the results concerning the RPRD suggest a new direction for our research, as the estimated values for the contracts may be manipulated and also there is a considerable amount of lack of data regarding this characteristic. The correct values of the RPRD indicator in the suspicious cases may be estimated based on the data from tenders with low corruption risks and high-level competition.

Table 2. The effects of MGTS companies on the investigated indicators, 2010–2016

| Indicator                            | Coefficient of MGTS |
|--------------------------------------|---------------------|
| Single bidder (SB)                   | 0.190***            |
| Index of competition intensity (ICI) | -0.067***           |
| Relative price drop (RPRD)           | -2,526*             |

\*\*\*: p < 0.01  
 \*\*: p < 0.05  
 \*: p < 0.10

## 6 Discussion and Conclusions

Our results support that crony system and the kleptocratic state is operating on the field of the public procurement in Hungary what can be traced by several well-grounded indicators. What does this say about the future of the Hungarian economy? In the short term, the development and operation of cronyism may have no noticeable effects on the competitiveness of an economy. However, in the medium and long run, there will be severe consequences. Both theoretical and empirical economic research concludes that cronyism, fuelled by rent-seeking, can ultimately only gain ground through the destruction of the market economy, and, in the meantime, it results in a less efficient allocation of resources. Societies based on rent-seeking and corruption become uncompetitive and fall behind developed market economies in the long term (see Murphy et al., 1993, Acemoglu and Robinson, 2012).

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## Annex

### A1. Main statistics of the public tenders analysed

Table A1: Summary of the main figures

| filter     | indicator  | 2010     | 2011     | 2012     | 2013     | 2014     | 2015     | 2016     |
|------------|--|----------|----------|----------|----------|----------|----------|----------|
|            | Total number of contracts                          | 27528    | 16864    | 17098    | 24315    | 25485    | 25298    | 17949    |
| goodx==1   | Total number of contracts                          | 21192    | 15078    | 15118    | 21944    | 23119    | 23029    | 15729    |
| goodfwc==1 | Total number of contracts                          | 20472    | 14517    | 14043    | 20725    | 21519    | 20936    | 14118    |
| goodfwc==1 | Total value of contracts (billion Ft)              | 1435.883 | 683.2144 | 1391.982 | 2474.073 | 2163.849 | 1749.454 | 1765.743 |
| goodfwc==1 | Total number of EU-funded contracts                | 7625     | 6223     | 5376     | 8849     | 9242     | 8083     | 1170     |
| goodfwc==1 | Total value of EU-funded contracts (billion Ft)    | 746.696  | 375.283  | 695.046  | 1356.255 | 1006.281 | 608.359  | 197.747  |
| goodfwc==1 | Total number of construction contracts             | 6104     | 5189     | 3904     | 5123     | 6284     | 5479     | 3664     |
| goodfwc==1 | Total value of construction contracts (billion Ft) | 765.879  | 388.462  | 671.601  | 1467.460 | 1046.295 | 683.237  | 874.904  |
| goodfwc==1 | Tl==1 number of contracts                          | 16422    | 6355     | 6858     | 9059     | 8185     | 8075     | 5725     |
| goodfwc==1 | Tl==1 value of contracts (billion Ft)              | 1128.506 | 477.52   | 1074.699 | 2072.793 | 1721.158 | 1250.596 | 1334.747 |
| goodfwc==1 | SB==1 number of contracts                          | 6853     | 3732     | 3665     | 5369     | 6863     | 6602     | 3774     |
| goodfwc==1 | SB==1 value of contracts (billion Ft)              | 465.031  | 193.638  | 508.089  | 717.259  | 839.380  | 613.412  | 535.174  |
| goodfwc==1 | CR3 átlag. goodfwc==1                              | 0.275    | 0.375    | 0.377    | 0.391    | 0.417    | 0.415    | 0.380    |
| goodfwc==1 | CR3==0 number of contracts                         | 8107     | 3483     | 3289     | 4587     | 3941     | 3833     | 2755     |
| goodfwc==1 | CR3==0 value of contracts (billion Ft)             | 549.598  | 229.175  | 508.682  | 1108.832 | 708.143  | 530.315  | 782.549  |
| goodfwc==1 | CR3==1 number of contracts                         | 781      | 806      | 625      | 957      | 1295     | 1285     | 588      |
| goodfwc==1 | CR3==1 value of contracts (billion Ft)             | 52.634   | 22.772   | 89.542   | 42.938   | 43.909   | 51.237   | 92.264   |

Table A2: Summary of the contracts won by the MGTS group

| filter     | indicator                               | 2010  | 2011   | 2012   | 2013    | 2014   | 2015   | 2016   |
|------------|---|-------|--------|--------|---------|--------|--------|--------|
| goodfwc==1 | MGTS==1 number of contracts             | 87    | 45     | 61     | 76      | 141    | 84     | 16     |
| goodfwc==1 | MGTS==1 value of contracts (billion Ft) | 11.0  | 11.0   | 47.8   | 291.7   | 120.8  | 84.4   | 23.3   |
| goodfwc==1 | M number of contracts                   | 1     | 1      | 8      | 2       | 11     | 14     | 6      |
| goodfwc==1 | M value of contracts (billion Ft)       | 0.001 | 0.486  | 3.219  | 0.046   | 26.391 | 27.424 | 0.531  |
| goodfwc==1 | G number of contracts                   | 4     | 1      | 1      | 4       | 10     | 25     | 5      |
| goodfwc==1 | G value of contracts (billion Ft)       | 2.855 | 0.025  | 0.898  | 19.317  | 8.541  | 46.280 | 13.072 |
| goodfwc==1 | T number of contracts                   | 2     | 2      | 9      | 5       | 27     | 28     | 3      |
| goodfwc==1 | T value of contracts (billion Ft)       | 0.567 | 0.048  | 0.095  | 0.364   | 3.436  | 7.989  | 7.528  |
| goodfwc==1 | S number of contracts                   | 80    | 41     | 43     | 65      | 93     | 17     | 2      |
| goodfwc==1 | S value of contracts (billion Ft)       | 7.565 | 10.464 | 43.629 | 271.996 | 82.439 | 2.701  | 2.184  |

Table A3: Summary of the NB, ICI and RPRD indicators

| Number of contracts with the given number of bidders | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|--|------|------|------|------|------|------|------|
| 1  | 6853 | 3732 | 3665 | 5369 | 6863 | 6602 | 3774 |
| 2  | 4218 | 3194 | 3044 | 4803 | 4559 | 4323 | 2748 |
| 3  | 3614 | 3853 | 4141 | 6967 | 6755 | 6537 | 3137 |
| 4  | 1843 | 1140 | 1098 | 1372 | 1400 | 1498 | 2630 |
| 5  | 1004 | 650  | 556  | 693  | 747  | 734  | 632  |
| 6 or more  | 2256 | 1569 | 1402 | 1485 | 1181 | 1236 | 1189 |
| ICI average  | 0.59 | 0.51 | 0.50 | 0.48 | 0.48 | 0.48 | 0.52 |
| RPRD2 median   | 9.9  | 5.3  | 3.3  | 1.6  | 1.3  | 1.7  | 2.4  |

## A2. The players: members of the MGTS group

Lőrincz Mészáros

A close childhood friend of the Hungarian Prime Minister; a gas fitter; the mayor of Felcsút (the village where Viktor Orbán spent his childhood). A Hungarian billionaire since 2013 (<http://bit.ly/1nKficQ>). Many experts assume that he serves as a front (straw man) for Viktor Orbán's business dealings (<http://on.ft.com/2BSL2qp> and <http://bit.ly/2Dy7R09>). While he was an ordinary citizen without any considerable wealth in 2009, according to estimates by Forbes Hungary in 2017, his wealth had reached \$392 million (<http://bit.ly/2DBEeLq>, <http://bit.ly/2DAnk05>, <http://bit.ly/2E7pEMZ> and <http://bit.ly/2GeKF97>).

Istvan Garancsi

Hungarian businessman, owner of the Videoton FC football team, president of the Hungarian Association of Hikers; close friend of Viktor Orbán's (<http://bit.ly/2DIKt3p>). Many assume that he serves as a front for Viktor Orbán's business dealings (<http://bit.ly/2DMlprv> and <http://bit.ly/2Bs57jc>).

István Tiborcz

Hungarian lawyer and businessman; son-in-law of Viktor Orbán, Hungary's prime minister (<http://bit.ly/2DxhgoN>).

Lajos Simicska

Hungarian businessman, owner of Hungarian TV news channel *Hír TV* and one of Hungary's leading dailies, *Magyar Nemzet*; Hungary's 11<sup>th</sup> richest person estimated by napi.hu on its list of the 100 richest Hungarians; Viktor Orbán's dormitory roommate. Later, he held several positions: Fidesz treasurer, President of the Hungarian Tax Office, and general manager and CEO of Mahir, one of the market leaders in advertising in Hungary. He fell out with Viktor Orbán on 6<sup>th</sup> February 2015 (<http://politi.co/2rBxFap> and <http://bit.ly/2dY2TA4>).

### A3. Definition of variables used

|    | Variable names | Definition   |
|----|----------------|--|
| 1  | GOODFWC        | Filter variable [0,1];   |
| 2  | GOODFWC        | Filter variable [0,1]; it drops the framework agreements from the analysis – useful for analysing the contract values as the cases of framework agreements may bias the results  |
| 3  | DATE_          | Date variable for monthly data;  |
| 4  | DATEY          | Date variable for yearly data;   |
| 5  | EU             | Tender is funded by the EU [0,1];<br>If the tender was funded by EU, EU=1<br>else, EU=0  |
| 6  | NCVALUE        | Net contract price (in HUF)  |
| 7  | LNNCV          | Logarithm of net contract price  |
| 8  | ICI            | Index of Competition Intensity [ $0.3 \leq ICI \leq 1$ ]; It measures the intensity of competition: low value means low intensity, high value means high intensity. X: the number of bidders in a tender. $ICI = \lg X / \lg 10$ in case where $2 \leq X \leq 10$ , and $ICI = 1$ if $X > 10$ . $ICI = 99$ if $X = 1$ ; $ICI = 99$ if X value is missing; If $ICI = 99$ , this is a missing value. |
| 9  | SECTOR6        | Product market [1,2,3,4,5,6] of tenders; the information came from cpv codes published in tender documentation; The values are: 1 “Industrial goods” 2 “Construction works and services” 3 “IT works and services”, 4 “Real estate and business services”, and 5 “Engineering, R&D and financial services”, 6 “Other services”.  |
| 10 | SB             | Single bidder [0,1]; the value of 0 means there were more than one bids; the value of 1 means there was only one bid.  |
| 11 | CR2            | Corruption Risk Indicator [0, 0.5, 1]; The value of 0 means low corruption risk (more than one bids and tender with announcement), the value of 1 means high corruption risk (only one bid and tender without announcement). The formula of CR” is the following:<br>$CR2 = \frac{(1-TI)+SB}{2}$   |
| 12 | ROUND4         | If the contract price is divisible by $10^4$ without remainder (rounded at thousands), ROUND4 = 1<br>If the contract price is not divisible by $10^4$ without remainder, ROUND4 = 0,   |
| 13 | ROUNDRO        | [1,2,3,4] Recoded version of (ROUNR2):<br>ROUNDRO (1): ROUND (0.25),<br>ROUNDRO (2): ROUND (0.50), e.t.c.  |



|    |      |  |
|----|------|--|
| 14 | CR3  | <p>Corruption Risk Indicator [0, 0.33, 0.66, 1]; The value of 0 means low corruption risk (more than one bidder, tender with announcement, and not rounded price), the value of 1 means high corruption risk (only one bidder, tender without announcement and rounded price).</p> <p>We constructed the CR3 using the following formula:</p> <p>If CR2=0 &amp; ROUND4 =0 THEN CR3 =0</p> <p>If CR2=0 &amp; ROUND4 =1 THEN CR3=0.33</p> <p>If CR2=0.5 &amp; ROUND4 =0 THEN CR3=0.33</p> <p>If CR2=0.5 &amp; ROUND4 =1 THEN CR3=0.66</p> <p>If CR2=1 &amp; ROUND4 =0 THEN CR3=0.66</p> <p>If CR2=1 &amp; ROUND4 =1 THEN CR3=1;</p> <p>the value of 999 means missing value.</p> |
| 15 | RPRD | <p><math>RPRD = \frac{(P^* - P)}{P} * 100</math></p> <p>Where P* is the estimated net price and P is the net contract price of the tender and <math>0 \leq RPRD &lt; 100</math></p>  |

## A4. Outputs of the estimations

### SB

```
Treatment-effects estimation      Number of obs      =      122582
Estimator      : propensity-score matching      Matches: requested =      1
Outcome model  : matching                      min =      1
Treatment model: logit                       max =      42
```

|          | sb | Coef.    | AI Robust<br>Std. Err. | z    | P> z  | [95% Conf. Interval] |
|----------|----|----------|------------------------|------|-------|----------------------|
| ATET     |    |          |                        |      |       |                      |
| mgts     |    |          |                        |      |       |                      |
| (1 vs 0) |    | .1900692 | .0299492               | 6.35 | 0.000 | .1313698 .2487687    |

### ICI

```
Treatment-effects estimation      Number of obs      =      85658
Estimator      : propensity-score matching      Matches: requested =      1
Outcome model  : matching                      min =      1
Treatment model: logit                       max =      32
```

|          | ici | Coef.     | AI Robust<br>Std. Err. | z     | P> z  | [95% Conf. Interval] |
|----------|-----|-----------|------------------------|-------|-------|----------------------|
| ATET     |     |           |                        |       |       |                      |
| mgts     |     |           |                        |       |       |                      |
| (1 vs 0) |     | -.0667369 | .0157547               | -4.24 | 0.000 | -.0976155 -.0358583  |

### RPRD

```
Treatment-effects estimation      Number of obs      =      68823
Estimator      : propensity-score matching      Matches: requested =      1
Outcome model  : matching                      min =      1
Treatment model: logit                       max =      26
```

|          | rprd2 | Coef.   | AI Robust<br>Std. Err. | z     | P> z  | [95% Conf. Interval] |
|----------|-------|---------|------------------------|-------|-------|----------------------|
| ATET     |       |         |                        |       |       |                      |
| mgts     |       |         |                        |       |       |                      |
| (1 vs 0) |       | -2.5258 | 1.338116               | -1.89 | 0.059 | -5.148459 .0968589   |

# Figures

Figure 1.: Monthly number of contracts, 2010-2016

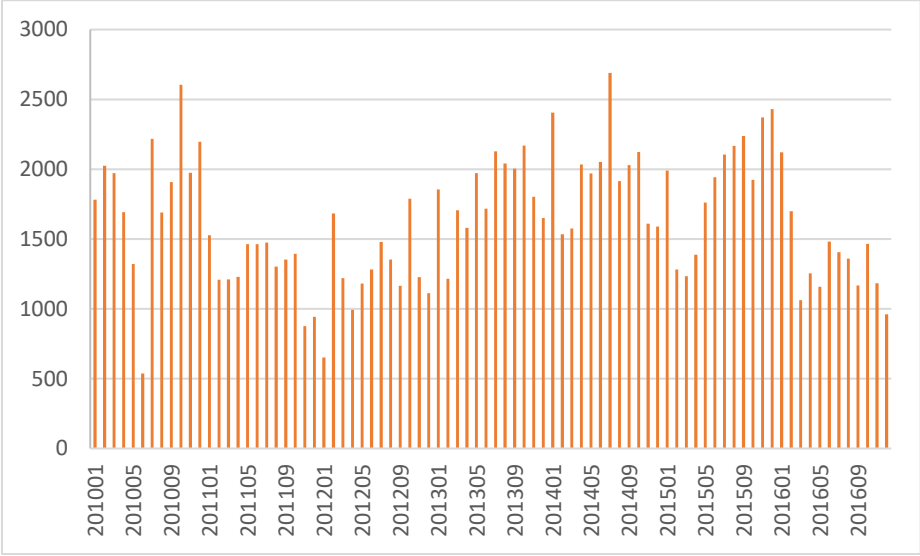


Figure 2.: Aggregated net contract values in the Hungarian public procurement per year, 2010-2016

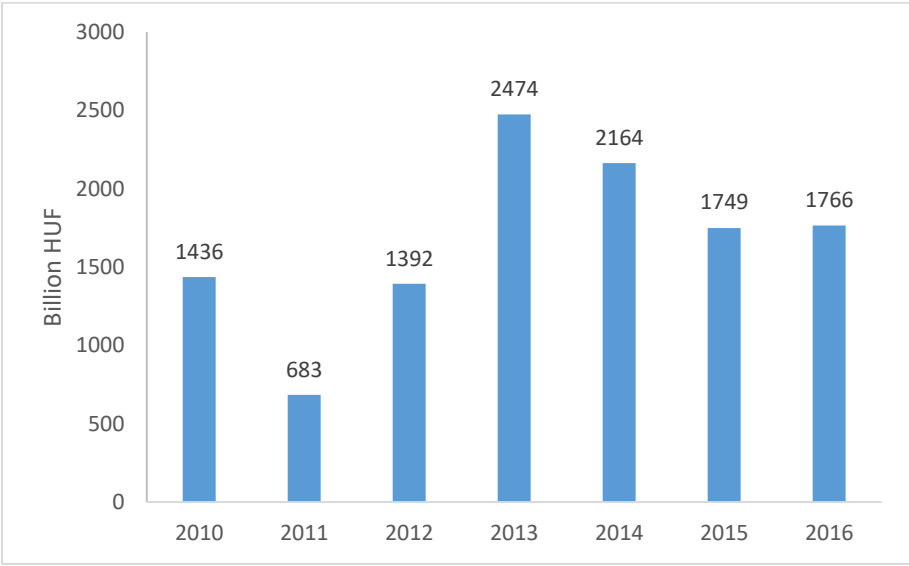


Figure 3: The share of the value of procurement won by MGTS companies of the total value of public procurement, 2010–2016

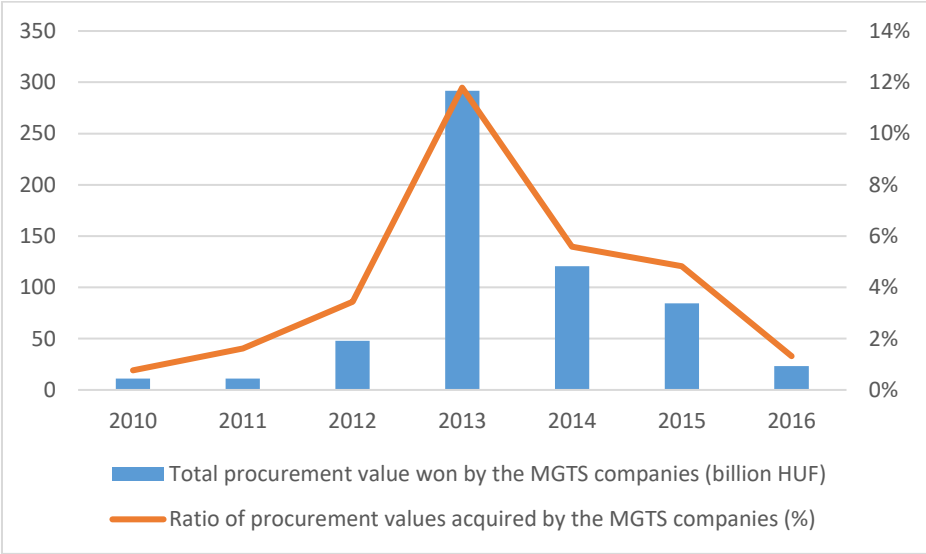


Figure 4: The share of the value of procurement won by MGT and S companies of the total value of public procurement, 2010–2016

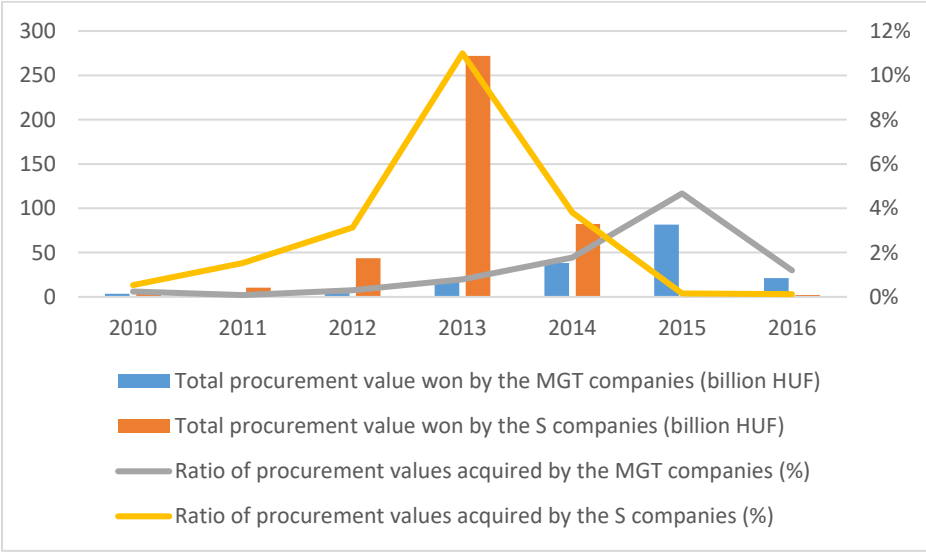


Figure 5: Share of public procurement tenders with single-bidder (SB) within the MGTS group and among other winners, 2010-2016

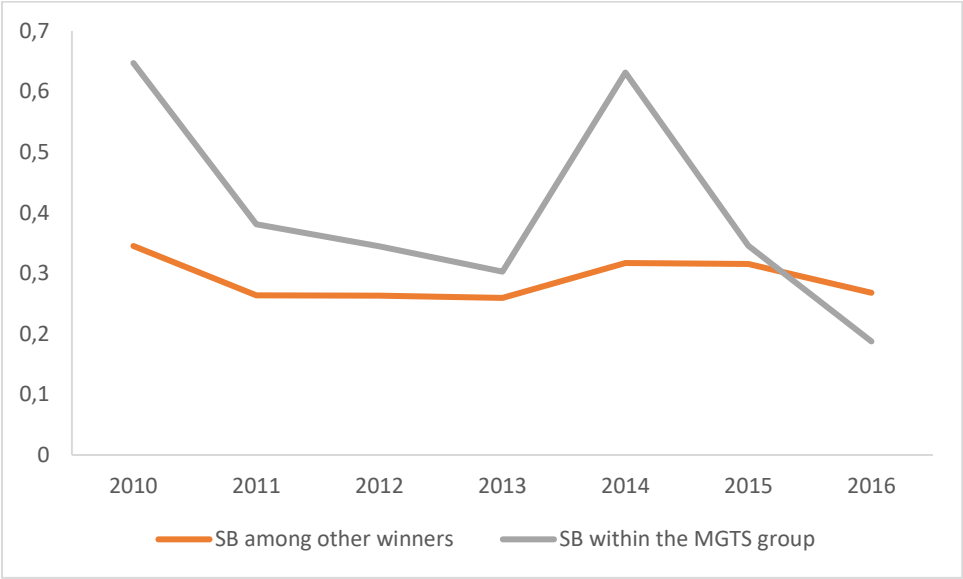


Figure 6: The Index of Competition Intensity in Hungarian public procurement within the MGTS group and among other winners, 2010-2016

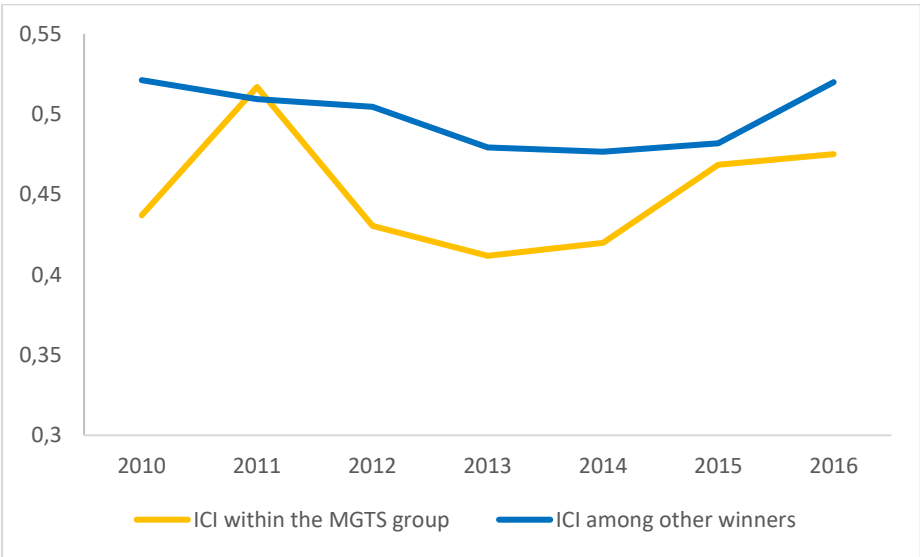


Figure 7: The Index of Competition Intensity in Hungarian public procurement within the MGT and the S group and among other winners, 2010-2016

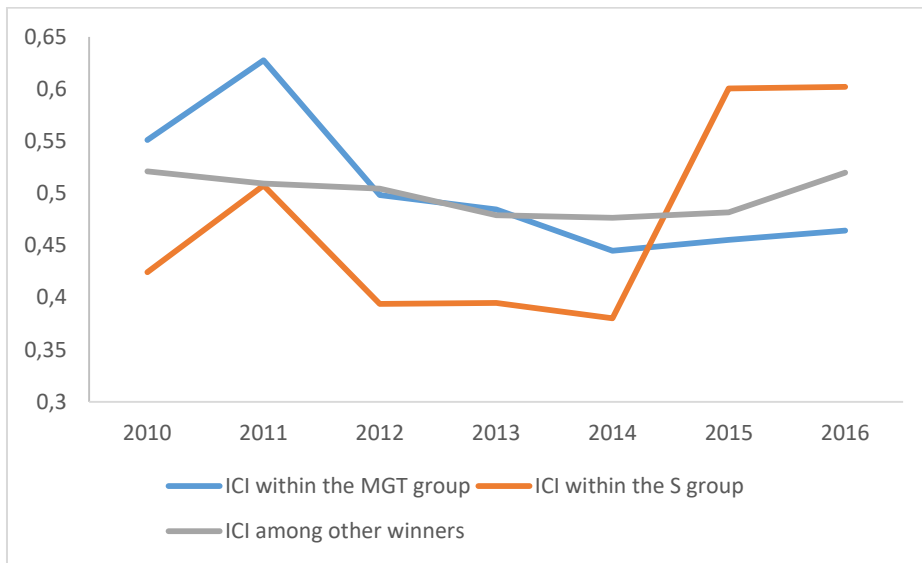
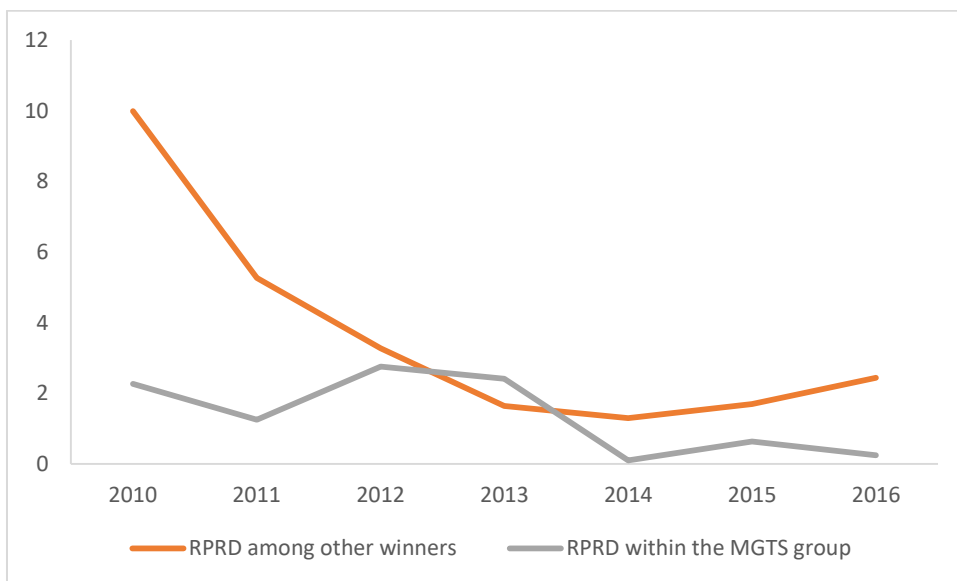
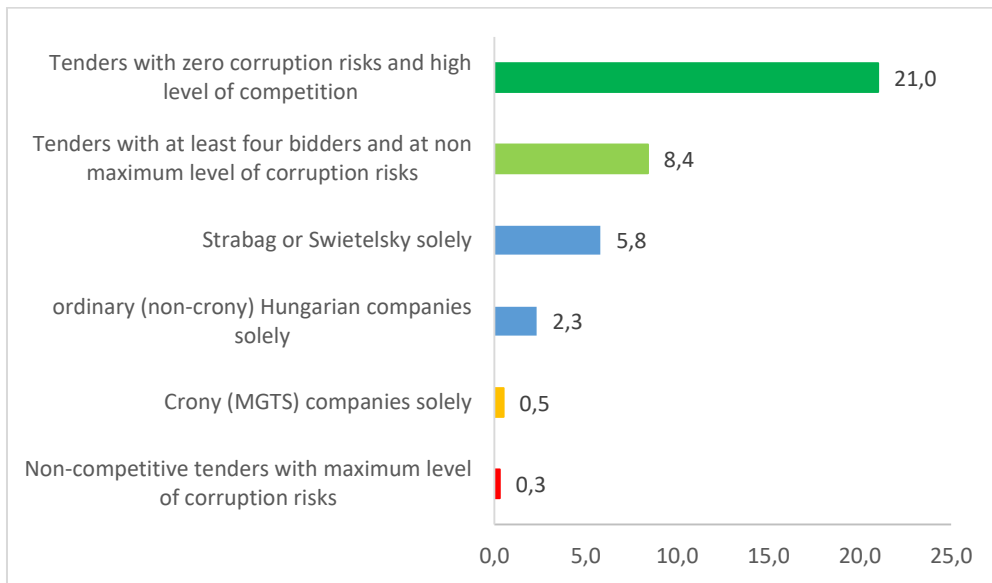


Figure 8: The median of the RPRD indicator in Hungarian public procurement within the MGTS group and among other winners, 2010-2016



Note: only for contracts with  $RPRD \geq 0$

Figure 9: The median value of the relative price drop (RPRD) in tenders won by different groups of winners, construction tenders, 2010–2016, N=20,740



Note: only for contracts with RPRD ≥ 0

Figure 10: The median value of the relative price drop (RPRD) by intensity of competition and in tenders won by companies owned by members of the MGST group, 2010–2016, N=69,010, %

