Behind the Bid Count: Procurement Competition and Politically Connected Suppliers in Hungary

Online Appendix

This appendix documents the institutional setting, data construction, competition estimates and inference checks, closures for want of a second admissible tender, recipient accounting, the buyer-level comparison and the purposive contract follow-up. Numbers prefixed S refer to this appendix; references to the main paper refer to the article. Code, aggregate reference results, curated inputs and source-access metadata are deposited at https://doi.org/10.5281/zenodo.23734725; full raw and record-level panels remain external, and historical re-estimation requires the preserved input snapshots.

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S1 Literature, institutions and alternative explanations

S1.1 Related literature

Contract-level data allow competition to be examined at the point of purchase. Single bidding in procedures open to competition is a widely used indicator of restricted competition and corruption risk (Fazekas et al. 2016; Fazekas and Kocsis 2020), but its interpretation requires a mechanism. In US federal IT and telecommunications procurement, Kang and Miller (2022) show how buyers' search costs and their ability to negotiate can limit the gains from attracting additional suppliers. Low participation alone therefore cannot identify corruption or the failure that oversight should address. Across European regions it is lower where bureaucratic careers are shielded from political connections (Charron et al. 2017), and competition for EU public contracts declined in the decade to 2021 (European Court of Auditors 2023). Its consequences depend on the setting. More discretion below a value threshold raised repeat awards without worsening measured performance in Italy (Coviello et al. 2018), but increased prices and favoured politically connected firms in Hungary (Szucs 2024). Buyers and individual officials account for a large share of price variation (Best et al. 2023), political connections shape who wins contracts (Baltrunaite 2020), and procurement outcomes depend on administrative capacity and on how rules interact with governance (Bosio et al. 2022; Hoekman and Taş 2024). EU-funded procurement has received particular attention. Fazekas and King (2019) find that, in Czechia and Hungary in 2009–2012, EU-funded contracts carried higher corruption risk than comparable domestically funded contracts. More recently, Tóth and Hajdu (2025) report higher single-bid odds for EU-funded awards in a pooled EU-wide model for 2007–2023, but lower odds in their Hungary-specific regression (Table 7). That country result qualifies the aggregate association; neither model identifies the change within buyers or the effect of Hungary's control regime. The Hungarian evidence on politically connected suppliers merits separate consideration because it concerns who obtains public resources as well as how many bids are recorded.

Oversight can change these outcomes through several channels. Much of the procurement literature examines discretion; a related literature examines external control. Monitoring reduced missing expenditure in Indonesian road projects (Olken 2007), and past audits reduced subsequent corruption in Brazilian municipalities (Avis et al. 2018). Public disclosure of Brazilian audit findings also affected electoral accountability (Ferraz and Finan 2008). Oversight can also backfire. Shifting authority from monitors to procurement officers improved purchasing performance in one field experiment (Bandiera et al. 2021). Audits in Chile shifted purchases from auctions to direct contracts (Gerardino et al. 2024), and anti-corruption reforms in aid-funded procurement lowered single bidding where they applied but moved purchases to less competitive procedure types outside their scope (Dávid-Barrett and Fazekas 2020a). Central controls can also delay procedures and interfere with buyers' decisions (Nyikos and Soós 2017). When oversight is judged by an indicator, it can move the indicator more than the behaviour behind it: single bidding among awarded contracts falls if single-bid procedures are cancelled,

or if a second, non-competing tender is added. We examine a large control regime within buyers, test for displacement, cancellation and supporting tenders, and compare the regime with a rule that targeted the indicator directly.

The fiscal interpretation requires a further distinction between procurement performance and programme value. In the Italian purchases studied by Bandiera et al. (2009), most estimated waste was passive: higher costs did not benefit the decision maker. Skills, incentives and administrative capacity can therefore matter alongside integrity controls. Lower award prices are useful evidence, but they do not observe completion, quality or the services obtained over an asset's life. PIMA explicitly distinguishes institutional design from effectiveness in practice and assesses appraisal, maintenance funding, procurement and asset management separately (International Monetary Fund 2022). PEFA likewise separates investment appraisal and costing, procurement, and performance information for service delivery (PEFA Secretariat 2019). These frameworks explain why a procurement indicator alone cannot establish the effectiveness of the whole spending programme.

S1.2 Political favouritism and the interpretation of procurement outcomes

Evidence from the early Orbán governments goes beyond unusually low participation. Using Hungarian non-construction procurement in 2009–2015, Szucs (2024) study a 2011 reform that permitted invitational procedures below HUF 25 million. Buyers sorted contracts below the threshold, so the raw discontinuity does not identify the effect of discretion. A structural model accounting for that sorting estimates that discretion raised relative prices and increased the probability of a winner connected to the governing party by 11 pp. The connection measure combines company representatives and electoral records with manual searches for the largest 500 procurement suppliers. This is evidence of favoured supplier selection under a particular procedural reform, largely below the thresholds studied here; the author explicitly cautions that it is not direct proof of corruption.

The network evidence identifies a broader institutional problem. Fazekas and Tóth (2016) find that high-risk buyer–supplier clusters became relatively more central after the 2010 change of government, using procurement in 2009–2012. Their indicators locate patterns consistent with state capture, although simultaneous changes in the governing elite and public administration prevent a causal separation of those channels. Dávid-Barrett and Fazekas (2020b) compare Hungary with the United Kingdom, where the government also changed in 2010, combining supplier success around the change with procedural risk indicators and interviews. Companies that won or lost unexpectedly after the change did so in higher-risk contracting, and such companies took around 50–60% of Hungarian central-government contracting in 2009–2012, against about 10% in the United Kingdom. These are patterns of access to public resources, rather than observations of bribery, and the findings cover the transition between two partisan networks rather than only firms favoured by the incoming government.

The institutional diagnosis likewise extends beyond bid counts. In the 2022 conditionality

procedure the Commission found, and the Council accepted, systemic irregularities in public procurement, a high rate of single bidding, a rising concentration of awards, weaknesses in the handling of conflicts of interest and limits to investigation and prosecution (European Commission 2022; Council of the European Union 2022). The Commission cited a study it had procured: companies classified as politically connected had been 1.5 to 2.1 times as likely to win public contracts as other companies in 2005–2010, and after 2011 their probability of winning EU-funded contracts was 3.3 to 4.4 times as high (European Commission 2022, explanatory memorandum, para. 25). These findings concern systemic risks to the Union budget, not a measured corruption loss on each contract. More recent descriptive evidence also shows why supplier groups matter: in national-register data for 2025, the CRCB reports single bidding on 71% of contracts awarded to its selected group of politically affiliated suppliers, against 29% for other suppliers (Corruption Research Center Budapest 2026a). This is a comparison of those suppliers' own awards, not their share of all single-bid awards, and neither group is a complete classification of political connections.

For our design, the implication is that procedural competition and impartial allocation are related but distinct outcomes. A favoured supplier can win against several independent bidders if specifications, qualification requirements or evaluation favour it; several bids can also be coordinated. Conversely, an established supplier can repeatedly win fair competitions because it performs well. Changes in bid counts and prices therefore help discriminate among mechanisms, but cannot by themselves determine whether political advantages disappeared. Oversight may constrain one channel of rent extraction while leaving project selection, ownership networks or contract execution outside the outcomes observed here. This possibility is an interpretation to investigate, not a result established by the triple difference.

Procurement performance also leaves the choice of projects unresolved. From 24 interviews involving twelve Hungarian municipalities and other stakeholders, Boros et al. (2026) describe how funding calls and political bargaining shaped projects and how appraisal, utilisation and maintenance could remain weak. These qualitative accounts do not identify prevalence or causal effects, but explain why competitive awards can coexist with poor programme value. They connect the supplier-allocation question to appraisal and service outcomes that procurement indicators do not observe.

S1.3 Institutional setting: the oversight of EU-funded procurement in Hungary

Hungary has long subjected high-value EU-funded procurement to central control; nationally funded procurement was controlled only in part, and only for five years. A central control body checks tender documents before launch and certifies the regularity of each completed procedure. Its records show such certificates in every year from 2012, before the 2014–2020 programming period (Nyikos and Soós 2017). For 2014–2020, Government Decree 272/2014 set out the regime (Government of Hungary 2014, Sections 97 and 101–106). It covered all EU-funded procurements above the EU thresholds for supplies and services and above HUF 300 million for

works, which roughly coincides with the contracts published in TED. It delegated an observer with access to all evaluation meetings and documents. Until 2016 a procedure could not start without a supportive ex-ante certificate. From 2017 procedures could start and contracts could be concluded while controls were under way, but a contract could not enter into force without a supportive closing certificate. From November 2015, Government Decree 320/2015 applied a similar control to the nationally funded procurement of central-government bodies, designated state-owned companies and government foundations: an ex-ante certificate, experts at evaluation meetings and normally a supportive closing certificate before entry into force. Section 13(3) allowed entry into force when the minister missed the decision deadline and no supplementation had been requested. No new controls could be started after October 2020, and the decree was repealed from 2021 (Government of Hungary 2015). Nationally funded local-government procurement remained outside this central-control regime. Nyikos and Soós (2017) know of no other EU country that controls procedures on this scale. The Public Procurement Act of 2015 added a further instrument. A contracting authority may declare a procedure unsuccessful if fewer than two tenders are received, and the minister responsible for public procurement may make this mandatory in procurements subject to control (Hungarian Parliament 2015, Sections 75(2)(e) and 75(6)).

Later changes extended pressure to nationally funded procurement. From February 2021, the procedure without a published contract notice that Hungarian law allows for works below HUF 300 million, in which the buyer invites at least five firms directly, could no longer be used in EU-funded procurement; these contracts are largely below the EU thresholds (Hungarian Parliament 2015, Section 115; Integrity Authority 2025b). In the 2022 rule-of-law conditionality procedure, the Commission and Hungary disagreed about what the lower single-bid rate of EU-funded procurement showed. Hungary argued that the lower rate demonstrated effective controls against limited competition. The Commission disputed that inference (European Commission 2022). Hungary undertook to reduce single bidding below 15% in EU-funded procedures in 2022 and, in three steps, in nationally funded procedures by the end of 2024 (Council of the European Union 2022; European Commission 2022). Government Decree 63/2022, in force from 15 March 2022, extended the two-tender rule beyond controlled procurement. In its original version, above-EU-threshold open and restricted procedures required prior market consultation unless the notice invoked the fewer-than-two-tenders failure ground, when the relevant CPV group's prior single-bid rate exceeded 30% and its share of successful procurements exceeded 2%. An additional rule covered government-supervised bodies and wholly state-owned companies whose own prior rate exceeded 20% and which had conducted at least ten above-threshold procurements (Government of Hungary 2022, Sections 1–3). From 15 March 2024, Decree 53/2024 broadened the consultation-or-two-tenders requirement to open, restricted and negotiated procedures, competitive dialogue and procedures under Section 117 of the Act, retaining exceptions for frameworks, dynamic purchasing systems and other stated channels (Government of Hungary 2024, Sections 6–10). Buyers whose prior above-threshold

single-bid ratio exceeded 20% had to publish an action plan, except those with fewer than five such procurements (Government of Hungary 2022, Section 5). The 2022 national comparison therefore captures a commitment period with selective legal exposure; it does not identify a uniform nationwide rule. The official ratio, like our award-based measure, excludes unsuccessful procedures. The national targets of 24% for 2023 and 15% for 2024 were missed: Hungary notified 28.95% in 2023, 22.3% in 2024 and 22% in 2025, and the Commission found the remedial measure not entirely fulfilled (European Commission 2026d, paras. 130–132). The Integrity Authority reports 5.5% for EU-funded procurement in 2023, down from 13.3% in 2022 (Integrity Authority 2024), and the Commission reports that the EU-funded share rose from 4.2% in 2024 to 9.5% in 2025 (European Commission 2026b, p. 17, fn. 124). Headline figures differ across sources and vintages. The Single Market Scoreboard, which calculates its indicator from eligible TED records under its own coverage rules, including exclusions for frameworks, reports 34% single bidding for Hungary in 2024 (European Commission 2025). The Integrity Authority, created in 2022, continues to identify supporting tenders as a risk behind recorded competition (Integrity Authority 2026). Finally, expenditure under the 2014–2020 programmes ceased to be eligible at the end of 2023 (European Parliament and Council of the European Union 2013, Art. 65(2)), so EU-funded procedures from 2024 relate mainly to the 2021–2027 programmes. Much of that funding was blocked. From December 2022, 55% of the budgetary commitments of three cohesion programmes were suspended under the conditionality procedure (Council of the European Union 2022), and a year later the Commission still counted around EUR 21 billion of funding for Hungary as locked, including the payments of its recovery plan (European Commission 2023). EU-funded procurement after 2023 is therefore a smaller and more selected set. On 23 September 2026, after our data end, the Commission proposed that the Council lift the 2022 measures following its assessment of the reform package, despite incomplete fulfilment of the national single-bid commitment (European Commission 2026d). The Council adopted the lifting decision on 13 October 2026 (Council of the European Union 2026); neither act tests or validates our historical estimates. Our data end with the Fidesz-led governments: Parliament elected Péter Magyar prime minister on 9 May 2026 (Government of Hungary 2026), and notices published from that day on are excluded. Annual post-2023 estimates therefore describe a changing funding setting and cannot isolate the effects of the earlier rules from subsequent changes.

S1.4 Predictions and alternative explanations

The setting yields five predictions. First, if the 2014–2020 regime constrained discretion, single bidding should fall in EU-funded relative to nationally funded contracts from the time its procedures became common, within the same buyers and markets, and by more than in the other CEE countries. Ex-ante controls already operated from 2012; if they were enough by themselves, the change should begin then rather than with the 2014–2020 procedures. Second, if discretion was displaced rather than removed, single bidding in nationally funded contracts

should rise relative to the region over the same period. Third, if the 2022 commitments and the extension of the two-tender rule had force, single bidding in nationally funded contracts should fall relative to the region from 2022; if the rule worked mainly through the indicator, the fall should go to exactly two bids and to procedures that end without an award. Fourth, if lower single bidding reflects more competition, the prices of EU-funded contracts should fall relative to the buyers' own estimates. Fifth, if control of the procedure is enough by itself, single bidding in the nationally funded procurement of central-government bodies should have fallen while it was controlled, relative to that of local governments.

Four alternative explanations could produce a lower single-bid rate among awarded EU-funded contracts without more competition. Procedures expected to attract a single bid could be moved to national funding (*relabelling*), as in the displacement documented by Dávid-Barrett and Fazekas (2020a). Single-bid procedures could be declared unsuccessful, which the two-tender rule makes mechanical, and never produce an award (*cancellation*). A second, non-competing tender could be added to avoid a single bid (*supporting tenders*), which would shift mass from one bid to exactly two without adding independent competitors. Or the projects financed from EU funds could change (*composition*). Sections 5.1 and 5.2 of the main paper examine the observable implications of each. These tests concern how single bidding fell. Even a fall accompanied by additional independent bids would not establish that politically connected suppliers lost their advantages; that requires a separate test of supplier selection.

S2 Procurement data, methods and supporting results

This section retains the data definitions, diagnostic comparisons and alternative specifications supporting the procurement results in the main text.

S2.1 Extended data description

S2.1.1 Procurement contracts

Contract data come from Tenders Electronic Daily (TED), the EU's publication platform for procurement above the EU thresholds. For 2010–2023 we use the TED CSV dataset (European Commission, DG GROW 2024), which reports the standard forms in flat files. Following its codebook, we keep one observation per contract award, drop cancelled notices and procedures that ended without an award, and exclude EU institutions. From October 2023, notices are published in the new eForms standard, which the CSV dataset does not cover. We therefore downloaded all eForms contract award notices of the eleven CEE member states published from October 2023 to 8 May 2026, the last day of the Fidesz-led governments in Hungary, through the TED Search API (Publications Office of the European Union 2026b), and mapped them onto the same schema: one observation per lot result with a selected winner; procedure types, buyer legal types and buyer main activities recoded to the earlier categories; and the EU-funding indicator taken at lot level. Bid counts are the number of tenders received for each lot; where buyers report only the number of electronically submitted tenders, as many Polish buyers do,

we use that figure, since electronic submission is mandatory. The stacked CEE panel contains 5,301,455 awards, of which 1,507,705 come from eForms.

Our main outcome is *single bidding*: an indicator equal to one when only one tender was received. Following the Single Market Scoreboard and Fazekas and Kocsis (2020), we restrict the sample to procedures with a call for competition (open, restricted, competitive negotiated, competitive dialogue and innovation partnership) and exclude framework agreements and dynamic purchasing systems. In eForms, Hungarian two-stage national procedures, which the old forms recorded as restricted, are coded as "other multiple-stage" procedures; we include them and show that excluding them does not change the results. Estimation additionally drops singleton fixed-effect observations, so the fitted count is smaller than the design sample. The resulting sample contains 3,256,573 awards from 791,349 notices and 42,237 buyers with an observed bid count and EU-funding indicator. Country-years are excluded from the contract-level designs when fewer than 70% of competitive awards report a bid count (Supplementary Section S7). Because some tenders are split into hundreds of lots, each award is weighted by the inverse of the number of awards in its notice, so that each notice contributes at most one unit after analytical exclusions; unweighted estimates are reported as a robustness check.

The second outcome is the *relative price*: the value of the contract at award divided by the value estimated by the buyer before the procedure, which is one minus the winning rebate used by Coviello et al. (2018). The CSV award field may contain a lowest-bid fallback rather than a verified final winning value; it does not measure costs after execution. We use it when both values are available and the ratio lies between 0.2 and 2, which removes obvious unit errors; in eForms we compute it only for single-lot notices, because lot-level values cannot always be matched to results. Relative prices are available for 58% of awards before 2024 and for few eForms awards, so the price analyses focus on 2010–2023.

For the mechanism tests we also use the number of bids and the award criterion of each award. To measure procedures that ended without an award, we link calls for competition to the award notices that followed them. The TED CSV files of calls record, for each call, the identifiers of the later award notices (European Commission, DG GROW 2024). For the 536,506 competitive calls of 2010–2022 with an EU-funding indicator, we record whether any linked award notice reports an award and the number of days from the dispatch of the call to the award. Unlike the non-award field of award notices, this includes calls with no linked notice reporting an award. It measures the absence of a reported award, which can reflect an unsuccessful or abandoned procedure, delayed publication or a missing link; it is not a direct register of cancellations. Calls published from 2023 cannot be linked, because many of their awards appear only in eForms.

Buyers are identified by their normalised name within a country. National identifiers are not usable over time: in Hungary, for example, they change from Public Procurement Authority codes to e-procurement system codes and finally to tax numbers. Of the awards published in eForms from 2024, 83% come from buyers already observed in 2021–2023 under the same normalised name. This is a name-match rate, not a validated rate of historical buyer continuity.

Supplier identities require a separate crosswalk. In Hungary the winner identifier field was absent through 2015 but widely populated by 2019, often with e-procurement platform codes. Combining identifiers where available with names otherwise splits the same supplier into different keys across this transition. Raw notices confirm cases in which an identical supplier name won from the same buyer in 2018 and 2019 but appeared new under that rule. We therefore exclude this winner-entry measure. A validated historical crosswalk, including all consortium members, is necessary before changes in winning relationships can be interpreted in TED. For recipients, Section 5.3 of the main paper therefore uses a different source, the national e-procurement contract registry, which identifies all contracting parties by tax number from 2018.

Framework agreements are also outside the main sample. This matters substantively: the Commission's 2026 country chapter identifies frameworks and purchases without reopened competition as continuing procurement concerns (European Commission 2026b, pp. 17–18). Our results consequently describe competitive procedures outside frameworks and cannot establish improvement across the whole procurement market.

S2.1.2 Validation and data quality

We compare the TED measures with published official statistics (Supplementary Table S12). Hungary's single-bid share in 2021 is 41% in our data and 40% in the Commission's figure (European Commission 2026a); the EU-wide rise in single bidding over 2010–2021 matches the finding of the European Court of Auditors (European Court of Auditors 2023). For Hungary after 2022, our nationally funded shares are higher than the published commitment figures. According to the Hungarian government, as reported by the Commission, that series covers procedures under EU rules, which TED also covers, and the share is below 20% when procedures under national rules are included (European Commission 2026b, p. 17, fn. 124). Differences in sample selection, indicator definitions, weighting and data vintage have not been fully reconciled. The EU–national gap has the same sign in the reported comparisons, but numerical agreement should not be assumed. We also identified reporting breaks that would distort naive comparisons: Slovenian award counts rise fivefold in 2017–2021 because many small lots are reported separately, and Czech single-bid shares are implausibly low in 2013–2014. Notice weighting and fixed effects for buyers and country-years address these breaks; the Hungarian results do not depend on Czech or Slovenian data (Section 5.5 of the main paper).

S2.2 Extended empirical strategy

We compare the difference between EU-funded and nationally funded contracts in Hungary with the same difference in the other ten CEE countries, within buyers and markets, year by year.

S2.2.1 Exposure

EU-funded procurement in the scope studied here was already subject to central control before the 2014–2020 programmes; nationally funded procurement was controlled only in part and only in 2015–2020 (Section 3 of the main paper). Ex-ante controls already operated from 2012. The regime of the 2014–2020 programmes added an observer to each procedure, a closing certificate on which the contract's entry into force depended, and the power to require that procedures with fewer than two tenders be declared unsuccessful. We therefore treat that regime as a bundle and date exposure to it by when the 2014–2020 programmes financed EU-funded spending, which does not depend on procurement outcomes. Expenditure under the 2007–2013 programmes was eligible until the end of 2015 (Council of the European Union 2006, Art. 56). In the Commission's modelled expenditure, the 2014–2020 programmes accounted for 6% of Hungary's EU-financed spending in 2015 and for all of it from 2016, and their spending rose from 1.0% of GDP in 2016 to 3.0% in 2020. The switch took place in the same years in all eleven CEE countries, so its common effects are absorbed by the EU-funding × year effects below. The year 2015 is a transition year: the last in which 2007–2013 funds could be spent, when buyers may have rushed to commit expiring funds. We keep 2014 as the reference year, leave 2015 out of both the pre-period and the post-period averages, and report the pre-trend diagnostics with 2015 counted as a pre-period year as well.

S2.2.2 Estimating equation

The estimating equation is equation (1) in the main text, where SB is the single-bid indicator (in pp) for award i of buyer b in market j, country c and year t; EU_i indicates EU funding; μ_b are buyer fixed effects; λ_{ct} are country-year effects that absorb national changes affecting all procurement, such as the 2015 Public Procurement Act; $\kappa_{c,EU}$ allow a permanent EU–national difference in each country; $\theta_{t,EU}$ allow the EU–national difference to change over time in the same way across CEE, for example through EU-wide audit rules, financial corrections or the switch between programming periods; and $\mathbf{z}_{it}$ contains fixed effects for CPV division × year, value decile × year, procedure, contract type and buyer type. Awards are weighted by the inverse of the number of awards in their notice, and standard errors are clustered by buyer. The reference year is 2014, the last year before the 2014–2020 programmes financed any spending; we also report estimates relative to 2010–2013 pooled. To see which side of the gap moved, we estimate separate event studies for EU-funded and for nationally funded contracts, comparing Hungary with the other CEE countries within each funding type; for nationally funded contracts the reference year is 2021, providing a descriptive comparison around the 2022 commitments.

S2.2.3 Identification

The identifying assumption is that, absent Hungary's regime, its EU–national gap would have evolved like the gap in the other CEE countries, within buyers and markets. Because $\theta_{t,EU}$

removes whatever EU funding brings everywhere, including the Commission's audits and financial corrections, the estimates measure what was specific to Hungary's treatment of EU-funded procurement. They measure a regime as a whole and cannot separate its components, or the regime from scrutiny by the Commission directed at Hungary. Because the nationally funded procurement of central-government bodies was also controlled in 2016–2020, the comparison within Hungary is between full and partial control; if control as such lowered single bidding, the estimates understate its effect. The pooled comparison weights the other countries by their number of tenders: Poland accounts for 44% of the comparison notices. We therefore also compare Hungary with country-level estimators that weight the other countries equally or by their fit to Hungary's pre-period. We test pre-period coefficients jointly and assess how far the conclusions survive violations of parallel trends. We report estimates with a linear pre-trend removed and an illustrative sensitivity calculation inspired by Rambachan and Roth (2023): the largest post-period change in the differential trend, relative to the largest estimated change between consecutive pre-period coefficients, at which an approximate 95% interval excludes zero. The calculation treats the estimated pre-period change as known and ignores its sampling uncertainty; it does not implement the authors' conditional confidence sets (on the limits of pre-tests, see also Roth 2022).

S2.2.4 Inference with one treated country

Buyer-clustered standard errors can overstate precision when treatment changes at country level and only one country is treated (Conley and Taber 2011; Ferman and Pinto 2019). We use three complementary approaches. First, we re-estimate equation (1) treating each of the other CEE countries in turn as if it were Hungary, on samples that exclude Hungary, and compare Hungary's estimate and path with this placebo distribution. We report Hungary's rank divided by eleven and a placebo-error range formed by subtracting the largest and smallest placebo estimates from its estimate. These are descriptive diagnostics inspired by Conley and Taber (2011), not calibrated randomisation probabilities or confidence sets: exposure was not randomly assigned, the treated and placebo fits use different samples, and exchangeability of their errors is not established. Second, we aggregate the data to country-year gaps: for each country, the within-buyer EU–national difference in single bidding in each year, estimated with the fixed effects of equation (1) that do not involve other countries. On the balanced panel of nine countries (excluding Croatia, whose data start at accession, and Estonia, whose 2013 gap is unobserved after the reporting filter) we estimate synthetic difference-in-differences (Arkhangelsky et al. 2021) and synthetic control (Abadie et al. 2010), with 2010–2015 and, without the transition year, 2010–2014 as pre-periods and placebo standard errors; we also remove from each country's difference to the others a linear trend fitted over 2010–2014. These estimators show which comparison countries and which pre-period years carry the weight. Third, we report the robustness of the estimates to weights, samples, fixed effects and the reference period.

S2.2.5 Alternative explanations

Four tests address the alternatives of Section 2.2 of the main paper. Cancellation would raise the share of calls that end without an award. Relabelling would raise single bidding in nationally funded contracts. Removing single-bid awards in either way would spread the fall in single bidding over the other awards in proportion to their shares, so that the share of awards with exactly two bids would rise along with that of three or more; supporting tenders would raise the share with exactly two bids without adding independent competitors. Changes in the probability that a buyer's contract is EU-funded reveal shifts in the funding mix, but cannot rule out changes in project characteristics within that mix. We therefore estimate equation (1) for the log number of bids among contracts with at least two bids, the number of bids, the probabilities of exactly two, three or more, and four or more bids, the probability of a price-only award criterion; and, at the level of calls, for the probability that a call ends without a reported award and for the log number of days from call to award, which also measures a cost of oversight. We estimate the bid-count outcomes and the probability that a call ends without an award for nationally funded contracts as well, because the commitments and selectively covered two-tender rule began in 2022. We estimate the single-bid price premium by regressing the relative price on the single-bid indicator with buyer, country-year and the market fixed effects of equation (1), and equation (1) for relative prices, among all awards and separately among single-bid awards, where more competition cannot explain a fall, and among awards with several bids.

S2.2.6 Control of the procedure

Decree 320/2015 allows a test of whether central control of the procedure is enough by itself. Within Hungary, we compare the nationally funded procurement of central-government bodies, controlled in 2016–2020, with that of local governments, which remained outside that regime, and estimate how each group's EU–national gap changed, with buyer and market fixed effects. Because the 2012–2013 transfer of schools and hospitals from local governments to central maintainers changed some buyers' type within the base period, we repeat the comparison for buyers whose type never changes.

S2.3 Detailed results and diagnostics

S2.3.1 The divergence and its timing

Figure S1 shows the raw pattern. Until 2014, single bidding in Hungary was similar in EU-funded and nationally funded contracts, between 28% and 36%. In 2015, the last year in which 2007–2013 funds could be spent, single bidding in EU-funded contracts jumped to 43%, from 32% in 2014. From 2016 the two series diverge. Single bidding in EU-funded contracts falls from 27% in 2016 to 10% in 2023, while in nationally funded contracts it rises to 44% in 2021 before falling to 24% by 2025. In the other CEE countries both series move together, with EU-funded contracts slightly less often single-bid. Table S1 shows that the Hungarian

Table S1: EU-funded minus nationally funded single-bid probability within buyers (pp)

	2010–14	2015–19	2020–23	2024–26
Bulgaria	−10.0 (2.3)	−8.3 (2.1)	−9.3 (1.8)	−9.5 (1.6)
Czechia	+4.5 (1.1)	−0.9 (1.4)	−0.9 (1.6)	+2.3 (1.2)
Estonia	+0.1 (3.4)	−0.5 (3.9)	+1.2 (2.9)	−1.9 (2.8)
Croatia	+1.1 (13.2)	−2.0 (2.8)	−5.1 (2.5)	−3.7 (3.5)
Hungary	+1.3 (1.8)	−8.6 (1.8)	−15.3 (2.6)	+0.4 (3.2)
Lithuania	−2.3 (2.5)	−4.0 (2.1)	−2.6 (1.8)	−7.1 (2.5)
Latvia	−1.0 (2.9)	−0.3 (2.4)	−3.4 (2.5)	+0.8 (1.6)
Poland	−0.2 (0.8)	−1.3 (0.8)	−3.4 (0.7)	+2.8 (0.9)
Romania	−8.4 (1.9)	−0.8 (1.8)	+6.2 (1.4)	−2.1 (3.4)
Slovenia	+0.3 (2.5)	+3.8 (2.8)	+10.4 (2.7)	+0.3 (3.8)
Slovakia	+3.0 (2.8)	−9.8 (3.0)	−11.1 (2.1)	−7.3 (1.9)

Notes: Coefficients on EU funding interacted with period, from notice-weighted linear probability models estimated separately for each country with fixed effects for buyer, CPV division × year, value decile × year, procedure, contract type and buyer type. Standard errors clustered by buyer in parentheses. Competitive procedures without framework agreements or dynamic purchasing systems. Country-years with bid counts for less than 70% of awards are excluded (see Supplementary Section S7 for the full list).

divergence holds within buyers. In each country, it reports the difference between EU-funded and nationally funded contracts of the same buyer. In most countries this difference is small and stable; Bulgaria's is negative (8–10 pp) in every period. Hungary's gap is close to zero in 2010–2014 (+1.3 pp), opens to −8.6 pp in 2015–2019 and −15.3 pp in 2020–2023, and closes in 2024–2026. Measured from 2010–2014 to 2020–2023, this change of −16.6 pp is the largest of the eleven countries. Slovakia comes second with −14.1 pp, and in 2015–2019 its shift is larger than Hungary's. Slovakia also subjected procurement in EU-funded projects to controls by managing authorities and the public procurement office in the 2014–2020 period, although ex-ante control by the managing authority was voluntary there (Centrálny koordinačný orgán 2022). We therefore treat Slovakia as a partly treated comparison country; Section 5.5 of the main paper shows that excluding it changes little. The within-buyer ranking uses the same data as the triple difference below and is not independent evidence.

The triple-difference estimates in Figure 1 of the main paper show that the divergence is not shared by the region and that it begins with the 2014–2020 programmes. The coefficients for 2010–2013 average −0.2 pp and are jointly indistinguishable from zero ($p = 0.93$). The 2015 coefficient is +4.0 pp (standard error 3.7). In that year Hungarian EU-funded procedures were also completed much faster than usual (−54.0 log points from call to award, relative to national calls and the region), and the share of contracts financed from EU funds peaked, consistent with a rush to commit expiring funds (compare Liebman and Mahoney 2017). From 2016, when the 2014–2020 programmes came to finance all EU-funded spending, Hungary's

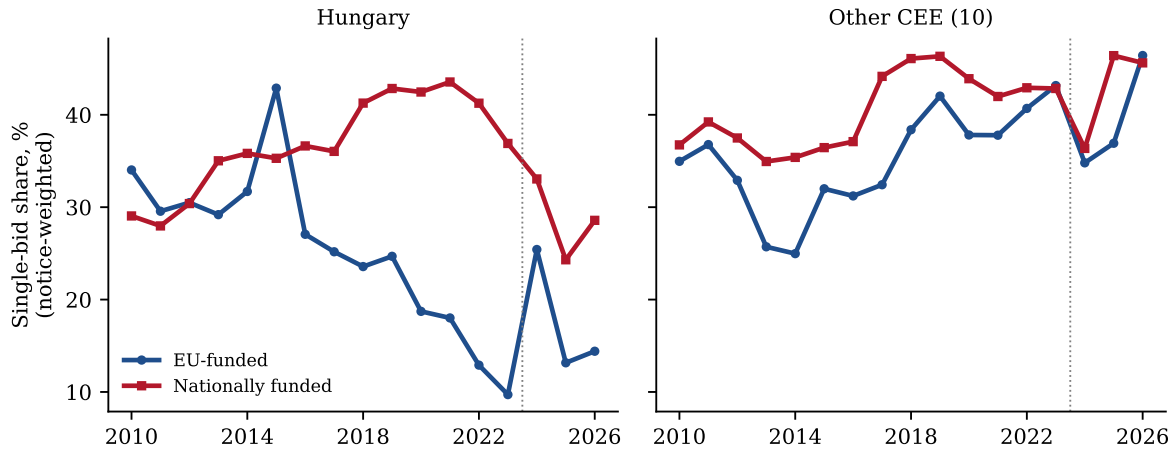


Figure S1: Single-bid share in competitive procedures by funding source, 2010–2026 (notice-weighted). Source: TED CSV (2010–2023) and eForms award notices (October 2023 – 8 May 2026); author's calculations. Country-years with inadequate bid-count reporting are excluded. The dotted line marks the change to eForms data.

EU–national gap widens. The coefficients average −12.7 pp in 2016–2020 and −21.0 pp in 2021–2023, reaching −23.6 pp (standard error 4.8) in 2023; relative to 2010–2013 pooled, they average −12.4 and −20.8 pp. The effect grows steadily rather than moving with the programmes' spending, which peaked in 2020 (the bars in Figure 1 of the main paper): within 2016–2022, the yearly coefficients and this spending are correlated at only −0.33. The timing therefore dates the change to the 2014–2020 regime but does not show a dose–response. The largest coefficients, in 2022–2023, also coincide with Hungary's commitment to keep single bidding in EU-funded procedures below 15%. After 2023, when the 2014–2020 programmes ended and the national rules tightened, the coefficients shrink to −7.3 pp on average and become imprecise; of the three, only the coefficient for 2026, which covers January to 8 May, has a 95% interval that excludes zero.

Figure S2 shows which side of the gap moved. Relative to EU-funded contracts in the other CEE countries, single bidding in Hungarian EU-funded contracts fell: the coefficients average −22.8 pp in 2016–2020, −35.6 pp in 2021–2023 and −32.0 pp in 2024–2026, against −4.5 pp in 2010–2013; the 2011 coefficient is negative and significant, so this pre-period is less flat than that of the triple difference. Nationally funded Hungarian contracts, by contrast, tracked the region until 2021: their coefficients average −1.5 pp in 2016–2020 relative to 2021, and none is significantly different from zero. The rise in Hungarian national single bidding visible in Figure S1 was consistent with a region-wide increase and provides no clear evidence of displacement from EU-funded to national procedures. Together the two comparisons imply a larger effect than the triple difference: on a common 2014 reference, the EU-funded comparison minus the national one gives −19.2 pp in 2016–2020 and −28.3 pp in 2021–2023, against −12.7 and −21.0 pp. The separate comparisons estimate buyer and market effects separately for each funding source, so each buyer has its own EU–national difference. With buyer × EU-funding

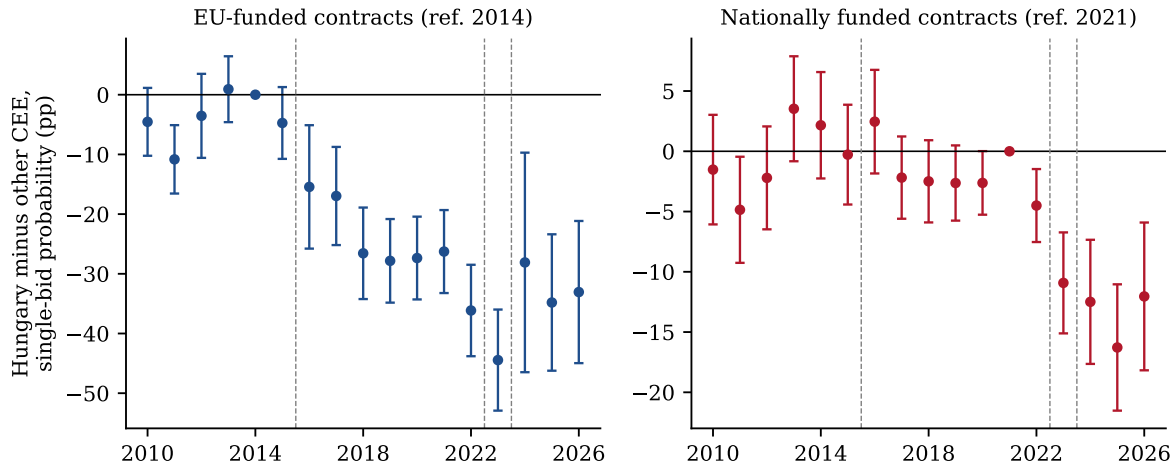


Figure S2: Hungary relative to the other CEE countries, separately for EU-funded and nationally funded contracts (pp). Difference-in-differences event studies with buyer, CPV division × year, value decile × year, procedure, contract type and buyer-type fixed effects; 95% confidence intervals clustered by buyer. Vertical lines as in Figure 1 of the main paper.

fixed effects, the triple difference is −17.2 pp in 2016–2020 and −24.0 pp in 2021–2023, most of the way to the separate comparisons, with an equally flat pre-period (−0.1 pp) and a 2015 coefficient of −1.2 pp (Table S5). The 2015 spike thus reflects which buyers carried EU-funded contracts that year. We take the baseline triple difference, which lets the EU–national difference vary by country but not by buyer, as the main and more conservative estimate.

S2.3.2 More competition or fewer single-bid awards?

A lower single-bid rate among awarded contracts could arise without more competition. Table S2 tests the four alternatives of Section 2.2 of the main paper; Supplementary Figure S10 shows the yearly estimates.

We first examine whether fewer procedures reached a reported award. Linking calls for competition to their award notices, Hungarian EU-funded calls showed little differential increase in the absence of a reported award compared with national calls and the region: the coefficients average −0.2 pp in 2016–2020 and −0.9 pp in 2021–2022, against −4.1 in 2010–2013 and a fall in single bidding of 13–21 pp. In 2022 calls ended more often without an award in Hungary under both funding sources (Section 5.2 of the main paper); the triple difference nets out the common rise. The linked-call measure provides no evidence of a large differential increase, but missing or delayed award reports prevent a definitive exclusion of cancellation.

A shift in funding labels would leave a different trace. If buyers had moved procedures likely to attract a single bid to national funding, the nationally funded pool would have absorbed them. With nationally funded awards 3–15 times as numerous as EU-funded ones in Hungary in 2016–2023, a 20 pp fall in EU-funded single bidding produced this way would have raised national single bidding by about 1–4 pp. Hungarian national contracts tracked the region until

2021, which weighs against a large shift to national funding. Because the predicted national change is small, however, this comparison cannot exclude relabelling as a partial explanation.

The distribution of bids offers a further way to distinguish these explanations. If removal left the composition of multi-bid awards unchanged, removing single-bid awards by relabelling or cancellation would spread the fall in single bidding over the remaining awards in proportion to their shares; in 2010–2013, 32% of Hungarian EU-funded awards with several bids had exactly two. Measured against 2010–2013, single bidding changed by −12.4 pp in 2016–2020. Removal alone would then have raised the share of awards with exactly two bids by 4.0 pp and that with three or more by 8.4 pp; the observed changes are +1.7 and +10.7 pp, and among contracts with at least two bids the number of bids did not change (+3.6 log points). Until 2020, then, the bid distribution cannot distinguish more competition from fewer single-bid awards. In 2021–2023 it departs more clearly from that mechanical benchmark. Removal would have raised the two-bid share by 6.7 pp; it changed by +1.0 pp, while the share of three or more bids rose by +19.7 pp against 14.1, and the number of bids among contracts with several bids rose by +14.4 log points. A single supporting tender would add mass at exactly two bids; the observed shift towards larger bid counts is more consistent with wider participation, although it does not establish that every bid competed independently. Measured against 2014, as in Table S2, the shift to three or more bids looks larger already in 2016–2020, because two-bid awards were unusually common in 2013–2014.

The shift also extends beyond three bids. In an additional diagnostic using the same sample and specification, the share of awards with four or more reported bids rises by +3.9 pp in 2016–2020 and +14.2 pp in 2021–2023 relative to 2010–2013. Relative to 2014, the corresponding averages are +15.7 and +26.0 pp (Table S2); large early pre-period coefficients make the choice of reference consequential. The later increase is harder to explain by adding only one supporting bid, but four reported bids do not establish independent competition or rule out coordinated bidding.

More bids do not by themselves establish impartial supplier selection. The Integrity Authority's latest inspection-based report identifies supporting bids, especially in procedures subject to a two-bid requirement, as a continuing concern (Integrity Authority 2026, pp. 76–77). It does not estimate their prevalence in our sample. Submitted offers also need not be admissible offers: in a later Kecskemét framework call-off, the original evaluation lists four bidders but rejects two, leaving Colas and Duna Aszfalt as the two valid bidders (Kecskemét Megyei Jogú Város Önkormányzata 2025, pp. 3–6). The corresponding TED notice reports zero inadmissible tenders (Kecskemét Megyei Jogú Város Önkormányzata 2026), illustrating why notice-level counts require validation against evaluation files. This selected case lies outside our open-procedure estimation sample and establishes neither the prevalence of invalid bids nor coordination between bidders. Our TED panel lacks a comprehensive dated crosswalk of supplier identities, ownership and political connections. An exploratory comparison using a separate national-register release shows how strongly supplier-group differences depend on

buyer composition (Supplementary Section S9), and Section 5.3 of the main paper uses the national contract registry, which identifies every contracting party by tax number, to examine who received the contracts. The price evidence below helps assess whether wider participation was economically meaningful.

Changes in the projects financed remain another possibility. Buyer fixed effects remove differences between buyers, but not changes in what each buyer finances from EU funds. Within buyers, the probability that a Hungarian contract was EU-funded, relative to the region, followed the programme cycle. It rose towards the end of the 2007–2013 programmes, peaking in 2015, returned by 2018–2021 to its 2010–2011 level and fell further in 2024–2026. This movement does not track the single-bid divergence: with the EU-funded share at the same level, the triple-difference coefficients were close to zero in 2010–2011 and between −15 and −19 pp in 2018–2021. This weakens a simple explanation based on the funding share, but similar shares can finance different projects and the available controls do not observe all changes in project complexity or supplier markets.

S2.3.3 Prices

Single bidding matters for public finances because it goes with higher prices. Within the same buyer, market and year, contracts that received a single bid were awarded at prices 14.1% higher relative to the buyer's own pre-tender estimate than contracts with several bids across CEE (13.2 log points), and 9.2% higher in Hungary (Table S3). Applied to relative prices, the triple difference shows that Hungarian EU-funded contracts had lower award-to-estimate ratios over the period in which participation widened. The coefficients average −5.3 log points in 2016–2020 and −11.1 in 2021–2023, reaching −13.3 in 2023, with no individually resolved pre-period coefficients. If the fall in single bidding had come only from removing single-bid awards from the EU-funded pool, under a constant conditional premium, the pool's average log relative price would have fallen by the change in single bidding times the CEE premium: about 1.7 log points in 2016–2020 and 2.8 in 2021–2023. The observed falls are 3.2 and 4.0 times as large, which is consistent with lower relative prices beyond the removal of single-bid awards alone.

If stricter controls had instead made pre-tender estimates more generous, relative prices would also have fallen among single-bid awards, where more competition cannot lower them. From 2021 they did not: among single-bid awards the coefficients average +4.1 log points in 2021–2023, against +4.0 in 2010–2013, while among awards with two or more bids they average −12.6, against −1.2 (Table S3). In 2016–2020, however, relative prices of single-bid awards were also lower than in 2010–2013 (−1.5 against +4.0 log points), so for that period more generous estimates cannot be ruled out. Three further caveats apply. Relative prices are observed for a shrinking share of Hungarian EU-funded awards: relative to national awards and the region, the probability that an award reports both values changed by −12.8 pp in 2016–2020 and −20.0 pp in 2021–2023, against −4.7 pp in 2010–2013, so the price comparison rests on a changing subset of awards. The share of EU-funded awards made on price alone rose somewhat

Table S2: Mechanisms: bidder numbers, cancellation, composition and control of national procurement

A. Hungary × EU-funded × year, mean coefficients (reference 2014)	2010–13	2016–20	2021–23
Single bid	−0.2	−12.7	−21.0
Log number of bids ×100, ≥2 bids	+12.3	+15.9	+26.7
Number of bids (capped at 20)	+0.32	+0.83	+1.67
Exactly two bids	−5.3	−3.6	−4.3
Three or more bids	+5.6	+16.3	+25.3
Four or more bids	+11.8	+15.7	+26.0
Price-only award criterion[a]	−0.4	+7.5	+7.0
Call without a reported award[b]	−4.1	−0.2	−0.9
Log days from call to award ×100[b]	−16.0	−15.9	+0.1
Contract is EU-funded (HU vs CEE, within buyer)	−4.7	−6.0	−5.3

B. Nationally funded contracts, Hungary vs other CEE, mean coefficients (reference 2021)	2016–20	2022	2023–26
Single bid	−1.5	−4.5	−12.9
Exactly two bids	+0.9	+5.3	+8.7
Three or more bids	+0.6	−0.8	+4.2
Log number of bids ×100, ≥2 bids	+1.0	−2.2	+2.2
Call without a reported award[c]	+0.4	+7.1	–

C. Hungary: control of nationally funded procurement, change relative to 2010–14 (pp)	2016–20	2021–23
All buyers		
EU–national gap, central-government buyers	−16.4 (6.0)	−20.7 (10.9)
additional change, local governments	−4.3 (6.5)	+4.5 (10.1)
Nationally funded: central minus local buyers	+6.6 (5.4)	+1.2 (6.3)
Buyers whose type never changes		
Nationally funded: central minus local buyers	−1.2 (17.2)	+9.3 (17.6)

Notes: Outcomes in pp unless stated. Panel A: specification of equation (1); the EU-funded share is estimated within buyers with the fixed effects of equation (1) other than those involving EU funding. [a] TED CSV awards, 2010–2023. [b] Calls for competition published in 2010–2022, linked to their award notices; one observation per call, same fixed effects. Panel B: difference-in-differences for nationally funded contracts, Hungary vs the other CEE countries. [c] Nationally funded calls for competition published in 2010–2022, linked to their award notices; buyer, CPV division × year, procedure and contract-type fixed effects; later calls cannot be linked. Panel C: Hungarian awards of central-government and local-government buyers; within-buyer models with buyer, CPV division × year, value decile × year, procedure and contract-type fixed effects, notice-weighted, standard errors clustered by buyer in parentheses. Under Government Decree 320/2015, the nationally funded procurement of central-government bodies was centrally controlled from November 2015 to October 2020; that of local governments never was. Year-by-year estimates are shown in Supplementary Figure S10.

(+7.5 pp in 2016–2020 and +7.0 pp in 2021–2023, imprecisely estimated), so part of the fall may reflect award criteria that give less weight to quality. And relative prices measure prices at award, not costs after execution.

Table S3: Single bidding and relative prices (value at award / estimated value, 100× log points)

A. Price premium of single-bid contracts (within buyer, market and year)	Estimate	Std. error	Awards
All CEE	+13.19	0.23	1,836,656
Hungary	+8.76	0.57	47,788
B. Triple difference for relative prices, HU × EU-funded (mean coefficients, reference 2014)	2010–13	2016–20	2021–23
Relative price, all awards	−0.5	−5.3	−11.1
single-bid awards only	+4.0	−1.5	+4.1
awards with two or more bids	−1.2	−4.1	−12.6
Relative price observed (pp)	−4.7	−12.8	−20.0

Notes: Awards with a ratio of contract value at award to estimated value between 0.2 and 2. Panel A: fixed effects for buyer, country × year (year for Hungary), CPV division × year, value decile × year, procedure, contract type and buyer type, 2010–2026; notice-weighted; standard errors clustered by buyer. Panel B: specification of Figure 1 of the main paper for relative prices, 2010–2023, on all awards with a relative price and separately on single-bid awards and on awards with two or more bids; the last row is the probability that an award has a relative price (all competitive awards, 2010–2023).

S2.3.4 Nationally funded procurement and the 2022 rules

From 2022, when Hungary committed to national targets and introduced consultation-or-two-tenders requirements for selected above-threshold procedures, national single bidding fell relative to the region (Figure S2): the coefficients average −12.9 pp in 2023–2026 relative to 2021 and −12.1 pp relative to 2010–2013, so the fall is not a return from an unusual 2021. The narrowing of the triple difference after 2023 reflects this national improvement, not a deterioration of EU-funded procurement.

The national improvement was of a different kind from the EU-funded one (Table S2, Panel B). Relative to the region, the coefficients for exactly two bids average +8.7 pp in 2023–2026 and those for three or more bids +4.2 pp, while the number of bids among contracts with several bids did not change (+2.2 log points). Most of the fall went to the minimum that the two-tender rule requires, a pattern compatible with both genuine second bids and supporting tenders, of which the Integrity Authority warned (Integrity Authority 2025b). Procedures without a reported award also became more common during the commitment and selectively covered rule period. In 2022, the first year of that period, the share of Hungarian nationally funded calls that ended without a reported award changed by +7.1 pp (standard error 1.6) relative to 2021 and the region, against an average of +0.4 pp in 2016–2020. The rise appears in calls published in the first half of 2022 as well as in the second (in raw shares relative to the region, +6.1 and +8.0 pp against the same half of 2021), so it does not reflect award notices that appeared only after the switch to eForms. If the additional procedures without reported awards had all been single-bid procedures, their removal alone would have lowered national single bidding among awards by about 4.3 pp, close to the observed change of −4.5 pp that year. EU-funded calls in Hungary also ended more often without a reported award in 2022 (+7.5 pp, standard error 2.8), when

Hungary had committed to keep EU-funded single bidding below 15%. The linked calls end in 2022, so later cancellations cannot be measured in the same way.

An earlier extension of procedural control provides a separate, less precise comparison. From late 2015 to 2020, the nationally funded procurement of central-government bodies was controlled in much the same way as EU-funded procurement; that of local governments was not. In the full sample, single bidding in the controlled national procurement of central-government bodies did not fall relative to local governments' national procurement (+6.6 pp, standard error 5.4; Table S2, Panel C). But central-government buyers changed in 2012–2013, when schools and hospitals were transferred from local governments to central maintainers, and among buyers whose type never changes the estimate is too imprecise to be informative. The test therefore has little power: we find no evidence that national control lowered single bidding, but cannot rule out that it did. Nor can the data say which feature of the EU-funded regime mattered. Because the triple difference removes whatever EU funding brings in all CEE countries, including the Commission's audits and financial corrections, it attributes to Hungary only what was specific to its treatment of EU-funded procurement: the control regime as a whole, or scrutiny by the Commission directed at Hungary (Nyikos and Soós 2017; European Commission 2022).

S2.3.5 Inference and robustness

Table S4 and Figure S3 summarise inference with one treated country. When each of the other CEE countries is treated as if it were Hungary, on samples that exclude Hungary, the average triple-difference coefficient for 2016–2023 ranges from −9.0 to +12.8 pp. Hungary's (−15.8 pp) is the most negative of the 11, a rank fraction of 0.09, the smallest possible, and from 2019 to 2023 Hungary's coefficient is below that of every placebo country in every year (Figure S3a). Subtracting the extreme placebo estimates gives a descriptive range of −28.6 to −6.7 pp; calibrated coverage is not established for this asymmetric fitting procedure. The next most negative placebo is Slovakia's (−9.0 pp), which also controlled EU-funded procurement; excluding Slovakia from the comparison group moves the Hungarian estimates by less than half a point. Aggregated to country-year gaps, synthetic difference-in-differences gives −14.0 pp in 2016–2020 and −19.2 pp in 2021–2023 (placebo standard errors 3.9 and 6.9), and synthetic control gives −9.8 and −12.5 pp. On the nine-country balanced panel, Hungary ranks first under synthetic difference-in-differences in both windows, and first in 2016–2020 and second in 2021–2023 under synthetic control. Synthetic difference-in-differences spreads its unit weights evenly (0.09 to 0.15), whereas synthetic control relies mainly on Poland (0.45), Czechia (0.36), Lithuania (0.19) (Figure S3b). The time weights of synthetic difference-in-differences, however, fall on Hungary's high pre-period years: 0.36 on 2012 and 0.50 on the 2015 outlier for 2016–2020, and 0.84 on 2015 for 2021–2023. With 2010–2014 as the pre-period, the estimates are −11.3 pp (5.5) and −14.6 pp (10.1), still the most negative of the nine countries, but the second is no longer significant at conventional levels.

The main limit of the design is its sensitivity to trends. In the pooled triple difference the pre-

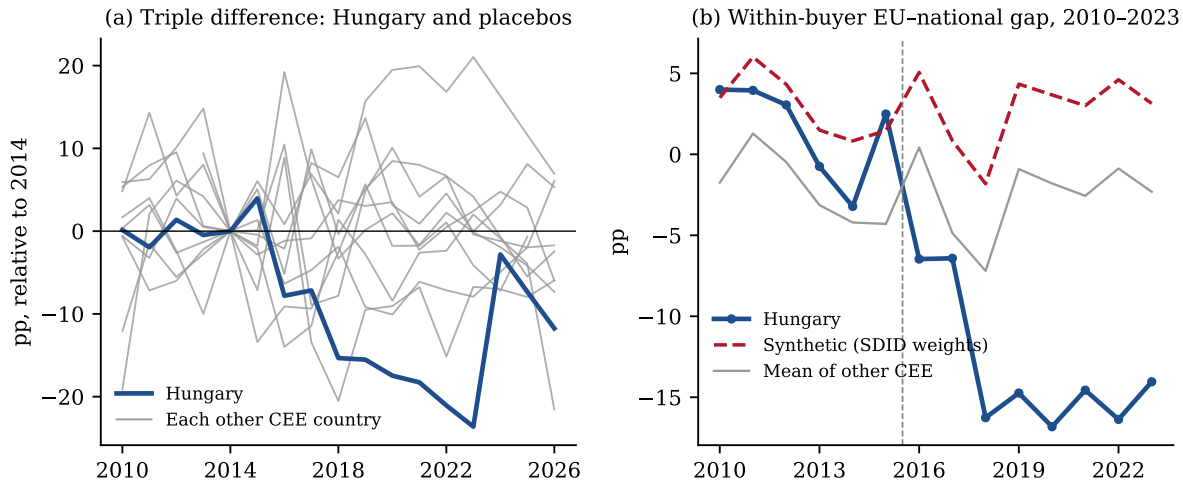


Figure S3: Inference with one treated country. (a) Triple-difference coefficients (equation (1), relative to 2014) for Hungary and, in grey, for each other CEE country treated as if it were Hungary on samples without Hungary. (b) Within-buyer EU–national single-bid gap for Hungary, for the synthetic comparison built with synthetic difference-in-differences weights (aligned with Hungary over the pre-period with the time weights), and for the mean of the other CEE countries; pre-period 2010–2015.

period is flat, and removing a linear trend fitted to its pre-period coefficients leaves the estimates unchanged (−13.1 pp, standard error 5.8, in 2016–2020 and −21.9 pp, 9.4, in 2021–2023). The country-level series tell a different story. Relative to the average of the other countries, Hungary's within-buyer gap was already falling by about 0.98 pp a year over 2010–2014, mostly in 2013–2014 (Figure S3b). If this decline is extrapolated as a linear trend, the effect falls to −6.5 pp in 2016–2020 and −6.3 pp in 2021–2023, and Hungary's rank among the 9 countries falls to 2 and 3 respectively; such extrapolations from five noisy years are themselves fragile, as the wide spread of the placebo countries shows. In the illustrative relative-magnitudes calculation inspired by Rambachan and Roth (2023), the approximate intervals exclude zero only if changes in the differential trend after 2015 are smaller than about half ($\bar{M} = 0.48$ and 0.50) the largest change between consecutive pre-period coefficients (3.3 pp). Counting 2015 as a pre-period year lowers these values to 0.40 and 0.42, and using the spread of the placebo estimates instead of the clustered standard errors lowers them to 0.10 and 0.24. These are sensitivity diagnostics rather than formal robust confidence sets, because uncertainty in the estimated pre-period change is not propagated. Two readings of the 2013–2014 decline are possible. If it was a trend that would have continued, most of the estimated effect is not attributable to the 2014–2020 regime. If it was the ex-ante controls of 2012–2014 beginning to work, 2014 is already partly treated and the estimates understate the effect of control; but then the pre-2014 controls were not ineffective. The data cannot tell these readings apart, so the evidence rests on the size, timing and consistency of the change more than on its statistical significance.

Table S5 re-estimates the main models in further specifications: without notice weights, without tenders with 50 or more awards, without Czechia and Slovenia (whose TED reporting shows breaks), without Poland (the largest comparison country) or Slovakia, without the "other

multiple-stage" procedures that appear only in eForms, relative to 2010–2013, and with buyer × EU-funding fixed effects. Across the baseline and the first six of these, the triple difference ranges from −16.1 to −10.1 pp in 2016–2020 and from −24.9 to −20.8 pp in 2021–2023, and the post-2022 improvement in nationally funded contracts from −13.9 to −9.9 pp. Only the unweighted estimates and those without Poland show a noticeable pre-period deviation (means −3.2 and −3.1 pp). Buyer × EU-funding fixed effects give larger estimates with a flat pre-period, as discussed in Section 5.1 of the main paper. Weighting by contract value changes the picture only through the reference year. With value weights, EU-funded contracts still became markedly more competitive relative to the region (−19.6 pp in 2016–2020 and −26.3 in 2021–2023). The value-weighted triple difference is small relative to 2014 (+6.1 and −0.8 pp), but 2014 was a spike year for large nationally funded contracts; relative to 2010–2013 it is −10.7 pp in 2016–2020 and −17.6 pp in 2021–2023, close to the baseline though imprecise, with yearly standard errors of 6–10 pp. The largest contracts therefore point the same way as the typical tender, with less precision.

Table S4: Inference with one treated country

A. Country placebo comparisons (Hungary excluded from placebo samples)			
Hungary's mean coefficient, 2016–2023	−15.8		
Placebo range, ten other CEE countries	[−9.0, +12.8]		
Rank of Hungary; rank fraction	1 of 11; 0.09		
Placebo-error range (descriptive)	[−28.6, −6.7]		
B. Country-level estimators, within-buyer EU–national gap (placebo standard errors)			
	2016–2020	2021–2023	2016–2023
Synthetic difference-in-differences	−14.0 (3.9)	−19.2 (6.9)	−16.1 (5.0)
Synthetic control	−9.8 (4.3)	−12.5 (8.4)	−10.8 (5.7)
Difference-in-differences	−13.0 (5.9)	−16.8 (8.8)	−14.4 (6.9)
Synthetic DiD, pre-period 2010–2014	−11.3 (5.5)	−14.6 (10.1)	−12.5 (7.3)
DiD net of linear country trends [rank]	−6.5 [2]	−6.3 [3]	−6.4 [3]
C. Sensitivity to pre-trends, triple difference			
	2016–2020	2021–2023	
Baseline	−12.7 (3.2)	−21.0 (4.0)	
Linear pre-trend removed	−13.1 (5.8)	−21.9 (9.4)	
Breakdown $\bar{M}$, relative magnitudes	0.48	0.50	
2015 counted as a pre-period year	0.40	0.42	
placebo standard errors	0.10	0.24	
Joint test, 2010–2013 coefficients (p)	0.93		

Notes: Panel A: equation (1) re-estimated with each other CEE country as the treated unit, on samples without Hungary; the descriptive placebo-error range is Hungary's estimate minus the largest and smallest placebo estimates. The asymmetric estimation samples and non-random exposure do not establish calibrated rank probabilities or confidence coverage. Panel B: units are the 9 CEE countries with observed gaps throughout 2010–2023 (Croatia lacks pre-accession data and Estonia's 2013 bid coverage is below the design threshold); outcome is the yearly within-buyer EU–national single-bid gap of each country; pre-period 2010–2015 unless stated, treatment from 2016; standard errors from placebo re-estimation with each control country treated (Arkhangelsky et al. 2021). The last row removes from each country's difference to the mean of the others (Hungary excluded for the placebo countries) a linear trend fitted over 2010–2014; rank among these 9 countries in brackets, 1 = most negative. Panel C: standard errors in parentheses (clustered by buyer); the linear pre-trend is fitted to the 2010–2014 coefficients and extrapolated; $\bar{M}$ is the largest multiple of the biggest change between consecutive pre-period coefficients that post-period changes in the differential trend can take before the 95% interval includes zero, treating that change as known (an approximation to Rambachan and Roth 2023); the two variants count 2015 as a pre-period year and replace the clustered standard error with the standard deviation of the placebo estimates in Panel A.

Table S5: Robustness of the Hungarian estimates (mean event-study coefficients, pp)

	Triple difference: HU × EU-funded				National
	2010–13	2016–20	2021–23	2024–26	2023–26
Baseline (notice-weighted)	−0.2	−12.7	−21.0	−7.3	−12.9
Unweighted	−3.2	−10.1	−22.8	−1.5	−9.9
Value-weighted	+16.6	+6.1	−0.8	+12.0	−16.6
Excluding notices with 50+ awards	−0.0	−12.5	−20.8	−7.1	−13.0
Excluding Czechia and Slovenia	+0.4	−12.9	−21.3	−7.0	−13.1
Excluding Poland	−3.1	−16.1	−24.9	−8.8	−13.9
Excluding Slovakia	−0.1	−12.9	−21.4	−7.6	−12.9
Excluding 'other multiple-stage' procedures	−0.2	−12.7	−21.0	−7.2	−13.0
2010–2013 pooled as reference	–	−12.4	−20.8	−7.1	−12.1[a]
Value-weighted, 2010–2013 pooled as reference	–	−10.7	−17.6	−4.7	−7.2[a]
Buyer × EU-funding fixed effects	−0.1	−17.2	−24.0	−10.2	–

Notes: Means of yearly event-study coefficients; reference year 2014 for the triple difference and 2021 for the national-contract comparison (last column). Value weights: contract size (estimated value, else final value), capped at the 99.9th percentile; 2014 was a spike year for large nationally funded Hungarian contracts, so the value-weighted estimates are also shown against 2010–2013. Buyer × EU-funding fixed effects replace the buyer and country × EU-funding effects of equation (1), so each buyer has its own EU–national difference. [a] Relative to 2010–2013 rather than 2021.

S3 Procedures closed for want of a second admissible tender

The two-tender rules let buyers announce that a procedure receiving fewer than two tenders will be unsuccessful (Section S1.3). A single-bid procedure closed in this way leaves the denominator of the single-bid indicator, which counts awarded procedures only. The calls linked to award notices in Section S2 end in 2022. From October 2023, eForms contract award notices record, for every lot closed without a winner, the number of tenders received and a coded non-award justification. The code 'one-admis' means that 'only one admissible tender, request to participate or project was received' (Publications Office of the European Union 2026a).

Data. The Hungarian count uses all eForms contract award notices published in TED from October 2023 to 8 May 2026, read from the notice XML. As in the main designs, it keeps lots in competitive procedures without framework agreements or dynamic purchasing systems and weights each lot result by 1/lot results in its notice. For the other ten countries, the search-API extract used in the main designs reports the number of tenders but not the reason, so the benchmark is the share of lots closed after exactly one tender. Both Hungarian sources give identical counts of lots closed after one tender in every year.

Results. In 2024, Hungarian buyers closed 419 nationally funded lots in 170 award notices because only one admissible tender had arrived, 3.9 per cent of national lot results; in 2025, 355 lots in 118 award notices (3.5 per cent). Of the 1,063 lots coded 'one-admis' over the whole period, 1,041 had received exactly one tender. Counting the closures as single-bid outcomes raises national single bidding from 33.7 to 36.6 per cent in 2024 and from 24.3 to 27.4 per cent in 2025 (Table S6). EU-funded procurement shows similar closure rates: 91 lots in 60 award notices in 2024–2025, 4.3 per cent of EU-funded lot results, which lift EU-funded single bidding by +3.6 and +4.6 points in the two years.

Not every closure after a single tender is a two-tender closure. Of the 1,514 Hungarian lots closed after exactly one tender, 69 per cent are coded 'one-admis'; others cite the rejection of the only tender (214 lots) or insufficient funds (186). Closures after one tender were more frequent in Hungary than in the other countries combined (5.3 against 3.4 per cent of national lot results in 2024–2025), but not exceptional: Latvia reports 5.5 per cent. Through the last complete quarter, 2026Q1, the Hungarian share of national lots closed for one admissible tender stayed between 3.0 and 4.4 per cent (Figure S4), with no clear step after the rule was extended to most procedure types in March 2024.

Limits. The eForms records begin in October 2023, after the national rule took effect, so they show the scale of closures under the rule but not the change it caused. The older TED CSV format records non-award outcomes for only 3.8–6.5 per cent of Hungarian national lot results in 2016–2023, against 16.6–19.6 per cent in eForms in 2024–2025, which points to under-reporting rather than a sudden rise; pre-2024 comparisons of closures are therefore unreliable. TED covers

Table S6: Procedures closed for want of a second admissible tender, eForms notices, October 2023 – 8 May 2026

	Lots awarded	Lots closed	Closed for one admissible tender	Share of lot results (%)	Single-bid share of awarded lots (%)	With closures counted (%)
A: Hungary, closures coded 'only one admissible tender' (BT-144 one-admis)						
National, 2023 (Oct–Dec)	1,012	443	40	4.3	27.2	30.9
National, 2024	6,610	1,498	419	3.9	33.7	36.6
National, 2025	4,074	1,555	355	3.5	24.3	27.4
National, 2026 (to 8 May)	1,643	470	126	3.8	28.9	32.1
EU-funded, 2023 (Oct–Dec)	267	72	10	4.5	8.6	13.5
EU-funded, 2024	975	241	48	4.1	26.0	29.6
EU-funded, 2025	751	229	43	4.4	13.1	17.7
EU-funded, 2026 (to 8 May)	358	124	22	3.5	14.2	18.0
B: 2024–2025, closures after exactly one tender (no reason codes in the API extract)						
Hungary, national	10,673	3,044	1,039	5.3	29.7	34.0
Other CEE, national	378,086	100,678	14,430	3.4	45.5	47.9
Hungary, EU-funded	1,723	470	126	5.5	19.7	25.0
Other CEE, EU-funded	45,155	17,717	2,402	4.1	37.2	40.7

Notes: Lot results in competitive procedures (open, restricted, negotiated with call, competitive dialogue, innovation partnership, other multiple-stage), without framework agreements or dynamic purchasing systems, in eForms contract award notices published in TED. Panel A: Hungarian notice XML; the fourth column counts lots closed without a winner whose non-award justification is 'only one admissible tender, request to participate or project was received'. Panel B: TED search-API extract for the eleven countries; the fourth column counts lots closed without a winner after exactly one tender, whatever the reason. Shares are weighted by 1/lot results per notice. The last column adds the counted closures to the single-bid awards; it is an upper bound on single bidding had those lots been awarded to their only bidder. TED covers procedures above the EU thresholds. Source: TED eForms; own calculations.

procedures above the EU thresholds, and the shares are computed on a different basis from the official national series, so they cannot be compared with the targets. Closed procedures may be relaunched, sometimes with the same bidder; the notices do not link relaunches to their predecessors.

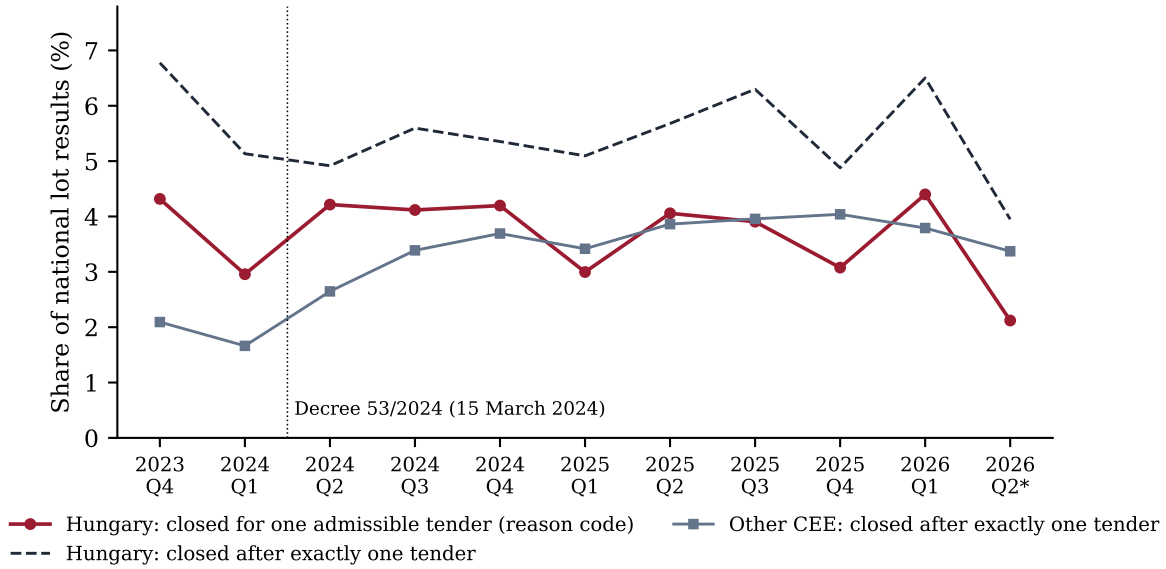


Figure S4: Nationally funded lots closed without a winner because only one admissible tender arrived (Hungary, eForms reason code) and lots closed after exactly one tender (Hungary and the other ten countries), by quarter, October 2023 – 8 May 2026 (* to 8 May). Shares of national lot results in competitive procedures, weighted by 1/lot results per notice. Source: TED eForms; own calculations.

S4 Recipient accounting and supporting evidence

This section provides the detailed construction, recipient breakdowns, validation and channels supporting Section 5.3 of the main paper. All procurement amounts are contract commitments unless expressly described as reported payments or final-accounts outturns. The additional state transactions measure different quantities and are kept separate.

S4.1 Data and accounting

We requested all 143,106 registry records for procedures from 2018 onwards through EKR's public interface on 30 September and 1 October 2026; all but two, which returned server errors, were retrieved. The value frame counts procurement contracts, including call-offs under framework agreements and dynamic purchasing systems, at their net value at signature, with gross-only entries converted at an assumed 27% VAT rate. Framework agreements set ceilings rather than purchases: their EUR 47.8 billion in 2018–2025 is kept separate and never added to spending, and in-house awards are excluded. Two kinds of registry entries would count money twice. We drop 4,019 duplicate registrations (EUR 1.6 billion), mostly contracts migrated from the earlier registry and registered again when they were closed or amended, and we treat as unknown the value of 50 call-offs registered at their framework's full ceiling although the framework has other call-offs (EUR 2.6 billion as registered); sixteen regional guarding call-offs of the state railway, for instance, each carry the HUF 24.5 billion ceiling of their framework. A consortium's contract is split equally among its members, the convention of Transparency International Hungary (2026), with allocation to the lead contractor as a check. Planned

subcontracts and reported payments are later destinations of the same money and are not added to it. For 2018–2025 the frame contains 119,122 contracts worth EUR 67.3 billion, 84% of it in EU-regime procedures. The year 2018 is incomplete because the registry started then. The analysis covers the Fidesz-led governments, whose last term ended when Parliament elected Péter Magyar prime minister on 9 May 2026 (Government of Hungary 2026); contracts decided from that date are excluded, so 2026 covers decisions of January to 8 May. Concession contracts are also excluded, because their registered values estimate the operator's turnover rather than public purchases (Section S4.6). Supplementary Section S10 documents the construction, and Supplementary Figure S14 shows the value by award channel and recipient type.

Registry values are entered by buyers, so we checked them against TED. For 10,600 contracts that are the only award of a procedure published in TED, the ratio of the registry value to the TED award value has a median of 1.00 and an interquartile range of 0.92–1.00. The 11 contracts whose registry value exceeds the TED value more than tenfold, typically forint amounts entered as euros, take the TED value, and 5 implausible values among contracts above HUF 100 billion are corrected or excluded; each case is documented in the replication files. The frame then reproduces the published aggregates. For 2024 it totals HUF 3,725 billion, against the HUF 3,740 billion of direct contracts that the Integrity Authority reports from EKR's result notices (Integrity Authority 2025a), and in 2020–2025 its annual value is 0.82–1.05 times, and its number of contracts 0.90–1.11 times, the Authority's totals for procedures that do not conclude a framework agreement (Integrity Authority 2026). Individual firms awarded ordinary contracts also match closely, while firms whose awards are mainly shares of multi-supplier framework agreements do not, because we do not count ceilings (Supplementary Table S19). The registry is not complete, however. Of the EUR 25.3 billion of Hungarian TED awards of EUR 20 million or more in 2018–2023, awards carrying 70% of the value have a registry counterpart. The missing EUR 7.5 billion falls mostly in 2018 and 2019, when procedures begun before EKR became mandatory were still being concluded, and it includes the Budapest–Belgrade railway and a HUF 338 billion railway contract awarded to V-Híd in 2021. Section S4.5 therefore also uses TED for the long run. Supplementary Table S14 summarises the verification of the registry analysis, including an independent re-implementation from the raw records.

Recipients are identified by the eight-digit root of their tax number (13,546 entities in 2018–2025) and grouped in three ways that measure different relationships. First, the ninth digit of a Hungarian tax number marks members of a VAT group, whose EU VAT number is the group identifier. Only related enterprises, in essence firms under common majority influence, may form a VAT group (Parliament of Hungary 2007), so a shared identifier is a legal, dated indicator of common control; it is, however, recorded in usable form for few contractors. For the 4 groups that matter most here, those of Duna Aszfalt, Strabag, MOL and MBH Bank, we take the 91 member companies and their joining dates from the tax authority's public register (Nemzeti Adó- és Vámhivatal 2026) and merge each member from the date it joined. Second, Transparency International Hungary's Tenderbajnok lists the ultimate owners, mostly holders of

at least 25%, of procurement-dependent firms in yearly snapshots for 2021–2023 (Transparency International Hungary 2026). We merge firms that share a principal owner in the snapshot nearest to the contract year, a grouping comparable to the Integrity Authority's owner groups rather than verified majority control. Firms matched to an ownership snapshot receive 61% of contract value. Third, for political affiliation we use the 63 companies, with tax numbers and dated periods, that Corruption Research Center Budapest (2026a, Annex A3) associate with named "top actors" through ownership, family or business ties, and a broader actor-linked set that adds firms whose principal Tenderbajnok owner is one of those actors and dated VAT-group members of linked firms. CRCB gives each company's current tax number. A company that changed its legal form, such as Duna Aszfalt's earlier limited company, appears in the registry under an earlier number, so we add 8 predecessor and same-name entities of the listed companies, which CRCB's own contract data flag; with the listed tax numbers alone, the 2018–2025 share below is 16.6 rather than 18.8%. Listed companies absent from Tenderbajnok join the group of their listed parent or CRCB-named actor as an association-based fallback. Such assignments are not independently verified common ownership; the reported owner-linked grouping therefore includes both ownership and association links. Neither set is a complete classification of political connections, and the selection of names is CRCB's.

Share denominators. Recipient shares divide allocated value by all value assignable to a contracting party, not by every value-frame record. In 2018–2025, 652 contracts carrying EUR 243.396 million lack an assignable recipient, leaving EUR 67.022 billion allocated from the EUR 67.266 billion frame. The listed share is 18.779% of allocated value, versus 18.711% of full frame value. The 2021–2023 funding cells have no such unallocated value. Annual concentration likewise uses allocated value; these are accounting shares, not estimates of personal receipts.

S4.2 Concentration and the largest recipients

Contract value became markedly more concentrated. The ten largest legal entities received 26.1% of contract value in 2019, 39.0% in 2024 and 36.5% in 2025. Under the owner/association grouping, the ten largest received 29.3, 43.7 and 40.7% (Figure S5). The 2024 values are close to the Integrity Authority's 38.3% for firms and 44.0% for owner groups. The 2025 values depend on two contracts for gas-fired power plants; without them the shares are 26.6 and 31.7%, nearer the Authority's 22.8 and 26.8% (Integrity Authority 2026). From 2019, owner grouping adds between three and eleven points a year, so part of the dispersion across legal entities is dispersion within the same owner/association groups. In January to 8 May 2026 the shares were 24.3 and 32.4%.

Over 2018–2026 the largest recipient group is the ownership circle of Lőrinc Mészáros (EUR 4.2 billion), followed by that of László Szíjj (3.6), the state-owned electricity retailer MVM Next (3.0, mostly energy supply), the circle of Gyula Balásy (2.4), the Hungarian Strabag companies, merged through their VAT group (2.0), MOL (1.8) and the circle of Attila Paár (1.6;

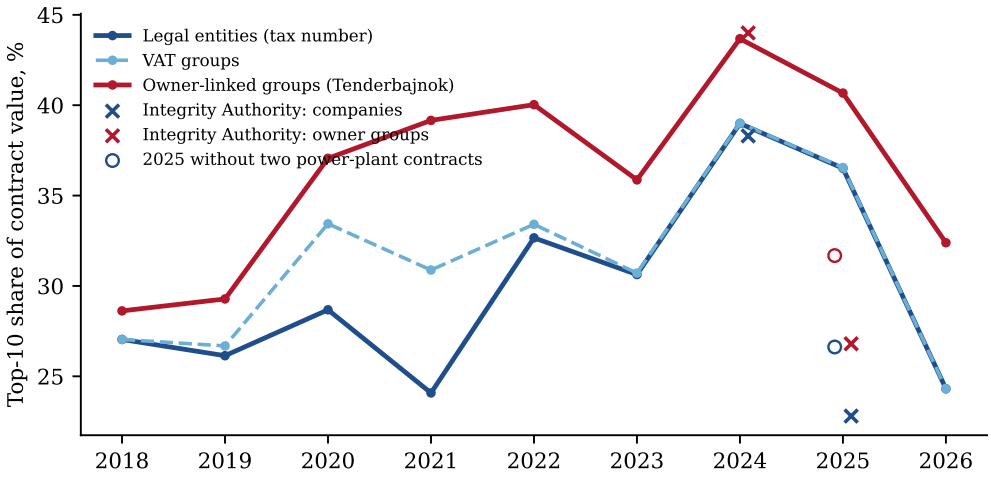


Figure S5: Share of annual contract value received by the ten largest recipients, 2018–2026 (%). Legal entities are tax-number roots; VAT groups merge members of the same VAT group where the group identifier is recorded; owner-linked groups combine principal-owner snapshots, dated VAT links and the stated association fallback for listed firms absent from Tenderbajnok. Crosses: published Integrity Authority figures for 2024 and 2025 (Integrity Authority 2025a, 2026). Open circles: 2025 without two power-plant contracts. Net contract value at signature, consortium values split equally, framework ceilings excluded; 2018 is incomplete and 2026 covers contracts decided before 9 May. Source: EKR contract registry; author's calculations.

Figure S6). Public bodies and publicly owned companies received 10.0% of 2018–2025 contract value, firms without a Hungarian tax number 4.9%, and consortia 23.2%. The CRCB-listed companies received 18.8%, and 19.8% together with the broader actor-linked firms. These groupings describe ownership and published associations; they do not establish that any award was improper.

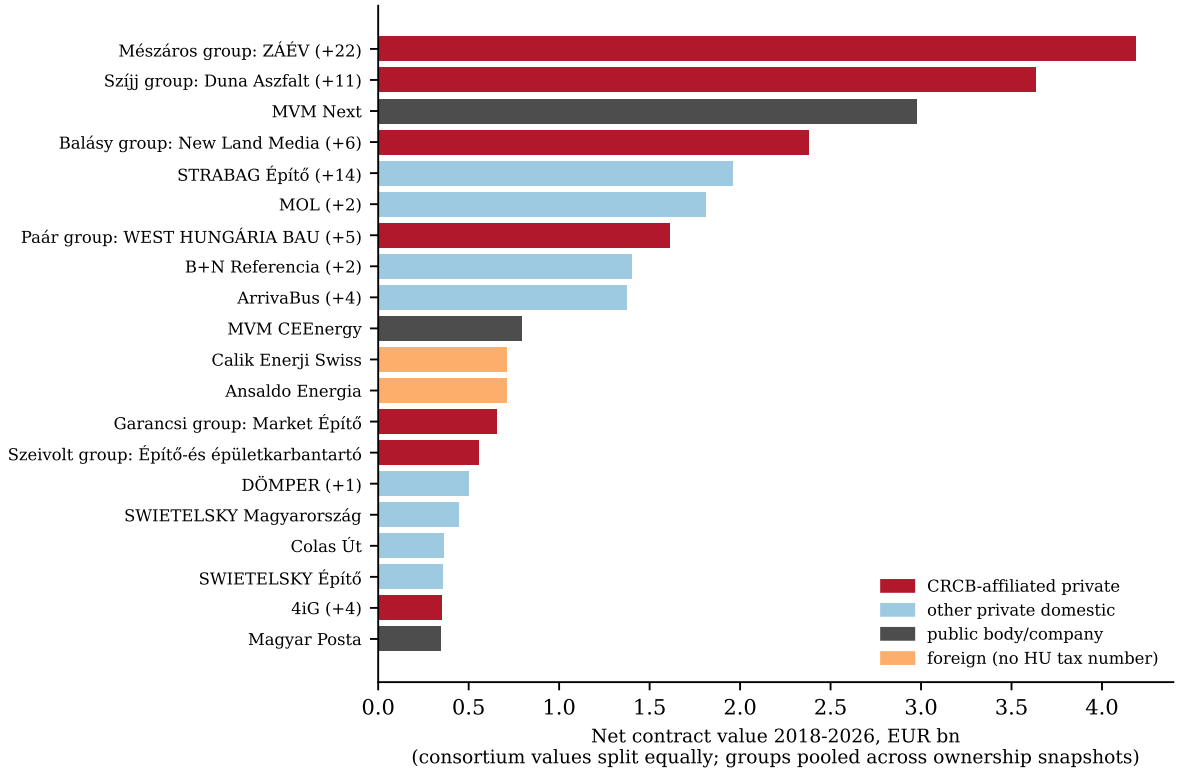


Figure S6: The twenty largest recipient groups, 2018–2026 (EUR billion). Groups combine principal-owner snapshots, dated VAT links and disclosed parent/actor association fallbacks; the number in parentheses counts further legal entities. Owner names are shown only where the same person is named by Corruption Research Center Budapest (2026a) or the Integrity Authority. Colour: recipient type of most of the group's contracts; "CRCB-affiliated" means companies on CRCB's list, with their predecessor and same-name entities, within its stated periods. Net contract value at signature, consortium values split equally, framework ceilings excluded. Source: EKR contract registry, Tenderbajnok; author's calculations.

S4.3 Recorded competition and affiliated recipients

The registry links to bid counts through published notice numbers. 44,792 contracts, carrying 78% of EU-regime value, link to the TED awards used in our main design, and 73,448 contracts of both regimes link by notice and winner name to the national-register bid counts of Corruption Research Center Budapest (2026b). Within buyer–year cells and CPV divisions, contracts won by CRCB-listed companies were not measurably more or less often single-bid than other contracts (−2.4 pp, standard error 2.8, with TED bids; 4.2 pp, standard error 2.4, with national-register bids; Table S7, Panel B). The estimates do not resolve a differential association with EU funding (−1.3 and −3.3 pp), whereas EU-funded contracts of the same buyer and year were less often single-bid (−6.4 and −8.7 pp), the within-buyer gap on which our main design rests. The broader actor-linked classification gives the same pattern. Across 8 specifications that vary the affiliation list, clustering, fixed effects, sample, EU-funding flag and outcome, the affiliated coefficient ranges from −5.4 to 4.9 pp, with opposite signs in the two bid sources and no $|t|$ above 1.9, while the EU-funding coefficient stays between −11.3 and −5.5 pp (Supplementary

Section S10).

Who won did differ by funding source. In EU-regime procedures of 2021–2023, when EU-funded single bidding was lowest relative to the region, CRCB-listed companies received 31.0% of EU-funded contract value and 19.4% of nationally funded value; with actor-linked firms the shares are 36.9 and 20.0% (Panel A). The gap holds under each of the 8 alternative accounting choices of Supplementary Section S10, with EU-funded shares of 25.0–37.1% against national shares of 15.9–21.4%. In 2018–2020 the two shares were similar (25.6 and 24.9%), and after 2023, when EU funding was restricted, the EU-funded share fell to 8.5%. Supplementary Figure S15 shows the annual shares for all procurement regimes and the actor families behind them. Recorded competition therefore provides no statistically resolved distinction between affiliated and other recipients, and the years of the largest fall in EU-funded single bidding were also years in which a larger share of EU-funded money went to them. This fits the concern of Section 2.2 of the main paper that more bids and a continued advantage in allocation can coexist. The shares cannot, however, separate favouritism from the specialisation of large construction groups in the EU-funded infrastructure of those years.

Table S7: Affiliated recipients in EU-threshold procedures: value shares and recorded competition

	2018–2020		2021–2023		2024–2026	
	EU-funded	National	EU-funded	National	EU-funded	National
A. Share of contract value (%)						
CRCB-listed companies	25.6	24.9	31.0	19.4	8.5	20.1
CRCB-listed or actor-linked	26.3	25.4	36.9	20.0	10.1	20.5
Contract value (EUR bn)	2.5	10.8	6.0	20.4	2.1	17.6
B. Single bidding within buyer–year cells (pp)						
	2018–2020		2021–2023		All years	
TED: affiliated	−5.8 (6.8)		3.1 (5.1)		−2.4 (2.8)	
TED: affiliated × EU-funded	0.1 (7.4)		−3.8 (5.4)		−1.3 (3.6)	
TED: EU-funded	−7.6 (4.7)		−8.7 (1.9)		−6.4 (2.2)	
Register: affiliated	4.2 (4.5)		4.9 (4.0)		4.2 (2.4)	
Register: affiliated × EU-funded	−4.3 (6.0)		−3.1 (4.3)		−3.3 (3.2)	
Register: EU-funded	−8.1 (1.9)		−10.0 (1.2)		−8.7 (1.2)	

Notes: EKR contract registry, procedures under the EU-threshold regime, contracts by signing year (2026: contracts decided before 9 May). Panel A: net contract value at signature, consortium values split equally; framework agreements (ceilings) excluded, call-offs included. "CRCB-listed" uses the 63 companies of Corruption Research Center Budapest (2026a, Annex A3) and their predecessor and same-name entities within the stated periods; "actor-linked" adds companies whose principal owner in the nearest Tenderbajnok snapshot is one of CRCB's named actors and dated VAT-group members of linked firms. Panel B: linear probability models of single bidding with buyer × year and CPV-division fixed effects and log contract value; standard errors clustered by buyer in parentheses. TED: share of single-bid awards in the linked TED notice(s); Register: CRCB national-register bid count matched by gazette notice and winner name (both regimes, 2018–2025). Affiliation is CRCB-listed. Descriptive associations, not effects of affiliation or oversight.

S4.4 Channels outside the estimation sample

Several channels that the TED design excludes carry money to the same recipients. Framework call-offs account for 14.6% of 2018–2025 contract value: 7.9% after reopened competition, 5.6% by written consultation among the parties to a framework and 1.1% by direct purchase. Of the EUR 4.1 billion awarded by written consultation, 57% went to CRCB-listed companies and 54% to the Balásy group alone, almost all of it communication, media and event services ordered through the National Communications Office. Contracts of CRCB-listed companies were also amended more often: contracts with a recorded amendment carry 55% of their value, against 29% for other firms, although the value-weighted change on amendment is similar (3.8 and 4.6%).

Contractors planned EUR 3.5 billion of subcontracting. Of this, EUR 0.67 billion was planned for subcontractors whose tax numbers mark VAT-group membership at the same tax office as the prime contractor's. Duna Aszfalt accounts for EUR 0.64 billion, mostly on the M49 motorway and the Mohács Danube bridge, for companies bearing the Duna name. The tax authority's register of VAT groups confirms that they belong to Duna Aszfalt's VAT group (Nemzeti Adó- és Vámhivatal 2026; European Commission 2026e). Duna Útépítő and Duna Hídépítő, for which EUR 0.61 billion of these subcontracts was planned, joined the group on 15 November 2024, establishing their membership of the same group of related enterprises from that date. The registry describes planned destinations, not realised transfers, and does not date every subcontract plan. The register also shows the group absorbing established contractors: Dömper and Pannon-Doprastav, which had won contracts in their own names, joined it on 1 January 2025. Contracts bearing at least one reported payment record carry 36% of full-frame commitment value over 2018–8 May 2026 (38% over 2018–2025). This is coverage of records, not the proportion of commitments known to have been paid, so the registry cannot yet trace execution systematically.

Company accounts add a further step. Among the procurement-dependent firms in Tenderbajnok, whose awards exceed half of their revenue, the 34 CRCB-listed companies reported HUF 842 billion of after-tax profit on HUF 6.4 trillion of revenue in 2018–2023. Their aggregate margin of 13.1% compares with 7.7% for the other 4,368 firms. Within construction, where 18 of them operate, the aggregate margins are 13.1 and 8.3% and the median firm-year margins 10.6 and 6.0%. Profit is a firm-year outcome of all activities, not a return on particular contracts, and it is not a distribution to owners.

S4.5 The longer run, 2010–2026

The registry begins in 2018. To cover all the years of the Fidesz-led governments, from 29 May 2010 to 8 May 2026, we use the most detailed source available for each period: TED's award notices of Hungarian buyers above the EU thresholds for 2010–2023 (European Commission, DG GROW 2024), which name the winners, and the registry's EU-regime contracts from 2024, which identify every party by tax number. TED's eForms notices, which also give the winners'

tax numbers from October 2023 (Publications Office of the European Union 2026b), complete 2023 and serve as a check on the registry for 2024–2026. Framework agreements are excluded as ceilings and concessions as operating rights, as before, and large award values were checked against the notice texts and the registry. Before eForms, CRCB-listed companies and their predecessor entities are identified by name, within the periods CRCB states, and a consortium's award is split equally among the companies it names. Tax numbers show that the names identify these companies reliably. In the 12,046 procedures of 2018–2023 whose TED awards link to registry contracts, the names find 98.5% of the procedures that tax numbers attribute to a listed company, and 99.3% of the procedures they find are confirmed (Cohen's $\kappa = 0.99$). In the 21,145 TED awards of 2016–2023 whose notices give every winner's tax number they are 99.8 and 100.0% ($\kappa = 1.00$), and in eForms notices 99.8 and 100.0%. Applied to CRCB's national-register data, the names agree with CRCB's own flag on 99.7% of awards. In the years they overlap, the annual shares from TED, from the registry and from CRCB's data move together (correlations of 0.82 to 0.89). CRCB's data cover both procurement regimes but include framework ceilings, which carry about 34% of their value in 2018–2025 and cannot be removed before 2018, so they serve only as a comparison (Supplementary Section S10).

From 29 May 2010 to 8 May 2026 the CRCB-listed companies won EUR 20.2 billion, or 17.5%, of the EUR 115.0 billion of contract value above the EU thresholds, and 2.5% of the contracts (Table S8 and Figure S7). Their share of value rose from 8.6% in 2010–2013 and 12.2% in 2014–2017 to 22.6% in 2018–2021 and 20.6% in 2022–2025, with a peak of 28.7% in 2022. Their share of contracts rose from 0.7 to 3.4%: these companies won few contracts, but large ones. The circles changed. Lajos Simicska's companies took 3.4% of value in 2010–2013 and almost nothing from 2015, although CRCB lists them until 2018 or 2019. The circle of Lőrinc Mészáros rose from 1.5% to 10.3% in 2018–2021, while László Szíjj's companies, led by Duna Aszfalt, held between 2.8 and 6.3% in each period. Over the whole period the Mészáros circle received 6.3% of the value (EUR 7.2 billion) and the Szíjj circle 5.0% (EUR 5.8 billion), followed by Balásy (2.1%), Paár (1.9%), Garancsi (1.0%), Tiborcz's circle (0.6%) and Simicska (0.6%). In 2022 the contracts they won above the EU thresholds were worth 1.9% of GDP; contract values are typically spent over several years.

Counting contracts understates their weight. Splitting consortium awards in the same way for both measures, the CRCB-listed companies won 2.5% of the awards with a reported value but 17.5% of their value, so their average award was about 7 times the average (Figure S8). The multiple was 10 for the Mészáros circle (0.64% of contracts, 6.3% of value), 14 for Szíjj, 24 for Paár and 26 for Garancsi, but only 2 for the Balásy agencies, which won many medium-sized communication contracts. The companies took 25% of the value of each year's largest 1% of awards, and 81% of their own value came from such awards. In 7 of the ten largest awards of 2020 a CRCB-listed company was among the winners. By year, the value share was lowest in the first year of each term (9.9% on average in 2011, 2015, 2019 and 2023, against 17.7% in the other years of 2011–2025; Supplementary Table S15 and Figure S11). With four terms,

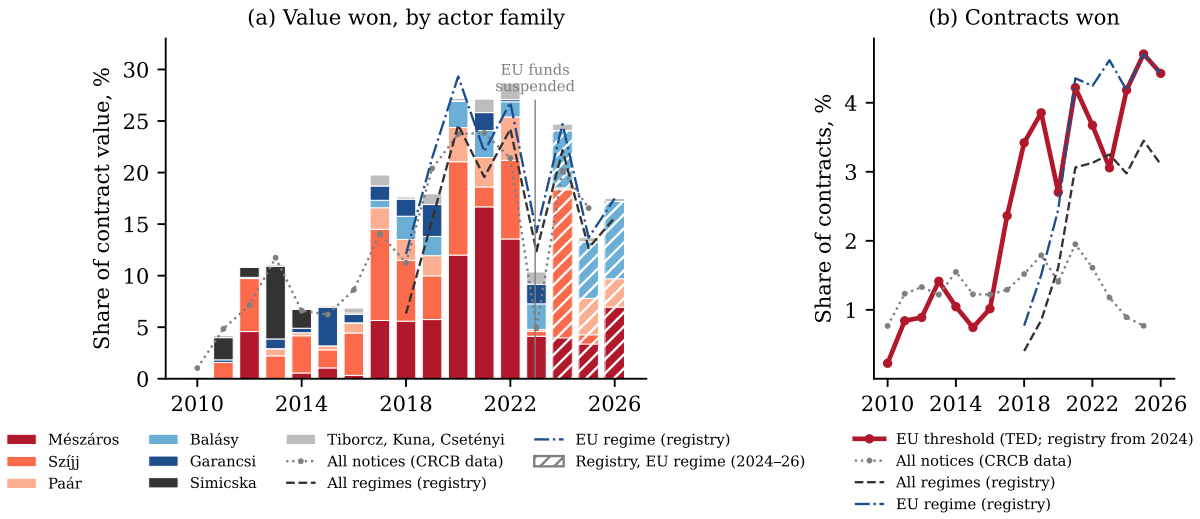


Figure S7: Contracts above the EU thresholds won by CRCB-listed companies, 2010–2026. Panel (a): share of contract value by actor family (bars; TED award notices to 2023, EKR registry EU-regime contracts from 2024, hatched); the dotted line uses CRCB's national-register data for all notices (framework ceilings partly included), the dashed line the registry for all procurement regimes and the dash-dotted line the registry's EU-regime contracts. Panel (b): share of contracts with a CRCB-listed company among the winners. Companies: the 63 companies of Corruption Research Center Budapest (2026a, Annex A3) and their predecessor entities, within CRCB's periods; consortium awards split equally. 2010: from 29 May; 2026: to 8 May. Source: TED, EKR contract registry, Corruption Research Center Budapest (2026b); author's calculations.

however, the evidence for an electoral cycle is weak: among all ways of choosing four of these fifteen years, the fraction of assignments with a gap at least this large is 0.056 (one-sided; 0.114 two-sided), and 0.057 once a linear trend is removed.

The money came from a few buyers. Five of them awarded 64% of the value that the listed companies won (Supplementary Table S16). The National Infrastructure Developer (NIF), which manages state road and rail investment, alone awarded 31% of it (EUR 6.2 billion), and the listed companies' share of NIF's contract value rose from 21% in 2010–2013 to 43% in 2018–2021 and 48% in 2022–2026. They also won 68% of the value awarded by BMSK, the state company that builds sports facilities, and 80% of the value awarded by the National Communications Office.

Figure 4 of the main paper follows the money from the buyers through the winning companies to the actors CRCB names. Of the EUR 20.2 billion that the listed companies won, the two largest links, NIF's contracts with Duna Aszfalt (EUR 3.3 billion) and with the V-Híd companies (EUR 1.5 billion), carried 24%, and the National Communications Office's EUR 2.3 billion went to the Balásy agencies. The companies CRCB associates with Lőrinc Mészáros won EUR 6.6 billion and those of László Szíjj EUR 5.8 billion. Supplementary Figure S12 draws the same flows for the whole registry, 2018–2026: 64% of contract value went to recipients outside the fifteen largest groups, 10% to public bodies and publicly owned companies, and 19% to the

Table S8: Share of EU-threshold contract value won by companies of CRCB's top actors, 2010–2026

	Share of contract value (%)					EUR bn	Contracts (%)
Actor family	2010–13	2014–17	2018–21	2022–25	2010–26	2010–26	2010–26
All CRCB-listed companies	8.6	12.2	22.6	20.6	17.5	20.2	2.49
Mészáros (L. and J. Mészáros, Z. Homlok, G. Jászai)	1.5	2.7	10.3	7.0	6.3	7.2	0.64
Szíjj (László Szíjj)	2.8	5.6	4.9	6.3	5.0	5.8	0.37
Balásy (Gyula Balásy)	0.0	0.3	2.3	3.6	2.1	2.4	1.17
Paár (Attila Paár)	0.3	1.2	2.5	2.3	1.9	2.1	0.08
Garancsi (István Garancsi)	0.4	1.4	1.8	0.4	1.0	1.2	0.04
Tiborcz (I. Tiborcz, E. Hamar, I. Szeivolt)	0.1	0.3	0.7	1.0	0.6	0.7	0.08
Simicska (Lajos Simicska)	3.4	0.4	0.0	0.0	0.6	0.7	0.06
Kuna and Csetényi	0.0	0.2	0.0	0.0	0.1	0.1	0.05
All awards: value (EUR bn)	18.1	23.9	35.6	34.8	115.0		
All awards: contracts	17,930	20,623	34,499	42,048	118,941		

Notes: Contracts of Hungarian buyers above the EU thresholds awarded under the Fidesz-led governments, 29 May 2010 – 8 May 2026: TED award notices to 2023 and EKR registry contracts in EU-regime procedures from 2024. Value: award value reported to TED (registry: net value at signature) in EUR, with large TED values checked against the notice texts; framework agreements and concessions are excluded. Companies: the 63 companies of Corruption Research Center Budapest (2026a, Annex A3) and their predecessor and same-name entities, within the periods CRCB states, identified by name in TED and by tax number in the registry; a consortium's award is split equally among its members. Families group CRCB's named actors as in its Annex A2. "Contracts" is the share of awards with a reported value that the family won, a consortium award counted in proportion to its members as for value. Source: TED, EKR contract registry; author's calculations.

groups of the six actors named there.

The rise does not hinge on a few contracts or on accounting choices (Supplementary Table S18 and Figure S13). Resampling notices independently within years gives 95% percentile intervals of 5–13% for 2010–2013 and 17–29% for 2018–2021. Across the alternatives in this supplement, which include giving consortium awards wholly to listed members or counting only awards won by listed companies alone, dropping each year's ten largest awards, capping values, including framework agreements and using TED's eForms notices for 2024–2026, the 2010–2026 share ranges from 11.7 to 23.0%. In every one of them the 2018–2021 share (at least 14.2%) exceeds the highest 2010–2013 value (13.6%). These resampling intervals describe sensitivity to the observed notice mix; they do not cover entity-linkage uncertainty, missing records or dependence across notices of the same buyer. The annual share rose by 1.3 percentage points a year (Newey–West standard error 0.4), and the mean of 2018–2025 exceeded that of 2010–2017 by 12.5 points (assignment fraction 0.003 when the two periods' year labels are enumerated). Temporal dependence, trend and non-random period assignment prevent interpreting these year-assignment fractions as calibrated randomisation p-values. Most of the rise took place within contract types; shifts in spending across types also contributed. The listed companies' share of works rose from 20% in 2010–2013 to 37% in 2018–2021 and their share of supplies from 0.7% to 10%; of the 14.0 points by which their overall share rose between these periods, 11.1 arose within types and 2.9 from shifts in spending across types.

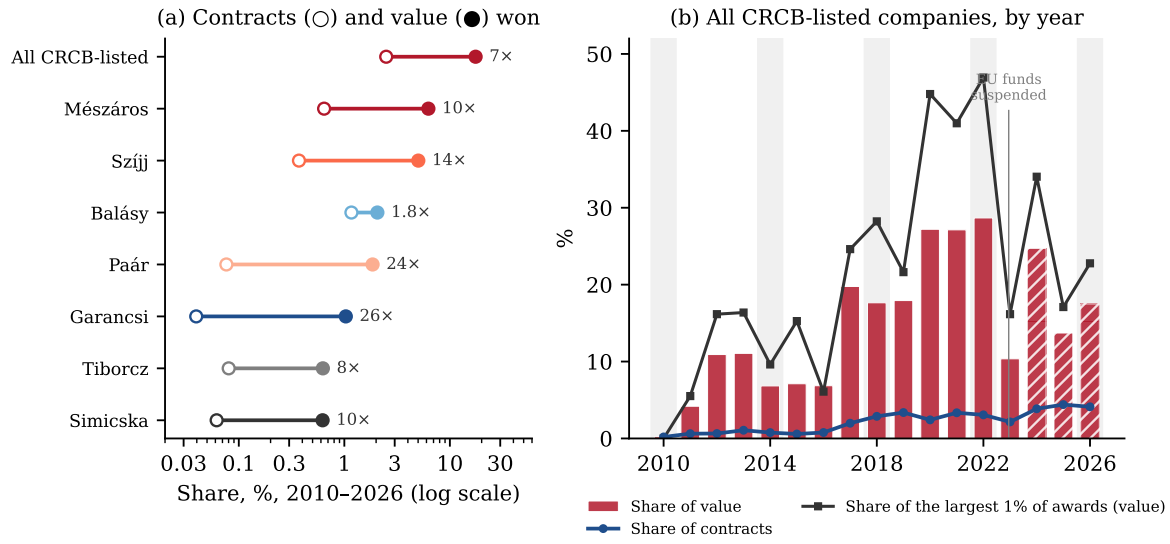


Figure S8: Contracts and value won by CRCB-listed companies above the EU thresholds. Panel (a): share of awards (open) and of value (filled), 2010–2026, log scale; the number is the ratio. Panel (b): by year, shares of value, of contracts, and of the value of the year's largest 1% of awards; shaded: election years; hatched: EKR registry EU-regime contracts 2024–2026 (2026: to 8 May). Consortium awards split equally for both measures. Source: TED, EKR contract registry; author's calculations.

The share fell to 10.4% in 2023, when EU funding for Hungary was restricted, returned to 24.7% in 2024, mainly through Duna Aszfalt's contracts for the Mohács Danube bridge and the M49 expressway, and fell to 13.7% in 2025; in the contracts decided before 9 May 2026 it was 17.5%. TED's eForms notices, which date awards by publication rather than signature, give 25.1, 9.7 and 10.0% for these three years, and 16.8% for 2024–2026 together against 18.9% in the registry. EU funding shaped these swings. In TED, the companies won 46.1% of EU-funded but 19.1% of nationally funded value in 2021, and 40.5 against 22.1% in 2022, whereas after the suspension of EU funds their share of EU-funded registry value fell to 8.5%. The list understates the circles' reach. RM International, a joint subsidiary of two companies that CRCB associates with Lőrinc Mészáros, was the Hungarian member of the consortium awarded the Budapest–Belgrade railway contract in 2019 but is not on CRCB's list (Kínai–Magyar Vasúti Nonprofit Zrt. 2019; Opus Global Nyrt. 2020); counting it raises the 2018–2021 share to 23.9%. Firms owned by other allies of the governments are not counted at all. The shares therefore describe the companies CRCB names, not the full extent of politically connected procurement.

S4.6 Beyond procurement: concessions and state transactions

Procurement is not the only channel through which public money and rights reach companies. Concessions, rights to operate public infrastructure or services in exchange for fees or payments, are awarded under a separate law. Their recorded values estimate the operator's turnover over the concession rather than public purchases, so we exclude them from all the measures above and examine them here. This subsection uses only official records and the parties' own disclosures. TED and the registry record 60 distinct concession awards in the study period (79 records, as

many awards appear in both), mostly municipal district heating, catering, cemetery and bathing services. None went to a company on CRCB's list, and five were awarded by national bodies (Supplementary Table S17).

One of them dwarfs the rest. In May 2022 the National Concession Office awarded the design, renovation, construction, operation and maintenance of about 1,662 km of expressways, with 381 km more as an option, for 35 years to a consortium of seven private equity funds. The award notice records two bids, a price criterion weighted 95 of 100 and a winning fee of net HUF 96.201 million per kilometre a year, which the state pays as an availability fee and an availability-based service fee (Nemzeti Koncessziós Iroda 2022b). The budget for 2022, adopted before the award, had no line for such a fee (Parliament of Hungary 2025b). The final accounts record payments under the new line for the expressway network's availability fee of HUF 13.5 billion in 2022, 176.0 billion in 2023 and 226.7 billion in 2024, HUF 416.2 billion (EUR 1.07 billion) in all (Parliament of Hungary 2025a), and the budget acts appropriated HUF 370 billion for 2025 and 210 billion for 2026 (Parliament of Hungary 2025b). The payments of 2022–2024 alone equal 5% of the contract value above the EU thresholds that the CRCB-listed companies won in sixteen years. Neither the award notices nor CRCB's list identify who owns the funds. The same office awarded MOL, the oil and gas group, the national waste-management concession for 35 years on a single bid (Nemzeti Koncessziós Iroda 2022a).

State transactions outside procurement law also moved large sums between the state and a CRCB-listed company. In 2021 the state agreed with 4iG, which CRCB associates with Lőrinc Mészáros and Gellért Jászai, to merge 4iG's telecommunications companies into the state-owned Antenna Hungária. By April 2022 4iG had contributed assets worth HUF 534 billion in two capital increases and held 76.78% of the company, the state the remaining 23.22% (4iG Nyrt. 2022). In January 2023 Antenna Hungária and Corvinus, a state-owned investment company, bought Vodafone Hungary for HUF 660 billion, taking 51 and 49% (Vodafone Group 2023; 4iG Nyrt. 2023). Supplementary Table S17 lists these and other verified transactions, including the state energy group's purchase of the Mátra power plant for HUF 17.4 billion in 2020 (MVM Magyar Villamos Művek Zrt. 2020). The amounts measure different things (payments, prices, contributed assets) and cannot be added to the procurement totals, and the list is selective. These examples identify additional state–corporate transactions outside procurement accounting. Contributed assets and payments to sellers cannot be interpreted as cash received by the listed actors, so they do not establish a larger total flowing to those actors.

S5 Buyer-level test of decoupling

This section reports the buyer-level test summarised in Section 5.3 of the main paper. It asks whether the Hungarian buyers whose EU-funded single bidding fell most also shifted EU-funded contract value away from the listed companies. If the indicator tracked allocation, larger falls in single bidding should go with falls in the listed share, so that the slope of the change in the listed share on the change in single bidding is positive. A slope near zero would be consistent

with decoupling, but a statistically unresolved slope cannot establish it.

Data and measures. The test uses the Hungarian EU-funded awards of the competition design sample (Section S2), matched at award level to the recipient data. The match is available for TED award notices of 2010–2023; it compares 2010–2014 with 2016–2023 and excludes the transition year 2015. For each buyer and period, single bidding is the notice-weighted share of single-bid awards among the buyer's awards to companies that are not listed. In raw terms, the listed companies' EU-funded awards were single-bid less often than other awards (9.9 against 23.9 per cent), so single bidding measured over all awards would fall mechanically whenever the listed share rose; excluding the listed companies' own awards removes this link, and Table S9 shows that the choice makes little difference. The listed share is the listed companies' share of the buyer's EU-funded contract value, with consortium awards split equally. Buyer names are harmonised across long legal forms, leading acronyms, the 2023 renaming of counties and documented successor names: 203 harmonised buyers combine more than one original name, among them the road and rail investment agency, which appears under three names. This harmonisation is applied only to this test. The main designs retain separate name keys, which can weaken continuity across a buyer's name changes.

Results. Panel A of Table S9 reports the two-period comparison. In the main specification, 35 buyers have at least 5 units of notice weight on awards to non-listed companies in both periods. Their single bidding fell by −15.2 points on average, while the listed companies' share of their EU-funded value rose from 17.6 to 33.6 per cent. The slope is −0.08 with value weights (95% bootstrap interval −0.66 to +0.33) and −0.03 unweighted (−0.23 to +0.16); the rank correlation is −0.10 ($p = 0.58$). Every variant's interval includes zero. The only variant with a large positive value-weighted slope is the comparison with 2021–2023 alone (+1.19, interval −0.63 to +2.23). It rests on 24 buyers, 70 per cent of whose weight belongs to the road and rail investment agency; without the agency the slope is +0.05. The agency illustrates the coexistence of lower single bidding and a higher listed share. Single bidding on its awards to non-listed companies fell from 11.9 per cent in 2010–2014 to 5.7 per cent in 2021–2023, while the listed companies' share of its EU-funded value rose from 23.6 to 74.6 per cent (23.1 and 74.6 per cent over all its EU-funded TED awards). In the main comparison the agency carries 67 per cent of the weight; without it the value-weighted slope is −0.15.

Figure S9(b) splits the buyers at the median change in single bidding. Among the buyers whose single bidding fell more (by −29.3 points on average), the listed share rose from 11.8 to 28.5 per cent; among the others (−0.3 points), from 18.6 to 34.8 per cent. The difference between the two changes is +0.4 points (interval −20.3 to +30.6).

Panel B uses year-to-year variation within buyers. With buyer and year fixed effects, the value-weighted coefficient of the listed share on single bidding is +0.10 (standard error 0.06) and the unweighted coefficient −0.01; among buyer-years with at least three notices to non-listed

Table S9: Buyer-level test: changes in single bidding and in listed companies' share of EU-funded value

A: 2010–2014 to 2016–2023	Buyers	Listed share (%) before → after	Slope: Δlisted share on Δsingle bidding Value-weighted	Unweighted	Spearman ρ
Main specification	35	17.6 → 33.6	−0.08 [−0.66, +0.33]	−0.03 [−0.23, +0.16]	−0.10
Single bidding, all awards	36	17.5 → 33.6	−0.07 [−0.66, +0.31]	−0.05 [−0.25, +0.14]	−0.15
≥3 notices	60	17.2 → 32.9	−0.01 [−0.39, +0.30]	+0.02 [−0.07, +0.11]	−0.02
≥10 notices	20	18.6 → 36.0	+0.21 [−1.39, +0.97]	−0.13 [−0.65, +0.39]	−0.19
After: 2016–2020	28	17.8 → 20.2	−0.07 [−0.21, +0.19]	+0.07 [−0.10, +0.36]	−0.11
After: 2021–2023	24	19.6 → 59.2	+1.19 [−0.63, +2.23]	+0.30 [−0.16, +0.66]	+0.13
Listed share, all TED awards	35	17.0 → 33.5	−0.08 [−0.66, +0.32]	−0.08 [−0.36, +0.15]	−0.10

B: buyer-year panel	Buyer-years	Buyers	Value-weighted	Unweighted
Main specification	1,609	466	+0.10 (0.06)	−0.01 (0.01)
Single bidding, all awards	1,660	477	+0.08 (0.05)	0.00 (0.01)
≥3 notices per buyer-year	303	75	+0.23 (0.09)	+0.06 (0.04)

Notes: Hungarian EU-funded awards in the competition design sample (competitive procedures, no frameworks, bid counts observed), matched at award level to the recipient data; TED award notices 2010–2023, 2015 excluded. Single bidding: share of awards with one bid in percentage points, weighted by 1/awards per notice. Listed share: listed companies' share of the buyer's EU-funded contract value (consortium awards split equally); before → after gives the aggregate share of the buyers in each row. Main specification: single bidding on awards to non-listed companies, at least 5 units of such notice weight per period; the other rows change one element (single bidding over all awards; minimum notices; after-period; listed share over all the buyer's EU-funded TED awards rather than the design sample). Panel A: buyers with at least the stated total notice weight on awards to non-listed companies in both periods; value weights are the buyer's EU-funded value in both periods; 95% buyer-bootstrap intervals in brackets (4,000 replications). Panel B: coefficient of the listed share on single bidding with buyer and year fixed effects, 2010–2023 without 2015, buyer-clustered standard errors in parentheses. Buyer names are harmonised across legal forms, acronyms and documented successor names. Source: TED, CRCB; own calculations.

companies, the value-weighted coefficient is +0.23 (0.09). Years in which a large buyer's other awards were more often single-bid thus coincided with somewhat higher listed shares, so the indicator is not wholly uninformative about allocation at the margin. Multiplying the larger coefficient by the average fall in Panel A gives about 3.5 points, against an observed rise of about 16 points. This compares different samples and weights and is illustrative, not a causal decomposition.

Limits. Few buyers have enough EU-funded notices in both periods, and value weights are dominated by one agency, so the slopes are imprecise. The test covers TED award notices to 2023 only, and the listed share is a descriptive allocation measure, not evidence of improper awards. The estimates permit material positive or negative relationships. They establish neither equivalence to zero nor allocation's causal response to oversight; the aggregate listed shares rose in both halves of the median split.

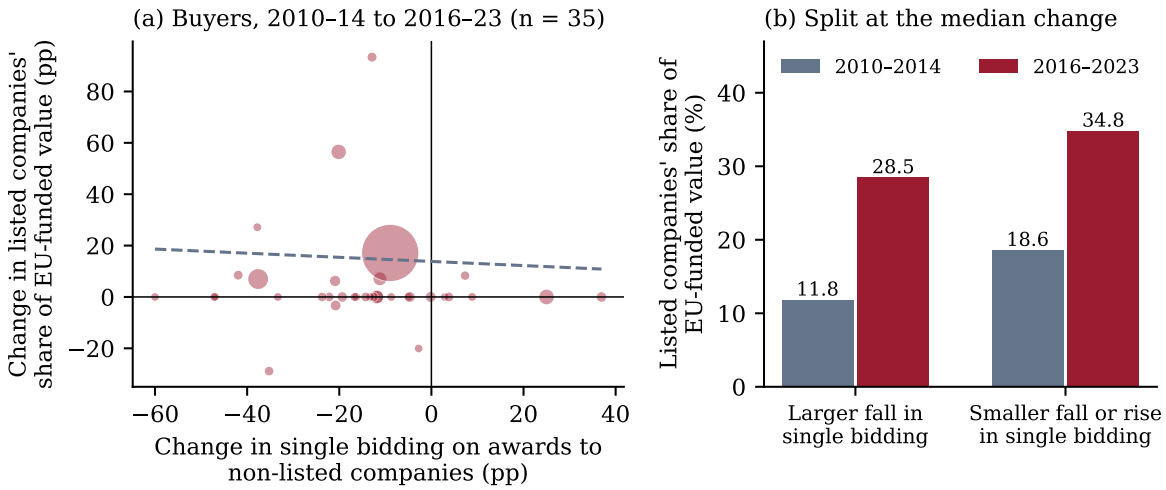


Figure S9: Changes in single bidding and in the listed companies' share of EU-funded value, Hungarian buyers, 2010–2014 to 2016–2023. (a) One circle per buyer with at least 5 units of notice weight on awards to non-listed companies in both periods; circle area is proportional to the buyer's EU-funded value; dashed line: value-weighted fit. (b) Aggregate listed share of the buyers with above-median and with below-median falls in single bidding. Single bidding is measured on awards to non-listed companies. Source: TED, CRCB; own calculations.

S6 From submitted offers to contract execution: an exploratory follow-up

The national results distinguish recorded participation from allocation. This follow-up asks what happens between those two outcomes, and between an award and delivery: which submitted offers remain admissible, what the signed prices buy, who the contracting entities are, and what execution evidence is publicly observable. It is a purposive documentary study, separate from the population estimates. Decisions remain within the earlier Fidesz-era boundary of 8 May 2026; follow-up documents were acquired and reviewed through **7 October 2026**. Later publications describe earlier decisions or their execution. They do not enlarge or refresh the estimation samples. The records identify reproducible questions and also supply contrary evidence; they establish no fraud finding.

S6.1 Selection, units and evidence coverage

The frozen pilot contains **26 award-lot outcomes in 22 procedures from 12 buyers**. Nineteen targets were selected from the earlier recipient screen because every rival submission was reported rejected; seven comparators were selected without that rejection filter. Selection therefore conditions on the outcome under investigation. The study is neither representative nor blinded, and its classifications cannot estimate national rejection prevalence or a politically associated supplier's causal advantage. Published association lists are screening devices, not substitutes for dated ownership of every participant.

Across the original TED award XML and EKR evaluation summaries, the selected lots have 63 submissions (Table S10). A consortium is one submission; a firm bidding for two

lots contributes twice. "Valid" and "rejected" are reported administrative classifications, not independently adjudicated legal conclusions. A tender not fully assessed under the stated evaluation order is a separate category.

Table S10: Reported submission outcomes in the selected pilot

Selection	Lots	Submitted	Valid	Rejected	Unassessed
All-rivals-rejected targets	19	47	19	28	0
Comparators	7	16	11	4	1
Total	26	63	30	32	1

Source: 23 preserved TED award XMLs and EKR summaries covering all selected outcomes. Counts describe this purposive sample, not population rates.

The captured public attachment lists supplied 84 originals: 42 PDFs, seven DOCX and 35 XLSX files. These include templates and specifications, rather than completed losing offers or a complete correction history. All 33 advertised signed-file IDs for the 26 selected contracts were subsequently acquired, yielding 32 distinct binaries: the identical BVK file covers both selected lots. Five optional files from four other contracts complete the captured 30-contract inventory (38 IDs, 37 binaries), without enlarging the pilot. Exhausting advertised files is not completeness of the buyer-held dossier. Detailed review concentrated on thirteen priority advertisements across eight selected contracts; other packages received bounded first passes. (Elektronikus Közbeszerzési Rendszer 2026)

The extension adds dated issuer filings, buyer disclosures, consultation records and output publications. In keeping with the study's open-data design, no information was requested from buyers, authorities or the parties concerned. Source ledgers retain URLs, dates, hashes and physical-page or worksheet locators. Hashes establish captured identity, not truth or signature authenticity. Missing annexes, empty payment arrays and unsuccessful searches are unobserved evidence, not proof of nonexistence, nonpayment or concealment.

S6.2 Multiple submissions can leave one admissible offer

Several nominal price gaps deserve investigation without becoming identified savings. In MNB's Oracle Java procedure EKR000963132024, IMG's HUF 224,988,000 offer was HUF 31,512,000 (12.29%) below 4iG's HUF 256,500,000. The summary, physical pp. 3–5, cites missing subcontractor, sanctions and insurance declarations, but does not disclose the correction sequence. The signed package supplies the winner's price extract and 1,500 subscriptions over three years, not the full bid. A contract-stage form with empty subcontractor blocks and the earlier summary's named capacity provider require chronological reconciliation; the two forms serve different legal purposes, so equivalent defects have not been demonstrated.

In NSÜ procedure EKR002383222024, Porsche's HUF 338,528,232 nominal 36-month offer was HUF 76,134,168 (18.36%) below M1's HUF 414,662,400. Summary pp. 7–10 describe an actual cost workbook, further cost-coverage objections and secrecy problems, with opportunities

to respond. The workbook and exchanges remain absent. The withdrawal of Mercarius from the initial M1 consortium, at unchanged price and score, needs the dated qualification and withdrawal record; it is not itself an established unlawful substitution. Neither nominal gap identifies an admissible equivalent alternative.

Other records sharpen the comparison. Nitrokémia's summary for EKR001591282024, pp. 5–6, admits that the buyer's price-table heading wrongly requested 2023 instead of 2024 prices. The rival also faced separate capacity-provider and expert grounds, preventing attribution of rejection to that error alone. MÁV's final summary for EKR000455202025, pp. 9–18, records multiple rival response opportunities and a request for comparative information from the winner. Police-source records confirm that the referenced entrepreneur and present Varga company have different tax roots; succession, capacity reliance and completed orders remain unverified. The ongoing-framework interpretation is unresolved alongside separate price and secrecy grounds. Buyer summaries support concrete tests, but not a matched comparison showing an equivalent defect tolerated for the winner.

S6.3 OVSZ: a calculable discrepancy with an unobserved formula

The four regional repair contracts in EKR001205622025 provide a useful within-procedure check. M1 suppliers win lots 1–2; DRÁVA-CAR and Varga win lots 3–4 against admissible M1 offers. Signed physical p. 2 prints component discounts and an evaluated average (Table S11). Three averages lie outside the range of their two components under an ordinary nonnegative normalized two-component interpretation. That is a documentary discrepancy, not proof of manipulated scores.

Table S11: OVSZ's printed discount fields (%)

Lot and winning party	OEM	Equivalent aftermarket	Evaluated average
1: M1 Szerviz	6	6	3
2: M1 joint suppliers	6	26	5
3: DRÁVA-CAR	22	22	22
4: Varga	10	15	5.5

Physical p. 2 of EKR contracts 1144993, 1144966, 1144967 and 1144982, respectively; fields agree with the preserved evaluation summaries.

The first evaluation summary, p. 7, explicitly refers to a buyer Excel calculation which was not obtained. Its proportional scoring rule and criterion weights do not reveal the internal discount basket. An exploratory expression $0.4d_{\text{OEM}} + 0.1d_{\text{aftermarket}}$ fits lots 1, 2 and 4 but fails lot 3; its coefficients sum to 0.5 and are not observed tender weights. A broader basket, differing version or stale field remains possible. Small separate score-reconstruction differences leave the observed rankings unchanged.

Lot 1's signing/term certificate requirement (clause 6.14, p. 7) contrasts with the attached ISO 9001 copy's 7 December 2025 expiry (pp. 29–30), before the 2026 signatures. The supplier's currently linked copy repeats that expiry (MARTON Szakértő Iroda Kft. 2024);

renewal or an accepted equivalent elsewhere remains possible. Lot 4's performance guarantee (pp. 27–28) prints an earlier expiry than the registry term and a different underlying-contract date; no demonstrated security gap follows without extensions or corrections. These tests include comparator winners, rather than only M1. Two explicitly referenced consultations, EKR000720052024 and EKR000465142025, report zero formal participants/comments on 30 April 2024 and 31 March 2025. That measures formal consultation participation, not all market research or subsequent competition.

S6.4 BVK: distinguish a priced basket from cars billed

BVK's combined agreement 548-24/2025 in EKR001304202024 (contracts 956028/956030) describes six base cars, one additional car and an increased-mileage option for one base car (physical pp. 2–3, 24). Its p. 18 table instead counts eight by adding a full higher-mileage car alongside three ordinary lot-2 cars. The HUF 2,569,802 monthly total reproduces the registered commitment. If the higher-mileage rate replaces an ordinary rate and both options are exercised, the illustrative 48-month lot-2 amount is HUF 60,717,120 rather than HUF 75,656,400: a conditional HUF 14,939,280 difference, not measured overpayment.

Four buyer publications repeat the monthly amount and/or its HUF 30,837,624 annualization (Budapest Főváros Vagyonkezelő Központ Zrt. 2026): March 2025 workbook row 2438; December 2025 PDF p. 13; August 2026 workbook row 2743; separate contract-register row 136. They also print 4 March 2027 alongside a 48-month term. Repeated publications may share one database. They establish neither eight deliveries nor actual billing. The fee annex, evaluation basket, handover dates and invoices remain missing. The lower rejected MOL offer also specified mHEV where the archived pre-bid sheet required PHEV; its nominal gap cannot be treated as an established equivalent alternative. The signed upper-management-car row itself lists both mHEV and PHEV models; those labels must be matched to the missing winning technical specification before independently establishing the winner's compliance. The PHEV/80 kW requirement concerns that combi, not every vehicle in the price table. Justification of the requirement itself is a separate question.

S6.5 MNB: performance shares and dated corporate links

Riverbed/IXIA procedure EKR001485682025 (contract 1118207) supplies a HUF 249,248,536 package, including optional days. The winning offer extract, p. 5, gives NTT an 80% prospective share, whereas the contract-stage declaration, p. 1, gives 15% and HUF 38,219,706 plus VAT. Both are plans. MNB's public forms distinguish performance share from contractual consideration, and request actual amounts/dates paid separately (Magyar Nemzeti Bank 2025). Current blank forms do not authenticate the historical versions used. Consequently neither share is a proved cash allocation, and the simpler Crayon 10%/HUF 150,000 comparison with its HUF 10.85 million contract is not an established financial inconsistency. Riverbed's changed arrangement, scope or version still requires explanation; the full bid and named NTT pre-contract are absent from the inspected package.

Ownership is a distinct link. MNB's storage contract 1049609 (EKR002373452024) names 4iG Informatikai, tax root 32692231, jointly with Officium; the Oracle Java contractor is the distinct 4iG Nyrt., 12011069. Issuer filings show the IT subsidiary wholly owned by the listed parent at 30 June and 31 December 2025, following the completed spin-off, and attribute a 52.76% parent block to Jászai-controlled vehicles (4iG Nyrt. 2025, 2026). This supports dated group membership, not the supplier declaration's conversion into 100% personal economic ownership. Fund-unit holders and personal receipts are not reconstructed; snapshots are not daily ownership histories.

Similarly, GVH's May 2023 certificate concerns the notified acquisition of sole control of M1 Autókereskedő by the MKB fund; it does not establish implementation or later ownership (Gazdasági Versenyhivatal 2023). A public mirrored 5 May 2025 corporate minute prints Talentis 38.53%/MBH fund 61.47%, but has blank signature lines and is not registry-authenticated (Mészáros M1 Autókereskedő Kft. 2025). These facts cannot be transferred to the distinct OVSZ Szerviz or Járműparkkezelő entities. Their declarations' literal 100/100 cells have no printed units; they are not independently verified personal economic fractions.

S6.6 Semmelweis: amended scope alongside positive output evidence

The Anatomy contract in EKR000827672024 (current record 1199243) joins disputed evaluation to later execution. DENCO's concrete-reference quantity remains unresolved: the summary, pp. 6–7, describes issuer consultation, conflicting quantities and a late second response, not a proven false reference. The first amendment, signed 3 July 2025, supplies a priced roofwork H-package of HUF 392,797,026 (pp. 7–38), raising the reserve-inclusive total from HUF 2,618,669,997 to HUF 3,011,467,023. The increase is 14.999867% of that original reserve-inclusive commitment; this denominator does not establish a legal threshold or threshold gaming. Stated structural/insulation reasons and the missing original budget must be assessed together.

The second amendment, dated 13 April 2026, supplies ten substitution groups at unchanged stated fee and deadline. Lift papers, pp. 4–10, retain both buyer reservations and acceptance with designer/inspector support. The heating-centre relocation, pp. 53–54, gives utilities/scheduling reasons and claims offsetting costs. Brand changes and unchanged fees do not establish inferior output or increased margin. Engineering approval is evidence of the stated decision, not independent price-equivalence or installation proof.

The university's 14 July 2026 publication reports added teaching space, an upper floor, replaced windows and energy-related improvements (Semmelweis University 2026). Its programme page gives planned completion on 30 June 2026, consistent with the amended cap. These are positive buyer-reported outputs, constraining a presumption of non-delivery. They do not identify installed models, authenticate acceptance or demonstrate energy savings. The broader HUF 5,557,785,462 programme grant is not contractor payment; the registry's HUF 1,719,341,812 payment row is neither a complete expenditure total nor independently corroborated receipt.

S6.7 Implications and remaining identification limits

Benign and contrary evidence matters throughout. HungaroControl's 8.98% increase contracts for four additional cars; options and per-car terms must precede a unit-price comparison. Nitrokémia expressly permits indexation, and its earlier commencement field offers a concrete alternative explanation of publication timing. M1 loses admissible OVSZ comparisons, 4iG loses an admissible Oracle comparison, and former consortium partners sometimes bid separately. These observations reject a mechanically deterministic allocation story without ruling out selective favoritism elsewhere.

The follow-up advances the paper from bid counts to named evaluation and execution tests. It supports neither population misconduct prevalence nor a fraud verdict. The decisive missing links are equivalent original-offer and correction records, the actual pricing workbooks, dated contractual arrangements, and accepted outputs matched to invoices/payments. Continued work uses openly published records without contact. Concentrated commitments, declared control, performance shares, company profits and personal receipts remain distinct: none supplies the missing transaction or proves intent.

S7 Data construction

TED CSV, 2010–2023. Contract award notices; one row per contract award: exact repeats of the selected fields are kept once, and every copy of an award identifier with conflicting content is quarantined (296 EU27 awards, whose copies differ in the award criterion or the EU-funding flag); cancelled notices, awards with a non-award reason and EU institutions (CAE types 5 and 5A) removed. The EU-funding indicator is `B_EU_FUNDS`; the bid count is `NUMBER_OFFERS`, which must be a positive integer (zero, negative and fractional values are treated as missing); values are `AWARD_VALUE_EURO` and `AWARD_EST_VALUE_EURO`.

eForms, October 2023 – 8 May 2026. Contract award notices published before 9 May 2026 (notice type `can-standard`, subtypes 29–32) retrieved from the TED Search API v3, one file per country and month. Business terms used: BT-105 (procedure), BT-23 (contract nature), BT-11 and BT-10/BT-610 (buyer legal type and activity), BT-137 and BT-13713 (lot and lot-result identifiers), BT-142 (winner selected), BT-60 (EU funds), BT-765/BT-766 (framework agreement, dynamic purchasing system), BT-262 (CPV), BT-759/BT-760 (received submissions by type), BT-27 (estimated value), BT-720 and BT-161 (tender and notice result values). Received-submission statistics are split into one block per lot result; the bid count is the number of tenders or, if only that is reported, the number of electronically submitted tenders, and it must be a positive integer. A notice is excluded when its winner-status array does not hold exactly one entry per lot result (76 notices); exact repeats of a notice are kept once, and conflicting copies would be quarantined (none occur). Country-years in which bid counts are observed for less than 70% of competitive awards with known EU funding and CPV division are excluded from the contract-level designs; this removes Estonia in 2013, Croatia in 2026, Lithuania, Poland

and Slovenia in 2024, and Romania in 2024 and 2025. Missing country-year gaps are not imputed in the balanced country-level estimators, which also exclude Croatia and Estonia from the 2010–2023 panel. Notices published during the transition in the old format are dropped from the eForms files (they are in the 2023 CSV file).

Validation. The panel has 5,301,455 awards with unique identifiers, and every bid count it uses is a positive integer. Each builder writes a validation record of exact duplicates, quarantined conflicts, malformed counts and excluded notices, with their source locations. Checked against buyers' reported national identifiers (standard forms, 2017–2023), 99% of identified Bulgarian awards carry the most frequent identifier of their name key; lower agreement in Hungary reflects identifier formats that change across reporting systems, not merged buyer names.

Competitive procedures. TED CSV: open, restricted, negotiated with a call for competition, competitive dialogue and innovation partnership, excluding framework agreements, dynamic purchasing systems and procedures outside the directives. eForms: the corresponding codes plus "other multiple-stage" procedures (BT-105 `oth-mult`), which in Hungary replace the national two-stage procedures that the old forms recorded as restricted (2,384 restricted awards in 2021–2023 in the CSV data against 18 in eForms, and 5,776 `oth-mult` awards in eForms).

Programme spending. The Commission's Cohesion Open Data platform supplies modelled annual expenditure by programming period. We use these series to date the 2014–2020 programme exposure and draw the spending bars in the main event-study figure (European Commission 2026c).

Samples. The Hungarian designs use the stacked CEE panel of TED CSV and eForms awards, 2010–2026, restricted to competitive awards with an observed bid count and EU-funding indicator in country-years with adequate bid-count reporting.

Mechanism variables. The number of bids is `NUMBER_OFFERS` (TED CSV) or the tenders statistic of BT-759 (eForms); for the log specification it is restricted to awards with at least two bids and capped at 100. Non-award outcomes are `INFO_ON_NON_AWARD` = `PROCUREMENT_UNSUCCESSFUL` (TED CSV, reported from 2016) and BT-142 = `clos-nw` (eForms).

Supplier identifiers and calls. The legacy winner construction combined `WIN_NATIONALID` and normalised `WIN_NAME`, using only the first consortium member. It does not bridge the introduction of platform identifiers in Hungary and is excluded from the mechanism estimates. The award criterion is `CRIT_CODE` (L = lowest price). Calls for competition come from the TED CSV files of calls, 2010–2023; for each call (`ID_NOTICE_CN`) the identifiers of later award notices are taken from `FUTURE_CAN_ID` across its lots. A call counts as awarded when any

linked award notice reports an award without a non-award reason. Days to award run from the call's `DT_DISPATCH` to the earliest `DT_AWARD` of the linked awards (or the award notice's dispatch date); values below zero or above 1,500 are discarded. Calls published in 2023 are excluded because their awards appear in eForms. Hungarian buyers kept publishing old-format notices until October 2023, so few awards to calls of 2022 are lost at the switch; the 2022 results hold for calls of the first half of the year, whose awards had more than a year to appear.

EU-financed expenditure. Cohesion Open Data, "Historic EU payments – regionalised and modelled", summed over funds (ERDF, Cohesion Fund, ESF, YEI, EAFRD, EMFF, FEAD) and NUTS2 regions; the modelled annual expenditure distributes payments over the years in which expenditure took place and is available to 2022.

Buyer names. We transliterate names to Latin script with the Unidecode library, version 1.3.8, then upper-case them, strip punctuation and common legal-form tokens and combine the result with the country code. Transliteration matters: deleting characters without an ASCII decomposition instead would collapse 97.2% of Bulgarian awards into one empty key and split Polish and Croatian spellings of the same buyer (ł, đ). An earlier build of this panel did so; correcting it moved the principal period means from −12.83 and −21.46 pp to −12.66 and −20.98 pp, and reduced the design sample's Polish buyer keys from 15,531 to 15,306 as spelling variants merged.

S8 Additional procurement results

Table S12: Single-bid shares in Hungary: TED measures and official statistics (%)

	TED, competitive procedures		Official	Source of official figure
	Awards	Notice-wtd.		
All procedures, 2021	41.0	38.8	40	European Commission (2026)
EU-funded, 2023	8.3	9.7	5.5	Transparency Int. Hungary (2025)
Nationally funded, 2023	42.5	36.9	29	European Commission (2025)
Nationally funded, 2024	38.5	33.1	22.3	European Commission (2025)

Notes: TED shares cover our competitive-procedure sample. The Commission's national-funded commitment series concerns procedures under EU rules, rather than all lower-value national-rule procedures. Differences in selection, definitions, weighting and data vintage have not been fully reconciled; the table is a comparison, not a validation of identical denominators.

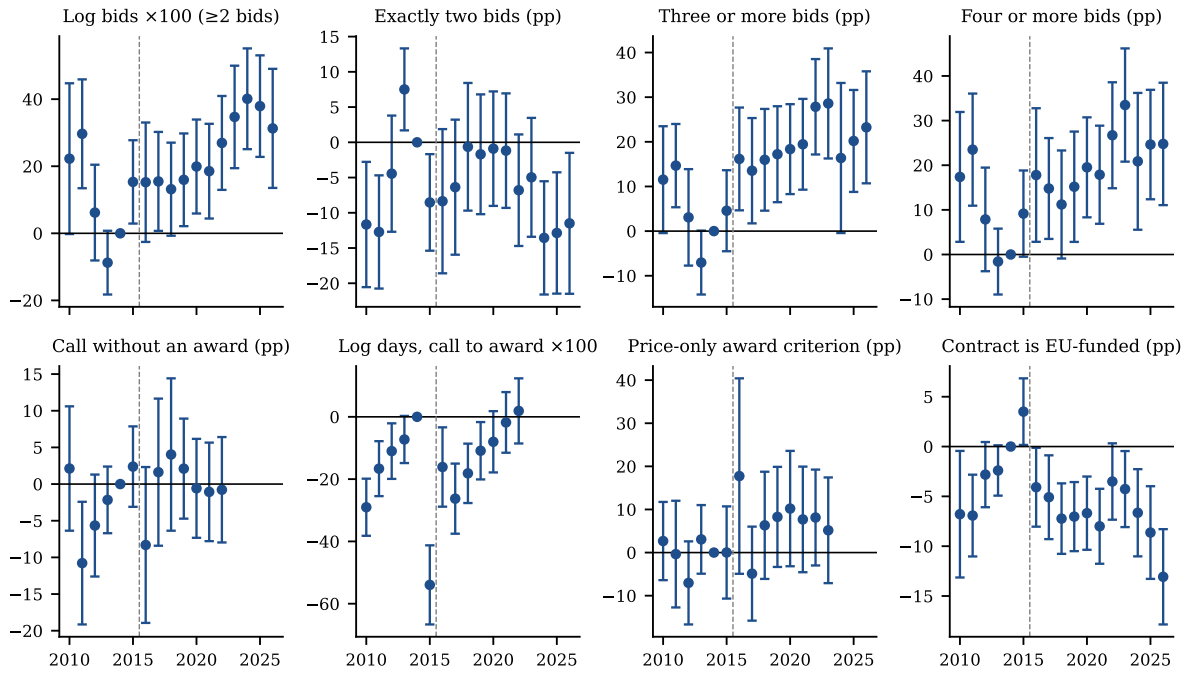


Figure S10: Mechanism outcomes: Hungary × EU-funded × year, relative to 2014, with 95% confidence intervals clustered by buyer. Price-only criteria: TED CSV awards, 2010–2023. Calls: calls for competition published in 2010–2022, one observation per call. EU-funded: probability that a contract is EU-funded, Hungary vs other CEE, within buyers.

S9 Exploratory supplier-group comparisons

We separately analyse the public CRCB national-register release of 16 March 2026 (Corruption Research Center Budapest 2026b), using its selected-supplier flag and retaining records with the source's undocumented analysis flag, known funding, named winners and one to 31 valid bids. It covers a different market from our TED sample. The supplier flag is a selected list rather than a complete, dated political-connection classification; other suppliers are not verified unconnected. Table S13 compares single-bid shares in 2021–2023. Within each funding source, the adjusted comparison retains exact buyer-name–year cells containing both supplier groups and weights the cell difference by $n_0 n_1/(n_0+n_1)$. This is a descriptive fixed-effects comparison, without causal interpretation or inferred sampling precision.

The national-funded gap falls from 16.9 pp unadjusted to 1.5 pp within common buyers and years. Adding award-size bins gives 2.2 pp; discarding identical rows as a sensitivity gives 1.6 and 2.3 pp. Dropping the analysis-flag restriction changes the four table gaps by less than 0.02 pp. These checks show why a raw supplier-group gap cannot establish differential treatment on comparable tenders. They do not dismiss political allocation: sorting suppliers across buyers can itself be a channel of favouritism, and overlap restrictions omit buyers serving only one group. Missing sector and procedure controls, incomplete ownership histories, unverified entity labels and the absence of losing bidders further limit the comparison. Exact duplicate rows may represent separate lots, so deduplication is not treated as the preferred sample. Source files,

Table S13: Single bidding by selected supplier group, national-register data, 2021–2023

Funding	Comparison	Selected (%)	Other (%)	Gap (pp)	N_s	N_o
National	Unadjusted	56.6	39.7	16.9	966	37,338
National	Buyer–year	48.1	46.6	1.5	905	5,597
EU	Unadjusted	4.2	12.3	−8.1	358	13,872
EU	Buyer–year	3.1	7.4	−4.3	317	2,481

Notes: The gap is selected minus other suppliers. Buyer–year shares use common-cell overlap weights, not each group's own contract distribution. Counts are retained source records, which may include multiple lots per notice. Funding and supplier flags are taken from the CRCB release; no ownership classification is inferred. Source: CRCB public release, 16 March 2026; author's calculations. These are not the TED estimates.

hashes and the reproduction script accompany the research note.

S10 The contract registry and recipient groups

Retrieval. The EKR contract registry list (143,106 records) was downloaded in pages of 5,000 and each record's detail from the public interface used by the EKR website; procedure records (CPV, contract type, buyer type and notice identifiers) come from the public procedure store. Download scripts, raw JSON, hashes and a validation record are in the research audit directory. Two contract records returned server errors on repeated requests. Signing dates with impossible years were replaced by registration dates.

Value frame. Contracts preceded by a procurement procedure are included; in-house awards and the few below-threshold records are not. Contracts in procedures that conclude a framework agreement, and are not themselves call-offs, are framework ceilings and are excluded. Call-offs are classified by EKR's procedure type as reopened competition, written consultation or direct purchase. Values are net values at signature (gross values divided by 1.27 where only these are recorded), converted at ECB annual average rates of the signing year (January–September 2026 for 2026). Where the registered and current values differ more than tenfold the current value is used, and single-award procedures whose registry value exceeds the TED award value more than tenfold take the TED value. All contracts above HUF 100 billion were reviewed individually; three implausible values (a HUF 5.5 trillion bus purchase, a HUF 180 billion university IT call-off by a supplier whose annual revenue was about HUF 15 billion, and a HUF 84.5 billion one-year supply of bus spare parts) are excluded, one euro amount is read as forints and one lease takes its amended value. Records with the same procedure, lot, buyer, contractor set, value at signature, currency and signing date are one contract registered more than once; the latest-registered record is kept. A call-off whose value equals its framework's ceiling, in a framework with other call-offs, would make the call-offs exceed the ceiling; its value is treated as unknown (this removes, among others, a HUF 525 billion central gas call-off by a single agency).

Identity and groups. Hungarian tax numbers have eleven digits: an eight-digit root identifying the taxpayer, a VAT code and a two-digit tax-office code. VAT code 4 marks a member of a VAT group, whose community VAT number is the group identifier (HU17. . .). The identifier is recorded in usable form for 34 of the 179 contracting roots with VAT code 4, so the VAT groups recorded in the registry merge few recipients. For the groups of Duna Aszfalt, Strabag, MOL and MBH Bank, members and joining dates come from the tax authority's public register (queried on 1 October 2026), and a member is merged only for contracts signed after it joined. The register lists current members only, so firms that left these groups earlier are not merged. Tenderbajnok snapshots list owners of procurement-dependent firms for 2021, 2022 and 2023. A firm's principal owner is its listed owner who is one of CRCB's named actors if the firm is on CRCB's list, and otherwise the listed owner with the largest procurement portfolio in that snapshot. Each contract uses the snapshot nearest to its signing year in which the firm is listed.

Owner groups merge VAT-group units with the same principal owner within a snapshot; for pooled periods, snapshot groups are merged when they contain the same firm with the same principal owner, so that a joint venture cannot link two owners' groups. Public recipients are roots that also act as contracting authorities in EKR. CRCB's Annex A3 gives current tax numbers; the 8 predecessor and same-name entities added to it (earlier legal forms of Duna Aszfalt and of Mészáros és Mészáros, Duna Aszfalt's project companies, a 4iG and a Visual Europe subsidiary, and a joint company of ÉPKAR and West Hungária Bau) are listed with the evidence for each in the replication files; they share the listed company's name and seat, and CRCB's own contract data flag their awards. CRCB-listed entities that Tenderbajnok does not cover join the group of their listed company or, for listed companies, the largest group whose principal owner is the CRCB-named actor in force in the contract year.

Links to bid counts. EKR records TED publication numbers either as "number-year" or in Official Journal form ("year/S issue-number"); both are converted to the identifiers of our TED panel. CRCB's national-register rows carry the national gazette notice number in their source address, which EKR records for each notice; bid counts are attached where the normalised winner name matches a contracting party of the same procedure.

Timing. Registration lags mean that recent decisions are incompletely registered. Comparisons around 9 May 2026 therefore count, for each earlier year, only contracts first registered by 30 September of that year, the registration age of the 2026 observations. The registry's top-level registration date is that of the latest record, which closure or amendments replace for half of all contracts; the date of first registration is taken from the registration block.

CRCB affiliation periods are implemented at calendar-year resolution: a month-specific start or end includes the stated boundary year, and an undated entry is applied throughout the study window. Open-ended periods are extended through the study cutoff. This attribution does not establish exact historical ownership or relationship dates. Annex A3 repeats Elios's tax number, 14869497-2-41, for EUPRO. We retain the published company-name classification and record this source defect rather than merging the two companies. Neither occurs in the EKR or eForms recipient samples; earlier TED awards are identified separately by name. The defect therefore does not change the reported shares.

Verification. Table S14 lists the checks. An independent re-implementation, written from the stated rules rather than from the processing code, reproduces the 142,917 records, their channels, years and values. A live re-download of 600 records matched the stored copies on every compared field. The checks found the duplicate registrations, the ceilings entered as call-off values, the predecessor entities and the overwritten registration dates described above, and each is corrected in the reported results. Among the alternative accounting choices (CRCB's tax numbers only, lead-only allocation, splitting a ceiling among its call-offs, the TED value

where the registry value is three to ten times larger, values after amendment, dropping corrected values, decision instead of signing year, and the TED funding flag), the 2021–2023 gap between EU-funded and nationally funded shares persists; the 2018–2020 comparison does not, ranging from 11.3 to 33.1% for EU-funded and 22.1 to 26.0% for national value, and is not interpreted. CRCB reports that its top actors' companies won 25% of contract value in the first half of 2026 (Corruption Research Center Budapest 2026c); registry contracts decided between January and 8 May 2026 give 16.2%. The difference comes mainly from two framework agreements for servers and storage awarded by the Digital Government Agency to 4iG Informatikai and Visual Europe, HUF 195 billion each, which CRCB counts and we treat as ceilings. Adding the large TED awards that have no registry counterpart raises the CRCB-listed share in 2021 from 19.6 to 25.3% and in 2018 from 6.5 to 18.8%.

Long-run data. TED award values before eForms are the values reported in the CSV exports. The award field can fall back to the lowest bid when final value is absent (codebook, physical p. 21), so not every amount is an independently verified winning commitment. Large values were separately reviewed as described next. All 1,558 awards of EUR 10 million or more outside framework agreements, which carry 64% of the exported value, were compared with the amounts in their notice texts: 10 forint amounts entered in the euro field are converted, 7 implausible values are excluded after review (each decision is documented in the replication files), and values of EUR 2.5 billion or more are treated as entry errors (the largest genuine award, the Budapest–Belgrade railway, is EUR 1.86 billion). The 13,174 eForms award notices of October 2023 to September 2026 were parsed from their XML: each winning tender is linked through its tendering party to the winning organisations. Every winner is identified by a Hungarian tax number in awards carrying 83% of award value; winners identified only by an internal EKR code or a foreign identifier are matched by name. eForms notices already included in the 2023 CSV export are taken from the export; the others complete 2023 in the headline series and, for 2024–2026, form the comparison series for the registry. The eligibility cutoff uses the award date, then signature date and finally publication/dispatch date where earlier fields are missing; records before 29 May 2010 or from 9 May 2026 are excluded. Annual allocation, affiliation and currency conversion use the CSV annual year for standard forms and publication year for eForms; registry annual allocation uses signature year. The cutoff date and the year plotted are therefore distinct conventions. Concession award notices (standard forms 23 and 25; eForms subtype 32) are excluded and discussed in Section S4.6. Buyers do not always flag framework agreements with several suppliers: an identical value awarded to two or more different winners of one notice in the CSV exports, and two or more winning tenders in one lot in eForms, are treated as framework ceilings. Some eForms notices record a consortium's single tender once for each member, each with the full value; these are counted once. Of eForms award value, 82% belongs to procedures found in the registry, and for these procedures the TED and registry values agree within 10% for 98% of the value. Name patterns for each listed company are applied to

the normalised winner text, and consortium members are counted from the legal-form words of that text. The comparison with tax numbers led to one correction: ÉPKAR, which notices often name in full as Építő- és Épületkarbantartó Zrt., is now matched under both names. In CRCB's data, the national-gazette notice number links awards from 2018 to EKR procedures, which shows that 34% of their value consists of framework ceilings; a rule that flags values repeated for several winners of the same notice catches only 8% of that value, so CRCB's series is shown for comparison only.

Table S14: Verification of the registry analysis

Check	What was tested	Result	Consequence
Code	Independent re-implementation from the raw downloads (separate code)	Same 142,917 records, channels, years and values (the 11 intended TED corrections differ)	None
Storage	Live re-download of 600 records (300 largest, 300 random)	600 identical on all compared fields	None
Duplicates	Same contract registered more than once (mostly migrated pre-2019 records)	4,019 records, EUR 1.6 bn	Removed
Ceilings	Framework ceiling entered as the value of a call-off in a framework with other call-offs	50 call-offs, EUR 2.6 bn registered	Value set to unknown
Affiliation	Predecessor and same-name entities of CRCB-listed companies (new tax numbers after conversion)	8 entities; CRCB's own contract data flag them	Added, dated as CRCB
Dates	Registry date of the latest record replaces first registration (50% of records)	Registration windows use the first-registration date	Corrected
Totals	Integrity Authority market totals, 2020–2025, excluding frameworks	Ratio 0.82–1.05 (value), 0.90–1.11 (contracts)	None
EU flag	Registry EU-funding flag against the TED notice flag	Agree for 99.5% of linked contracts	None
Coverage	TED awards of EUR 20m or more, 2018–2023, without a registry counterpart	68 awards, EUR 7.5 bn (3.7 bn in 2019)	Sensitivity; TED long run
Accounting	8 alternative accounting choices (Appendix text)	2021–2023: EU-funded 25.0–37.1%, national 15.9–21.4%	2018–2020 claim withdrawn
Regressions	8 specifications of the single-bid comparison	Affiliated: −5.4 to 4.9 pp, largest $\lvert t \rvert$ 1.9	Wording
VAT groups	Membership of the four largest VAT groups in the tax authority's register	Duna Aszfalt's intra-group subcontracts confirmed; members dated	Merged from joining dates
Scope	Concession contracts; contracts decided under the new government (from 9 May 2026)	Concession values estimate operators' turnover, not purchases	Both outside the value frame

Notes: Scripts and outputs in the replication files (audit/money_flows_20260930/verification). Money values are net values at signature. "Coverage" compares Hungarian TED contract awards with the registry by notice link or by value and contractor name; the largest awards without a registry counterpart are the Budapest–Belgrade railway (2019) and V-Híd's Ferencváros–Kelenföld railway contract (2021).

Table S15: Contracts and value won by CRCB-listed companies above the EU thresholds, by year, 2010–2026

	All CRCB-listed companies						Share of value by actor family (%)						
Year	Contr.	Value	Size	Top 1%	Top 10	EUR bn	Mész.	Szíjj	Balásy	Paár	Gar.	Tib.	Sim.
2010	0.2	0.2	1.2	0.0	0	0.00	0.0	0.0	0.0	0.1	0.0	0.0	0.0
2011	0.6	4.2	6.7	5.5	0	0.14	0.0	1.6	0.0	0.0	0.3	0.2	2.2
2012	0.6	10.9	17.0	16.2	4	0.65	4.6	5.1	0.0	0.1	0.0	0.1	1.0
2013	1.1	11.1	10.4	16.4	4	0.76	0.0	2.2	0.0	0.7	0.9	0.1	7.1
2014	0.8	6.8	9.0	9.6	2	0.35	0.6	3.6	0.0	0.3	0.4	0.1	1.8
2015	0.6	7.1	12.3	15.3	3	0.27	1.1	1.7	0.0	0.4	3.7	0.0	0.1
2016	0.8	6.9	8.9	6.1	1	0.35	0.3	4.1	0.0	1.0	0.8	0.3	0.1
2017	2.0	19.8	10.0	24.6	5	1.94	5.6	8.9	0.7	2.1	1.4	0.6	0.0
2018	2.9	17.6	6.1	28.2	6	1.15	5.6	5.9	2.3	2.0	1.7	0.0	0.0
2019	3.4	17.9	5.3	21.6	3	1.93	5.7	4.2	1.9	2.0	3.1	1.0	0.0
2020	2.4	27.2	11.3	44.8	7	2.13	12.0	9.1	2.6	3.3	0.0	0.2	0.0
2021	3.3	27.1	8.1	41.0	6	2.83	16.7	1.9	2.6	2.9	1.7	1.3	0.0
2022	3.1	28.7	9.3	46.9	6	3.26	13.6	7.6	1.5	4.2	0.2	1.6	0.0
2023	2.2	10.4	4.8	16.2	2	0.65	4.1	0.5	2.5	0.2	1.9	1.2	0.0
2024*	3.9	24.7	6.4	34.0	3	2.07	4.0	14.4	5.6	0.2	0.0	0.6	0.0
2025*	4.4	13.7	3.1	17.1	3	1.19	3.4	0.9	5.5	3.5	0.0	0.4	0.0
2026*	4.1	17.5	4.2	22.8	4	0.47	6.9	0.0	7.5	2.7	0.0	0.3	0.0
2010–2013	0.7	8.6	12.4	12.5		1.55	1.5	2.8	0.0	0.3	0.4	0.1	3.4
2014–2017	1.0	12.2	11.7	16.8		2.91	2.7	5.6	0.3	1.2	1.4	0.3	0.4
2018–2021	3.0	22.6	7.5	33.5		8.05	10.3	4.9	2.3	2.5	1.8	0.7	0.0
2022–2025	3.4	20.6	6.1	30.3		7.18	7.0	6.3	3.6	2.3	0.4	1.0	0.0
2010–2026	2.5	17.5	7.0	25.4		20.16	6.3	5.0	2.1	1.9	1.0	0.6	0.6

Notes: Awards of Hungarian buyers above the EU thresholds with a reported value in TED award notices; 2010: from 29 May; *: EKR registry EU-regime contracts (2026: decided before 9 May). Contr.: share of awards won, a consortium award counted in proportion to its members; Value: share of contract value, split in the same way; Size: value share divided by contract share, i.e. the companies' average award relative to the average award; Top 1%: share of the value of the year's largest 1% of awards; Top 10: number of the year's ten largest awards with a CRCB-listed company among the winners. Large TED values were checked against the notices (Supplementary Section S10). Elections: April 2010, 2014, 2018, 2022 and 2026.

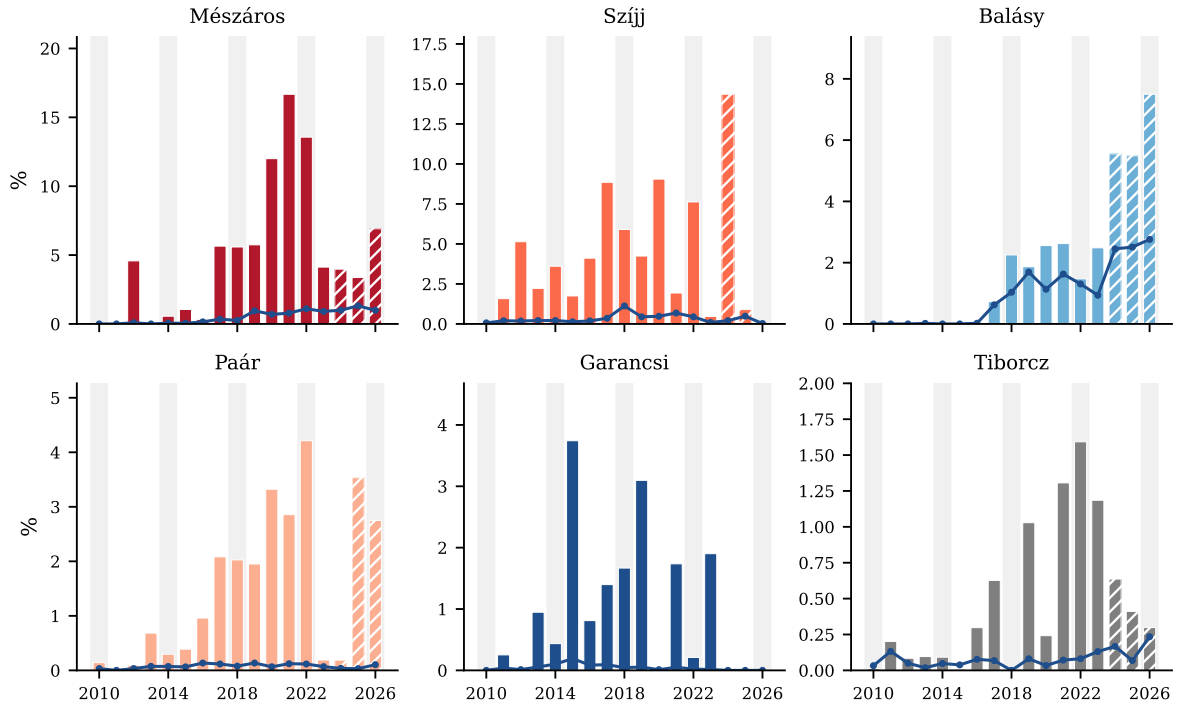


Figure S11: Share of value (bars) and share of contracts (line) won above the EU thresholds by each actor family, 2010–2026 (%). Shaded: election years. Hatched: EKR registry EU-regime contracts (2024–2026; 2026: to 8 May); 2010: from 29 May. Consortium awards split equally among members for both shares. Source: TED, EKR contract registry; author's calculations.

Table S16: Buyers of the contracts won by CRCB-listed companies above the EU thresholds, 2010–2026

	2010–2026			Listed share of value (%)				
Buyer	All EUR bn	Listed EUR bn	Listed %	2010–13	2014–17	2018–21	2022–26	Main family
NIF National Infrastructure Developer	18.7	6.2	33	21	23	43	48	Szíjj
National Communications Office	2.9	2.4	80	–	76	78	81	Balásy
BMSK (state sports investment company)	3.1	2.1	68	0	0	78	58	Mészáros
Ministries of development, innovation and construction	2.0	1.2	62	0	0	1	69	Szíjj
Cities with county rights, Budapest and its districts	6.7	1.1	17	3	6	24	20	Mészáros
National Development Programme Office (NFP)	2.5	0.9	36	–	20	29	56	Mészáros
Magyar Közút (national roads)	3.2	0.5	14	1	7	14	21	Szíjj
Water management directorates	2.0	0.4	21	6	22	19	36	Mészáros
MÁV Hungarian State Railways	6.3	0.4	6	5	3	12	4	Mészáros
National Sports Centres	0.9	0.4	44	22	48	38	6	Paár
MVM group	5.4	0.3	6	4	0	3	8	Paár
Közép-Duna Vidéke Hulladékgazdálkodási Önkormányzati Társulás	0.5	0.3	50	50	–	–	0	Mészáros
Twelve buyers above		16.1						
All buyers	115.0	20.2	18					

Notes: Headline sample of Table S8: contracts of Hungarian buyers above the EU thresholds, 29 May 2010 – 8 May 2026 (TED award notices to 2023, EKR registry EU-regime contracts from 2024), framework agreements and concessions excluded. Buyers whose names vary across notices are grouped by name patterns (replication files); ministries: the ministries responsible for national development, innovation and technology, and construction and transport. Listed: value won by CRCB-listed companies, consortium awards split equally. Main family: the actor family with the largest listed value from that buyer. –: no awards in the period.

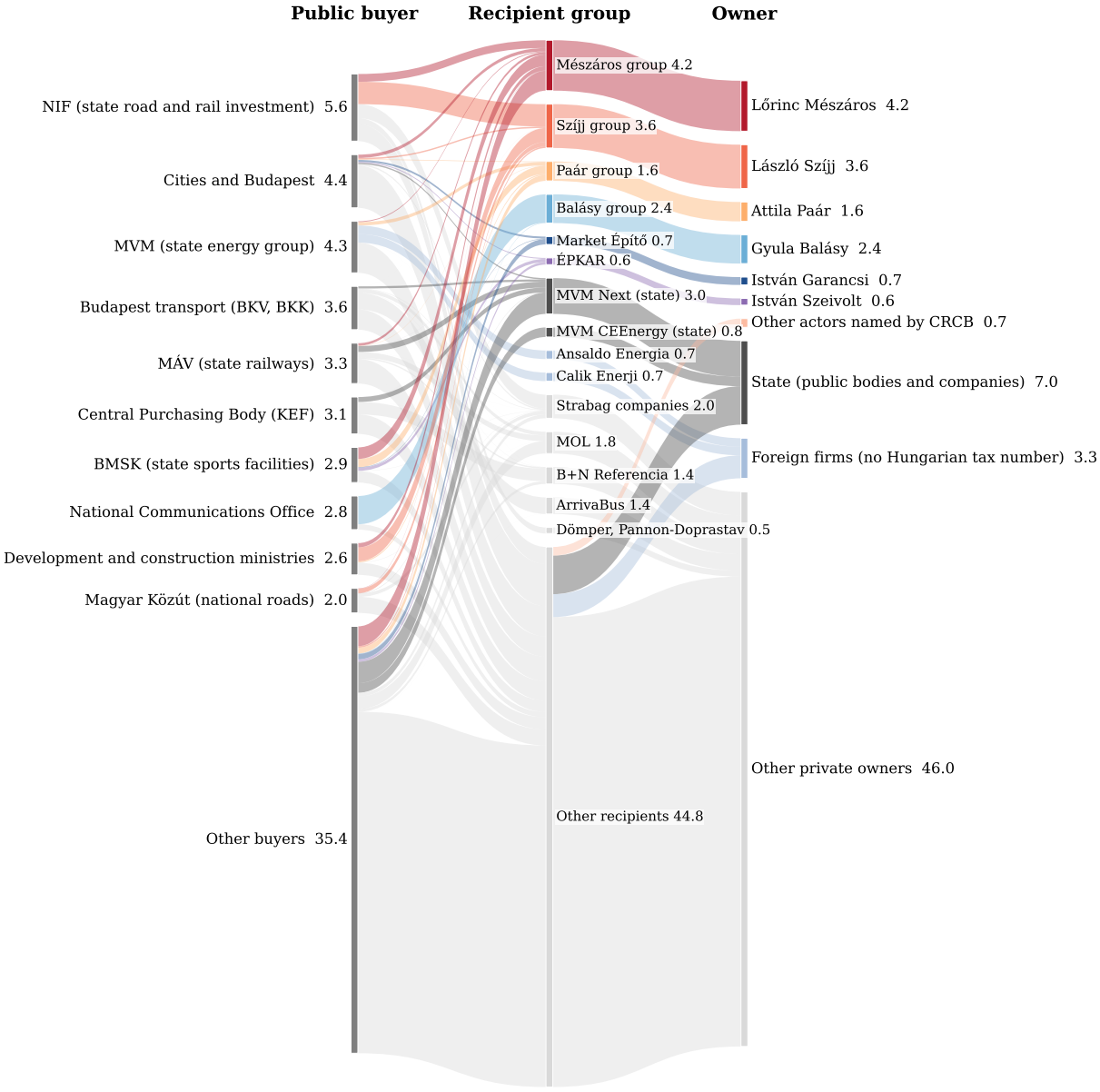


Figure S12: From public buyers to the largest recipient groups and their owners, EKR registry, 2018 – 8 May 2026 (EUR billion, all procurement regimes). Recipient groups combine Tenderbajnok principal owners, dated VAT groups and disclosed parent/actor association fallbacks; the latter are not verified common ownership. Owners are named only where CRCB or the Integrity Authority names them and are otherwise shown by type: "State" covers public bodies and publicly owned companies, and foreign firms are those without a Hungarian tax number. Net contract value at signature, consortium values split equally, framework ceilings and concessions excluded. Source: EKR contract registry, Tenderbajnok; author's calculations.

Table S17: Concessions and state transactions outside procurement, verified against primary sources, 2010–2026

Year	Channel	Counterparty	CRCB link	Amount	Primary source
2018	Concession	Hunguest Hotels Zrt.	none on CRCB's list	Concession value stated in the award notice: HUF 15.9bn	Nyíregyháza and Kaposvár City Councils (2021)
2020	State purchase	Status Power Invest Kft., owner of Mátrai Erőmű and Geosol (sellers: Opus Global Nyrt. and Status Energy Magántőkealap)	none on CRCB's list	Purchase price: HUF 17.4bn	MVM Magyar Villamos Művek Zrt. (2020)
2021	Concession	Hunguest Hotels Zrt.	none on CRCB's list	Concession value stated in the award notice: HUF 21.8bn	Nyíregyháza and Kaposvár City Councils (2021)
2022	Concession	Consortium of seven private equity funds (Themis, Konzum PE, Opus Bridge, Opus New Way, Via, Cronus and Vesta Magántőkealap)	none on CRCB's list	Availability fee paid in 2022–2024: HUF 416.2bn; appropriated for 2025: HUF 370.0bn, for 2026: HUF 210.0bn	Nemzeti Koncessziós Iroda (2022b); Parliament of Hungary (2025a,b)
2022	Concession	MOL Nyrt.	none on CRCB's list	Concession value stated in the award notice: HUF 3.5bn	Nemzeti Koncessziós Iroda (2022a)
2022	Transfer of a state company	4iG Nyrt.	CRCB Annex A3 (Lőrinc Mészáros and Gellért Jászai since 2019)	Telecommunications assets contributed in two capital increases for a 76.78% stake: HUF 534bn	4iG Nyrt. (2022)
2023	State purchase	Vodafone Magyarország Zrt. (seller: Vodafone Group)	CRCB Annex A3 (4iG as co-buyer)	Cash consideration for 100%: HUF 660bn	Vodafone Group (2023); 4iG Nyrt. (2023)

Notes: Selected large transactions under the Fidesz-led governments that pass outside the procurement data of Section 5.3 of the main paper, each checked against an official record (TED notices, budget and final-accounts acts) or the parties' own disclosures. "CRCB link" is CRCB's association of a company with a person in Annex A3 (Corruption Research Center Budapest 2026a); it does not imply wrongdoing. Concession values stated in award notices estimate the operator's turnover, not public payments. Amounts measure different things (payments, prices, contributed assets) and are not additive. Original-source links and documentary locators are provided in the references and the archive's source catalogue; underlying source PDFs are not redistributed.

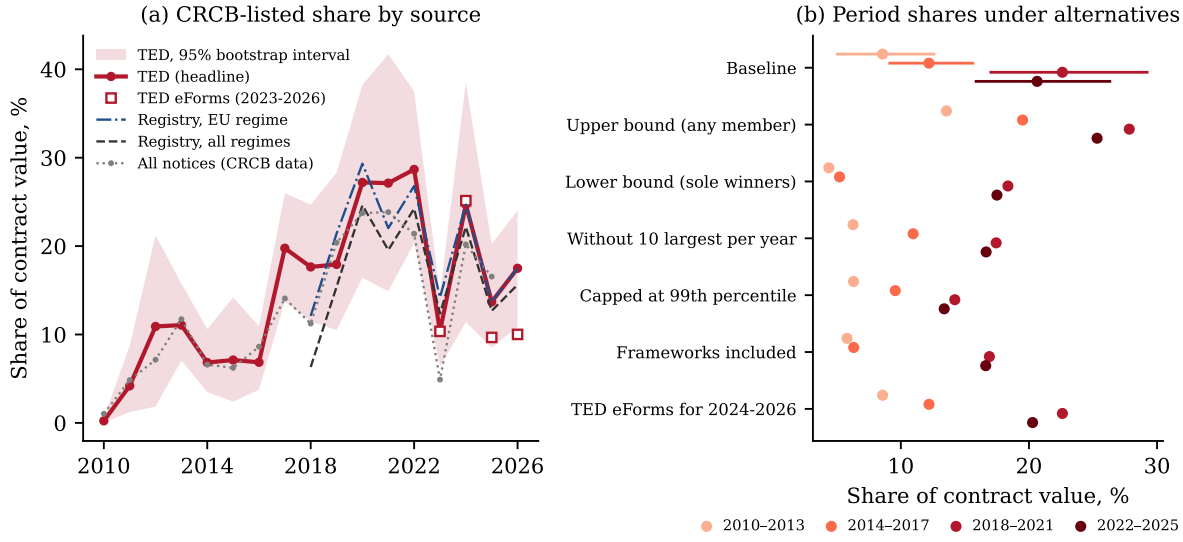


Figure S13: Robustness of the CRCB-listed share of contract value above the EU thresholds. Panel (a): annual share in the headline series (TED award notices to 2023, registry EU-regime contracts from 2024) with a 95% bootstrap interval (notices resampled within years), TED's eForms notices (squares), the registry's EU-regime and all-regime contracts, and CRCB's national-register data for all notices (framework ceilings partly included). Panel (b): period shares under the alternatives of Table S18; horizontal lines: bootstrap intervals of the baseline. 2010: from 29 May; 2026: to 8 May. Source: TED, EKR contract registry, Corruption Research Center Budapest (2026b); author's calculations.

Table S18: Robustness of the share of contract value won by CRCB-listed companies above the EU thresholds

A. Share of value (%) under alternative accounting choices	2010–13	2014–17	2018–21	2022–25	2010–26
Baseline (equal split of consortium awards)	8.6	12.2	22.6	20.6	17.5
95% bootstrap interval	[5, 13]	[9, 16]	[17, 29]	[16, 26]	[15, 20]
Full value to any listed member (upper bound)	13.6	19.5	27.8	25.3	23.0
Only awards won entirely by listed companies (lower bound)	4.4	5.2	18.4	17.5	13.0
Without the 1 largest award of each year	9.3	11.2	20.8	18.9	16.3
Without the 5 largest awards of each year	8.5	11.4	20.6	17.9	15.8
Without the 10 largest awards of each year	6.3	11.0	17.4	16.7	14.1
Values capped at each year's 99th percentile	6.3	9.6	14.2	13.4	11.7
TED values as exported (no notice-XML corrections)	7.6	10.7	22.5	20.6	16.7
Framework agreements included at reported value	5.8	6.3	16.9	16.6	12.0
Multi-winner lots and repeated values kept as contracts	8.4	12.2	22.5	19.9	17.2
Extended affiliation (adds RM International)	8.6	12.2	23.9	20.6	17.9
TED eForms notices for 2024-2026 instead of the registry	8.6	12.2	22.6	20.3	17.2
B. Share of value within contract types (%), and their weight in total value (%)					
Works: listed share	19.5	24.7	36.7	39.7	32.2
weight in total value	43	46	53	40	46
Supplies: listed share	0.7	2.3	10.3	5.0	5.5
weight in total value	19	24	25	27	24
Services: listed share	0.2	0.6	2.5	10.5	5.0
weight in total value	38	30	22	34	30

C. Tests on the annual shares, 2010–2025	
Linear trend, pp per year (Newey–West s.e.)	1.32 (0.37)
p-value; Kendall's τ (p-value)	<0.001; 0.53 (0.003)
Mean 2018–2025 minus mean 2010–2017, pp (year-label fraction)	12.5 (0.003)
Years after an election minus other years 2011–2025, pp	−7.8
year-label fraction, one-sided; two-sided	0.056; 0.114
deviations from trend, pp (fractions, one-sided; two-sided)	−6.2 (0.057; 0.105)
Change 2010–13 to 2018–21, pp: within contract types; between types	11.1; 2.9

Notes: Headline sample of Table S8: awards of Hungarian buyers above the EU thresholds, 29 May 2010 – 8 May 2026 (TED award notices to 2023; EKR registry EU-regime contracts from 2024). Panel A: the upper bound gives the whole value of a consortium award to a listed member; the lower bound counts only awards won entirely by listed companies. The largest awards are dropped whoever won them. Exported TED values exclude the corrections from the notice texts. Bootstrap: awards resampled by notice within years, 999 replications; the intervals show how far the shares depend on particular large contracts. Panel C: enumeration over all 1,365 ways of choosing four of the fifteen years 2011–2025, with fractions lacking calibrated randomisation validity under temporal dependence, trend and non-random assignment; the shift-share decomposition uses average weights and shares of the two periods.

Table S19: Registry totals compared with the Integrity Authority, 2024 (HUF billion)

Company (Integrity Authority rank)	Integrity Authority	This paper	
		Equal split	Lead only
Duna Aszfalt Út és Mélyépítő Zrt. (1)	452.3	474.5	501.3
ArrivaBus Kft. (2)	356.9	356.9	356.9
B + N Referencia Zrt. (3)	92.7	156.8	156.8
MVM Next Energiakereskedelmi Zrt. (4)	84.4	138.6	138.6
4iG Nyrt. (5)	80.2	23.6	22.4
New Land Media Kft. (6)	79.9	54.6	105.5
Lounge Event Kft. (7)	75.4	75.9	80.7
MVM CEEnergy Zrt. (8)	70.0	70.0	70.0
Telekom Rendszerintegráció Zrt. (9)	67.5	7.0	7.9
Delta Systems Kft. (10)	67.3	5.7	6.9
All contracts	3,740.4	3,725	
Top-10 share, companies (%)	38.3	39.0	
Top-10 share, owner groups (%)	44.0	43.7	

Notes: Integrity Authority figures from its 2024 annual report (Table 8), which uses the EKR result-notice database and excludes framework agreements. Our figures use the EKR contract registry by signing year, the Authority by notice year; framework agreements are ceilings and are excluded, call-offs are included. Large differences arise where a firm's awards are mainly shares of multi-supplier framework agreements (IT licences), which we do not count as spending; other differences, such as B + N Referencia's, may reflect the different dating rules. Top-10 shares use equal consortium splits.

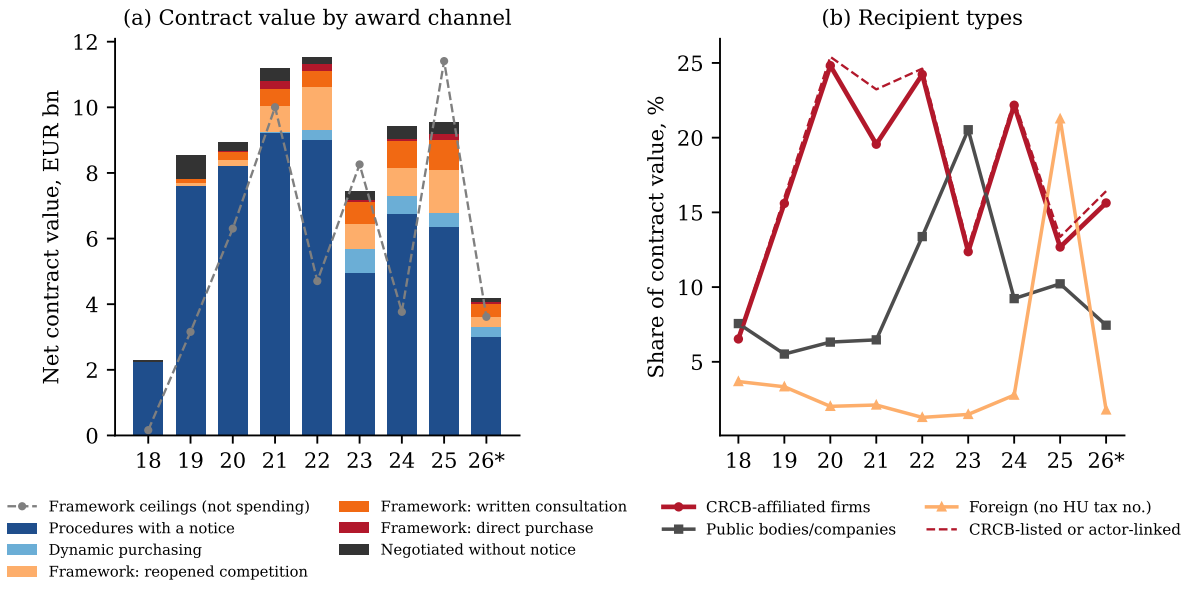


Figure S14: EKR contract value by award channel and recipient type, 2018–2026. Panel (a): net contract value at signature by channel (EUR billion); the dashed line shows framework-agreement ceilings, which are not added to spending. Panel (b): shares of annual contract value received by CRCB-listed companies, by these and broader actor-linked firms together, by public bodies and publicly owned companies, and by firms without a Hungarian tax number. 2018 is incomplete; 2026 covers contracts decided before 9 May. Source: EKR contract registry; author's calculations.

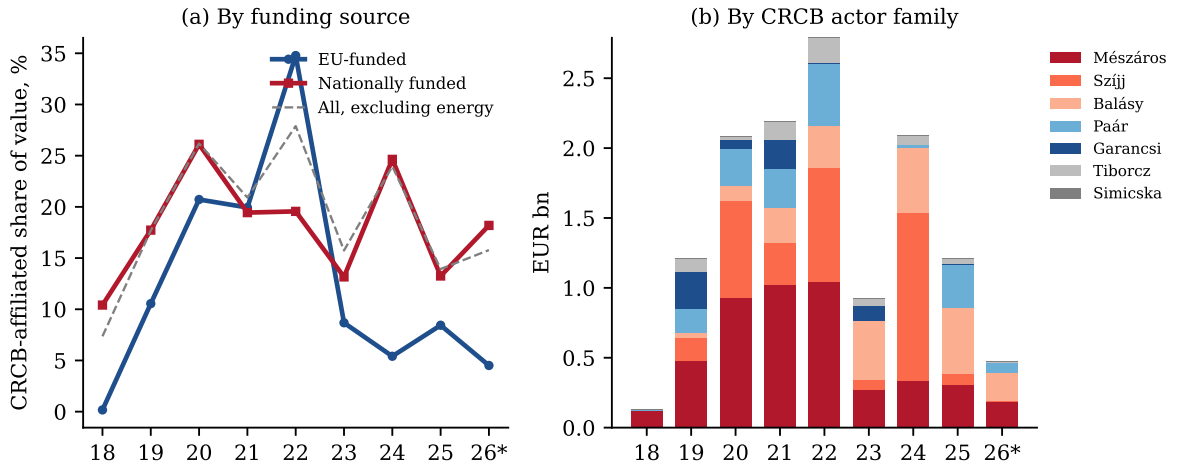


Figure S15: Contract value received by CRCB-listed companies, 2018–2026. Panel (a): share of EU-funded and nationally funded contract value, all procurement regimes; the dashed line excludes energy purchases. Panel (b): value by the actor family to which Corruption Research Center Budapest (2026a, Annex A3) assign each company (EUR billion). Source: EKR contract registry; author's calculations.

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