Näkökulmia kilpailuun julkisissa hankinnoissa

Janne Tukiainen (Turun yliopisto)

Julkisten hankintojen yhdistys: Tutkimusseminaari I

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Esityksen sisältö

- Kilpailun määrä julkisissa hankinnoissa, ja sen syitä ja seurauksia (Halonen, Jääskeläinen, Tukiainen 2019/2020/2022)

- Hankkijoiden preferenssit (Tukiainen, Blesse, Bohne, Giuffrida, Jääskeläinen, Luukinen, Sieppi 2021)

- Toimenpidesuosituksia meidän tutkimusten ja kv. kirjallisuuden valossa (etenkin Titl 2021)

Data

- Kattava data 2010-luvulla tehdyistä hankinnoista Suomesta ja Ruotsista
  - Suomen aineisto on yksityiskohtaisempaa ja sisältää yli 18000 hankintaa vuosilta 2010 - 2017
  - Ruotsin aineisto on yleisemmällä tasolla, mutta sisältää yli 130000 hankintaa vuosilta 2012 - 2018
- Suomen aineistoissa on tietoa itse hankinnoista sekä kaikista tarjouksista
- Merkittävää on myös tieto potentiaalisista tarjoajista (rekisteröinneistä) Suomen aineistossa
- Yhdistämme Suomen aineiston Tilastokeskuksen työntekijä-työnantaja aineistoon FLEED (2010-2017)

Amount of competition

Table 1: Shares of ITTs with a given number of actual or potential bidders in Finland and Sweden

	ITT level					Auction level		
	Finland			Sweden		Finland		
count	bidders (n)	bidders (n>0)	registrations (N)	bidders (n)	bidders (n>0)	count bracket	bids	bids (n>0)
0	31.72 %		7.17 %	22.95%		0 - 0.99	35.14 %	6.88 %
1	15.15 %	22.18 %	8.81 %	14.93%	19.38%	1 - 1.99	17.23 %	23.37 %
2	14.37 %	21.04 %	10.19 %	15.41%	20.00%	2 - 2.99	15.50 %	22.70 %
3	11.31 %	16.57 %	11.56 %	13.69%	17.77%	3 - 3.99	11.45 %	16.76 %
4	8.01 %	11.73 %	10.50 %	9.86%	12.80%	4 - 4.99	6.94 %	10.16 %
5	5.07 %	7.43 %	9.13 %	6.85%	8.89%	5 - 5.99	4.50 %	6.59 %
6	3.60 %	5.27 %	7.17 %	4.55%	5.90%	6 - 6.99	2.79 %	4.09 %
7	2.35 %	3.44 %	6.24 %	3.04%	3.94%	7 - 7.99	1.86 %	2.72 %
8+	8.43 %	12.35 %	29.22 %	8.72%	11.32%	8 -	4.60 %	6.73 %
obs	17,944	12,253	17,944	131,601	101,397		17,944	12,253

Effects of competition

Table 2: OLS and 2SLS regressions on the effects of competition on price

	OLS			IV		
	Full sample	$n \leq 6$	$n > 6$	Full sample	$n \leq 6$	$n > 6$
First stage				0.179***	0.0785***	0.0256
				(0.0403)	(0.0217)	(0.0137)
n	-0.0171***	-0.0233***	-0.0123*	-0.0261**	-0.0517*	-0.0198
	(0.00154)	(0.00222)	(0.00520)	(0.00814)	(0.0249)	(0.0787)
Constant	0.150***	0.161***	0.281***	0.172***	0.239**	0.343
	(0.0246)	(0.0284)	(0.0481)	(0.0370)	(0.0815)	(0.608)
Observations	95602	83258	12344	94943	82640	12303
R-squared	0.08	0.08	0.06	0.07	0.05	0.06
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: In the first stage, we regress the instrument N^{IV} on the number of actual bidders n. 2-digit CPV classification is used for industry fixed effects. The unit of observation is an auction. Standard errors are clustered at the industry level. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
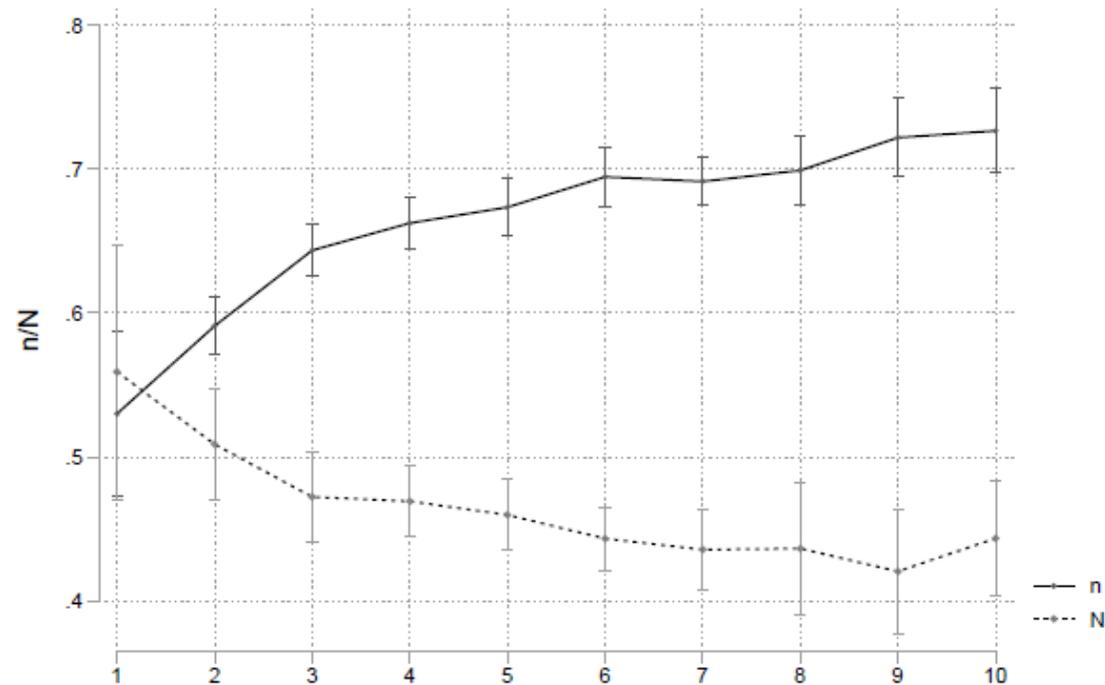
Lack of potential bidders or entry costs?

Figure 3: Predicted mean n/N for for n and N respectively

Notes: Predicted means and their 95% confidence intervals are obtained by regressing n/N on n and N dummies respectively. We control for contracting authority and industry group fixed effects as well as the procurement method. Standard errors are clustered at the 2-digit CPV category level. Estimates available only for Finland.

Miten lisätä kilpailun määrää?

- Ongelmat vaihtelevat eri tarjouskilpailujen välillä: edellyttää tapauskohtaista analyysiä
- Resurssien ja osaamisen lisääminen HY:ssä: kategoria- ja sopimusosaaminen, suunnitelmallisuuden, johtamisen ja sopimusvalvonnan parantaminen, Viestinnän ja avoimen kommunikaation lisääminen, ja kumppaniajattelu
- Toiminnallisuuksien määrittäminen tiukkojen vaatimusmäärittelyjen sijaan
- Eroon "hallinnollisten kustannusten minimointi" -ajattelusta
- Uusien yritysten (uusien tarjoajien) tukeminen ja tarjoamisen helpottaminen:
    - Ovatko kaikki potentiaaliset tarjoajat löytäneet asiakirjat, voisiko tarjousaika olla pidempi, ovatko kaikki selvitykset ja näytteet tarpeen ja ovatko ehdot toimialalle tyypillisiä
- Nackan kunta: esimerkki onnistuneesta muutoksesta

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Johtopäätökset

- Vakava puute kilpailusta julkisissa hankinnoista yli maiden, toimialojen, hankkijatyyppien, alueiden ja ajan
- Tämä on ongelma, koska kilpailulla näytää olevan toivotunlaiset vaikutukset hintaan

    Kilpailun määrän lisääminen vain yhdellä tarjoajalla voisi tuoda noin 5%:n kustannussäästöt

- Kilpailua olisi hyvä saada lisää, mutta se voi olla käytännössä vaikeaa.
    - HY:llä ei välttämättä aina osaamista tai resursseja
    - Kilpailun lisäämistä ei aina edes tavoitella: ajatus "parhaista" toimittajista, hallinnollisten kustannusten minimointi (vanhat asiakirjapohjat, ei osiin jakamista, yksi sopimuskumppani)
    - Toistaiseksi omia tarjouskilpailuja seurataan "kriittisesti" hyvin harvassa HY:ssä
    - Tarvitaan vahvempaa tukea organisaation strategiasta
    - Kattohintojen käyttö voi olla yksi ratkaisu lieventämään kilpailun puutteesta aiheutuvia ongelmia

What Are the Priorities of Bureaucrats?
Evidence from Conjoint Experiments with Procurement Officials

Tukiainen (UTU), Blesse (ZEW), Bohne (ZEW),
Giuffrida (ZEW), Jääskeläinen (Aalto), Luukinen (FCCA),
Sieppi (FCCA)

Context and Research Question

- Analysis in the context of public procurement (PP)

  - Relevant worldwide ($\approx 1/7$ GDP and $1/3$ public budget)
  - Ideal laboratory to study bureaucratic behavior due to its cross-institutional nature
  - POs have high discretion (with much analysis of the implications)

- Specifically, what are the preferences of public procurement officials (POs) regarding tender outcomes (i.e., the result of the contract awarding process)?

- Relevant question as tax-payers and bureaucrats are in a principal-agent relationship with potentially misaligned interests (especially when it comes to POs!).

  - E.g. Do POs' preferences contribute to the pathological lack of competition observed in PP (EC 2017, Jääskeläinen and Tukiainen 2019, Kang and Miller 2020)?

Contribution

- ▶ Our contribution in the growing literature on the personnel economics of the state (Finan, Olken, Pande 2017) is to add the focus on preferences of bureaucrats to selection, incentives, and monitoring

- ▶ First tailor-made survey experiments in economics among real-world POs & first experimental evidence on bureaucratic preferences when making complex day-to-day work decisions

- ▶ Several contributions in the economics of public procurement literature
    - ▶ buyers' role (e.g., Bandiera et al. 2009; Best et. al. 2017; Decarolis et al. 2020, 2021)
    - ▶ competition drivers (Kang-Miller 2017; Coviello et al. 2018)
    - ▶ reputational implications (Decarolis et al. 2016, Butler et al. 2020)
    - ▶ favoritism (Baltrunaite 2019, Kutlina-Dimitrova and Lakatos 2016)
    - ▶ interaction with courts (Coviello et al. 2018)

Why a Conjoint Experiment?

- ▶ Typically, it's hard to study 'anatomy' of POs preferences because:
    - ▶ bureaucrats make choices as a result of multiple trade-offs with different constraints/optimization problems
    - ▶ observational data on procurement outcomes only shows aggregate realizations of choices of POs (and bidders).
- ▶ Goal: quantify relative importance of different attributes of PP outcomes through a survey among real-world POs
- ▶ To do so, we use the **conjoint experiment method**
- ▶ Powerful tool to evaluate 'relative' treatment effects under complex trade-offs (Hainmüller et. al. 2014):
    - ▶ allows quantifying relative importance of single attributes of multi-dimensional choice framework
    - ▶ isolates the underlying preferences from real-world constraints
    - ▶ no experimenter bias

Sample and set-up of survey

- Experiment comes with a cross-country web-based survey in native language among POs based in two countries
  - Finland (1,301 contacts, 414 complete respondents) conducted by the Finnish Competition Authority (FCCA)
    - Contacts from administrative database of PP notices ("Hilma"), representing universe of unique PO contacts on mandatory online PP platform
    - Finnish sample representative office-wise (comparable descriptives + no selective response)
  - Germany (7,247 contacts, 540 complete respondents) in cooperation with DVNW, the leading national platform for PP-related news and information (survey still organized by FCCA)
    - German contacts not fully representative (unlike in Finland)
- We also ask about individual and institutional environment features
- Frontline and back-office POs at all levels of government (large variation in office size, type, job tasks & hierarchy etc.)
- Through our partners, we field an anonymous online survey (ca. 15 mins) plus two reminders

Conjoint Experiment - framing

- ▶ To elicit preferences, bureaucrats decide and 'trade-off' repeatedly (and under hypothetical full discretion) between pairs of fictional tender outcomes which randomly vary
  - ▶ price/quality of winning bid
  - ▶ reputation and regionality of winner
  - ▶ degree of competition in tender process
  - ▶ filing of judicial complaints
- ▶ Focus on POs' choices of favorite tender outcomes that always imply multiple underlying preferences/trade-offs
  - ▶ E.g., local small businesses at risk of poor performance? Costs vs. benefits of competition? Price vs. quality?
- ▶ Timing: i) bids are in, ii) winner is chosen and iii) losers have had the time to litigate, BUT iv) no post-award info
- ▶ Decision scenario is
  - ▶ familiar to all respondents across inst. backgrounds
  - ▶ relevant for all procurements & job tasks
  - ⟹ the elicited choices are realistic and relevant for as many procurers as possible

Conjoint experiment - Choice example

Please look at the following pair of hypothetical tender outcome scenarios carefully and make a decision which you would like more.

Which tender outcome scenario do you prefer?

	Tender outcome A	Tender outcome B
The selected winner is	a firm I already know from previous tenders and trust	a firm that was unknown to me through previous tenders
After awarding the contract, was a legal complaint filed against the tender?	No	No
The tender received	4 bids	8 bids
The quality of the purchase as promised in the winning bid is	a bit better than I expected	much better than I expected
The selected winner is	a local bidder from your region	a non-local bidder that does not come from your region
The price as stated in the winning bid is	much higher than I expected	much lower than I expected
	○	○

Next

# The Conjoint Experiment - What are we aiming for?

- ▶ Pairs of different tender outcome scenarios are presented $R = 6$ times to N (actual) respondents.
- ▶ Each outcome scenario consists of J_k realizations of the following $K = 6$ attributes
    - ▶ Price in the winning bid (5)
    - ▶ Quality as promised in the winning bid (3)
    - ▶ No. of actually submitted bids (4)
    - ▶ Judicial complaints actually filed by losing bidders (2)
    - ▶ Previous experience with the winning bidder (3)
    - ▶ Location of the winner (2)
- ▶ Each round subjects pick a preferred outcome scenario - i.e. as they would like to see realized in their daily work - based on the different realizations of these attributes (720 possible combinations)
- ▶ Set-up allows enhanced realism and decreases social desirability bias

The Conjoint Experiment - What are we estimating?

- ▶ Estimation sample based on stacked individual scenario decisions (for Finland $R*N$ is $6*414 = 2,484$ decisions * 2 cards)

- ▶ Fixed-effects LPM: We regress the binary outcome of support for a tender outcome scenario (chosen card) on a set of dummy variables for each attribute level, except for one per domain to facilitate comparisons with the baseline.

- ▶ We estimate the average marginal component effect (AMCE): analysis allows to see 'relative' importance of an attribute's realization (e.g., price as expected) as compared to other attributes (e.g., quality) and thus, allows to study multiple decision trade-offs (i.e., price/quality)

- ▶ 3 (validated) assumptions for identification: 1) attribute levels randomly assigned to each profile. 2) no carryover effects for the potential outcomes. 3) no profile-order effects

Main Results
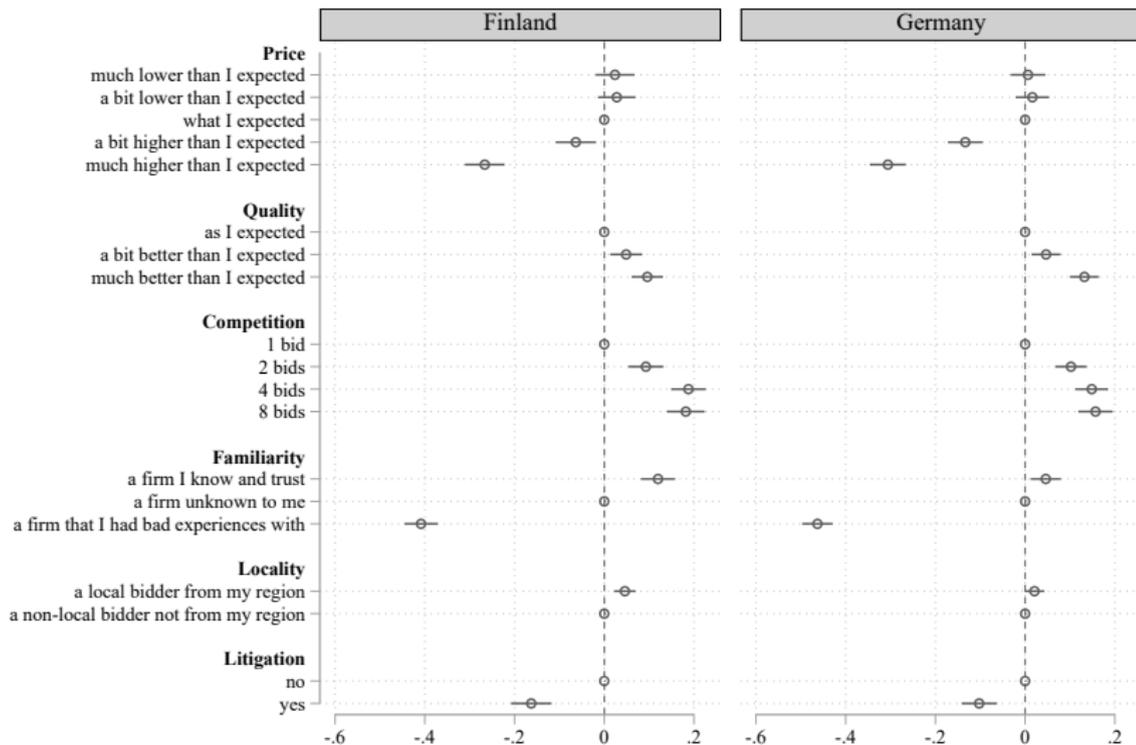
Discussion of conjoint results

- ▶ Avoiding negative realizations of supplier reputation and prices more important than grasping positive realizations.
  - ▶ This is consistent with loss-averse public buyers
- ▶ It is more important to avoid bidders with bad past performance than to elude unexpectedly high prices
- ▶ They value a certain amount of competition even conditional on bid price-quality combinations
- ▶ Expected effects of litigations (-) and regionality of winner (+), but small

Background and follow up questions

Before the conjoint experiment, we enquire about the following information

- ▶ *Demographics*: age, gender, education.

- ▶ *Actual job characteristics*: working tasks, tenure, tender and awarding procedures, purchase category, hierarchy status

- ▶ *Perceived job characteristics*: discretion, workload, frequency of complaints, competition

- ▶ *Organizational features*: size, award figures, government level

After the conjoint experiment, we ask a few follow-up questions (in randomized order)

- ▶ Which factors matters for career concerns? ▸ career

- ▶ Which factors are prioritized in practice? ▸ practices

- ▶ Which factors are desirable? ▸ preferences

Descriptive Results & Subgroup Analysis

- ▶ Responses on the work environments in our settings underscore the relevance of our research question as POs in both countries

  - ▶ perceive to have substantial amount of discretion ▶ discretion
  - ▶ do not perceive PP outcomes as important for their career, i.e. suggestive for lack of extrinsic incentives ▶ incentives
  - ▶ view rigid regulation as one of the largest obstacles to desirable work outcomes.

- ▶ We test battery of mechanisms via sub-group analysis

  - ▶ No significant decision differences between sub-groups
    ▶ award mechanism ▶ workload ▶ boss or not?

- ▶ How so?

  - ▶ Intrinsic motivation vs. adherence to rules?
  - ▶ Plausibility checks (i.e., stated behavior to rule out a key alternative explanations)

Discussion

- ▶ Plausibility checks: follow-up questions of most and least important attributes correspond with conjoint results in the sense that effect magnitudes vary in line with follow-up responses
    - ▶ POs pursue quality and reputation in practice ▸ practices
    - ▶ Perceived PP goals are aligned with subjective POs' preferences ▸ preferences
- ▶ Large difference in factors b/w the two countries things are indicative of institutional differences
    - ▶ Yet, subgroup analysis for both preferences & factors do not suggest strong differences on choice formation $\implies$ **intrinsic motivation rather than merely institutional constraints**

Conclusions

- ► Unique survey experiments among real-world POs & first experimental evidence on bureaucratic preferences

- ► Estimate the relative importance of specific attributes determining their individual preferences for procurement tender outcomes

- ► Bureaucratic preferences are sensible and sophisticated and useful to open up puzzle "high discretion/low incentives/good outcomes"

    - ► Priority on avoiding bids from suppliers with bad reputation
    - ► Also avoid large prices and value sufficient competition
    - ► The size of the effects in case of negative realizations is considerably stronger than for positive ones.
    - ► Litigation and regionality concerns are of minor importance

- ► Choices + stated behavior + different context consistent with intrinsic motivation

Policy lessons

- ▶ It seems we should not be that concerned with lack of discretion, resources, sophistication or skills in Finland or Germany

- ▶ PO's lack incentive structure (e.g., to seek very low prices). But we have to be careful not to crowd out intrinsic motivation

- ▶ In the big picture, reasons for the lack of competition seem to be elsewhere than at POs preferences!

- ▶ Should we be more concerned with regulation and entry barriers (e.g., secondary objectives)?

- ▶ Should PO's be empowered to reward/punish for past performance? We need less strict EU regulation here? Results consistent with Spagnolo and coauthors' empirical work

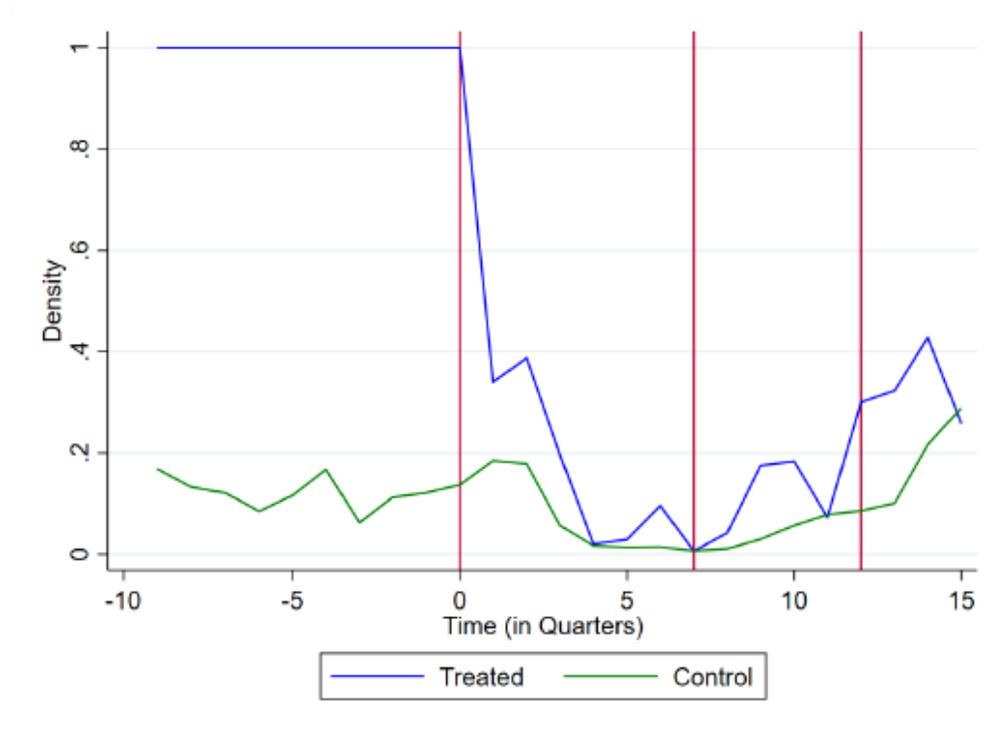# Titl (2021): Regulation prohibits single-bid contracts

Figure 1: Single-bid contracts over time (between the 2 left red vertical lines, the enforcement of the competition was in power). The first red vertical line represents the time of the reform (4/1/2012). The two red vertical lines on the right represent the two following reforms in 2014 and 2015 that first partially and then fully abolished the reform from 2012.

Titl (2021): Regulation prohibits single-bid contracts
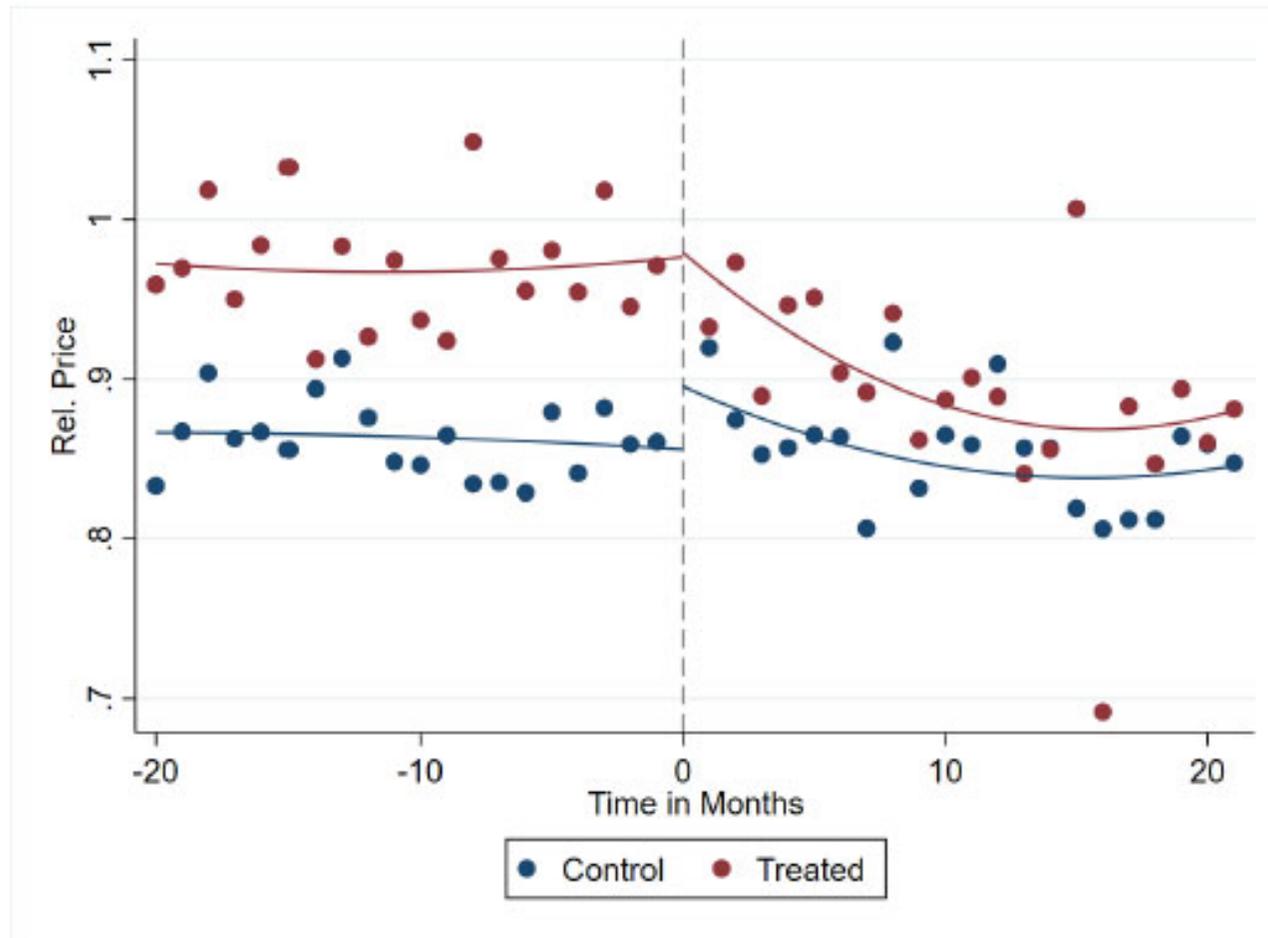
Econometrics of the Conjoint Analysis

▶ Randomize each k-th j + attribute order for each n yet fixed for n

▶ Few (indep.) R rounds to the same n will ensure sufficient power and allow to replicate a lab-experiment with $N * R$ individuals

▶ Relative importance of each dimension non-parametrically identifiable as an average marginal component effect (AMCE)

▶ Binary outcome (i.e. the chosen card z, n, r) is regressed on each ordered categorical realization j of each attribute k

    ▶ lowest-utility realization ruled out to benchmark estimates

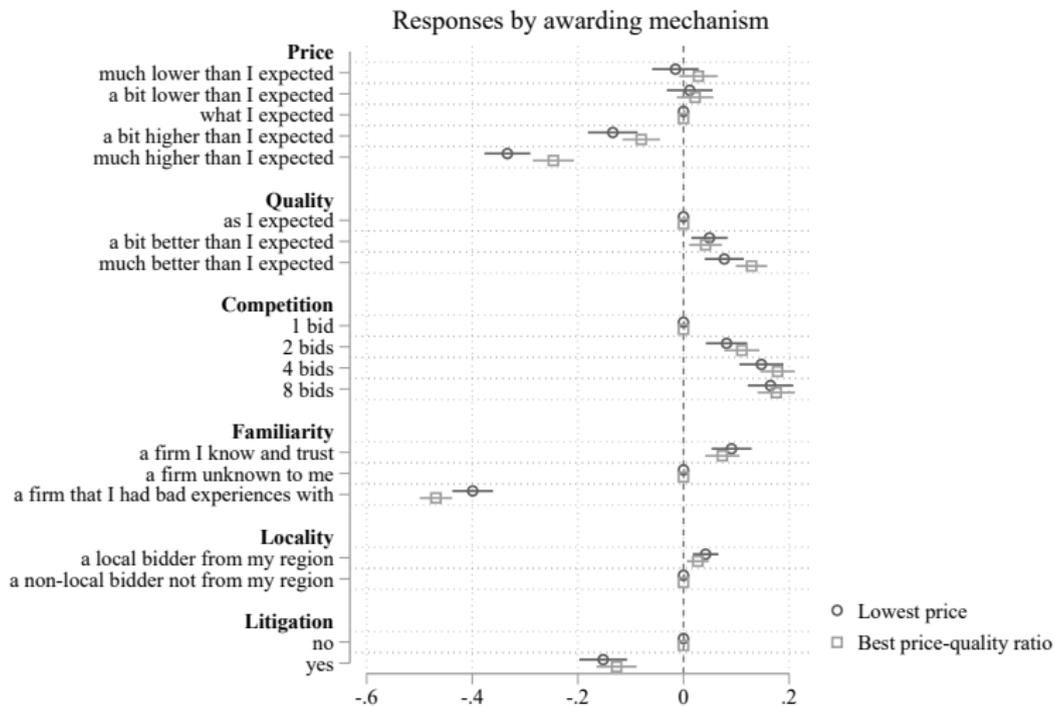$$Card_{z,n,r} = \alpha + \sum_{k=1}^{K} \sum_{j=1}^{J^k} \beta_{k,j} * x_{k,j} + \mu_r + \epsilon_{z,n,r}$$

$$x_{j,k} = \begin{cases} 1 & \text{realization } j \text{ on attribute } k \\ 0 & \text{otherwise} \end{cases}$$

▶ $\widehat{\beta_{k,j}} \equiv \overline{\beta_{k,j} - \beta_{k,j(min)}} \, \forall \, k, j \neq k, j(min)$ is the estimated AMCE i.e, the utility of every $x_{j,k}$ compared to their k-th baseline
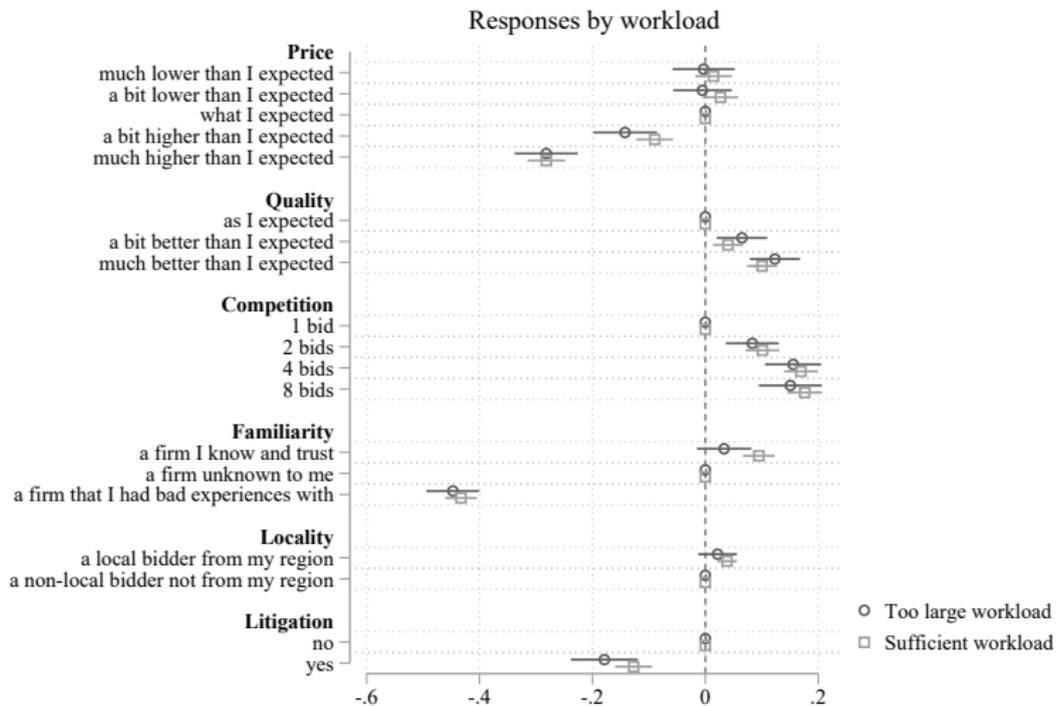
Overview of Validity Checks

▶ Carryover effects: Do previously seen profiles impact subsequent choices? Unlikely given randomization, but test by analyzing separately each response round

▶ Profile-order effects: E.g. is the effect of competition different if price is listed first? Unlikely due to order randomization between subjects but test by interacting attribute level with their order

▶ Results robust to controlling for background characteristics and respondent or card FE, using logit or MHT adjustments

▶ External validity: heterogeneous respondents (both) and sample representiveness and non-systematic non-response (Finland)
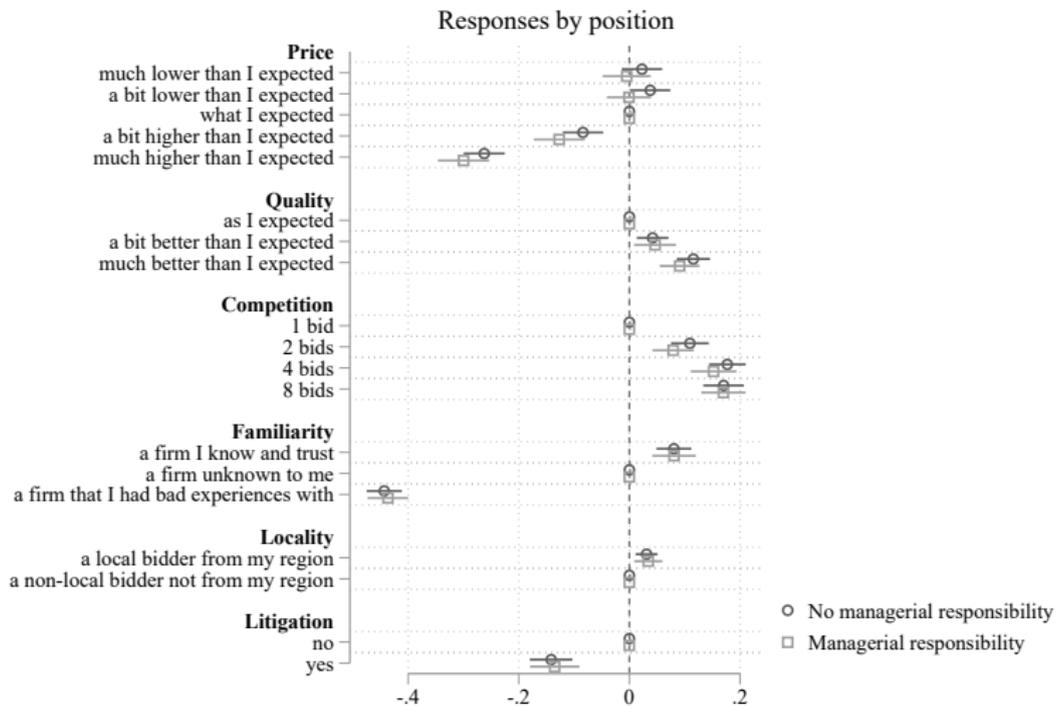
Heterogeneity by award mechanism

Responses by awarding mechanism

Heterogeneity by workload

Responses by workload

Price
- much lower than I expected
- a bit lower than I expected
- what I expected
- a bit higher than I expected
- much higher than I expected

Quality
- as I expected
- a bit better than I expected
- much better than I expected

Competition
- 1 bid
- 2 bids
- 4 bids
- 8 bids

Familiarity
- a firm I know and trust
- a firm unknown to me
- a firm that I had bad experiences with

Locality
- a local bidder from my region
- a non-local bidder not from my region

Litigation
- no
- yes

○ Too large workload
□ Sufficient workload

-.6   -.4   -.2   0   .2

◂ back

Heterogeneity by job hierarchy

Responses by position

Price
much lower than I expected
a bit lower than I expected
what I expected
a bit higher than I expected
much higher than I expected

Quality
as I expected
a bit better than I expected
much better than I expected

Competition
1 bid
2 bids
4 bids
8 bids

Familiarity
a firm I know and trust
a firm unknown to me
a firm that I had bad experiences with

Locality
a local bidder from my region
a non-local bidder not from my region

Litigation
no
yes

○ No managerial responsibility
□ Managerial responsibility

-.4   -.2   0   .2

Follow up question I

27. Please evaluate which of the following factors is important for your **career prospects**.

Pick only one answer category to be either the most and the least important factor for your career prospects. Note that you can only pick one answer category to be either the most or the least important factor for your career prospects, respectively. This means that for each row (Most important/Least important) you can only select one answer.

	Select a winner that one can trust	Avoid legal complaints	Receive a high number of bids	Ensure a high quality purchase	Support local firms	Ensure a low price
Most important	○	⊙	○	○	○	○
Least important	⊙	○	○	○	○	○

Submit

◂ back

Follow up question II

25. Which of the following factors best describes the goals you do or do not pursue in your **daily work**?

Note that you can only pick one answer category for the goals that you actively do or do not pursue in your own work, respectively. This means that for each row (I actively try to… / I do not actively try to…), you can only select one answer.

	Select a winner that one can trust	Avoid legal complaints	Receive a high number of bids	Ensure a high quality purchase	Support local firms	Ensure a low price
I actively try to…	○	○	○	○	○	○
I do not actively try to…	○	○	○	○	○	○

Next

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Follow up question III

24. Please evaluate which of the following factors is important for a **desirable tender outcome**.
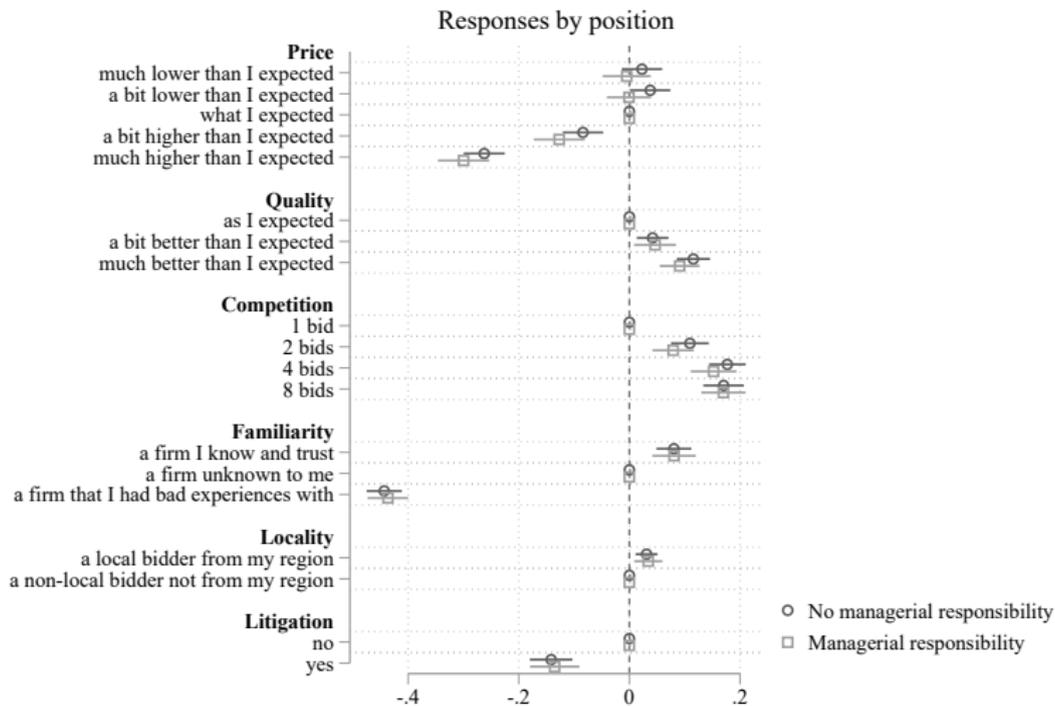
Note that you can only pick one answer category to be either the most and the least important factor for determining a desirable tender outcome, respectively. This means that for each row (most important/least important), you can only select one answer.

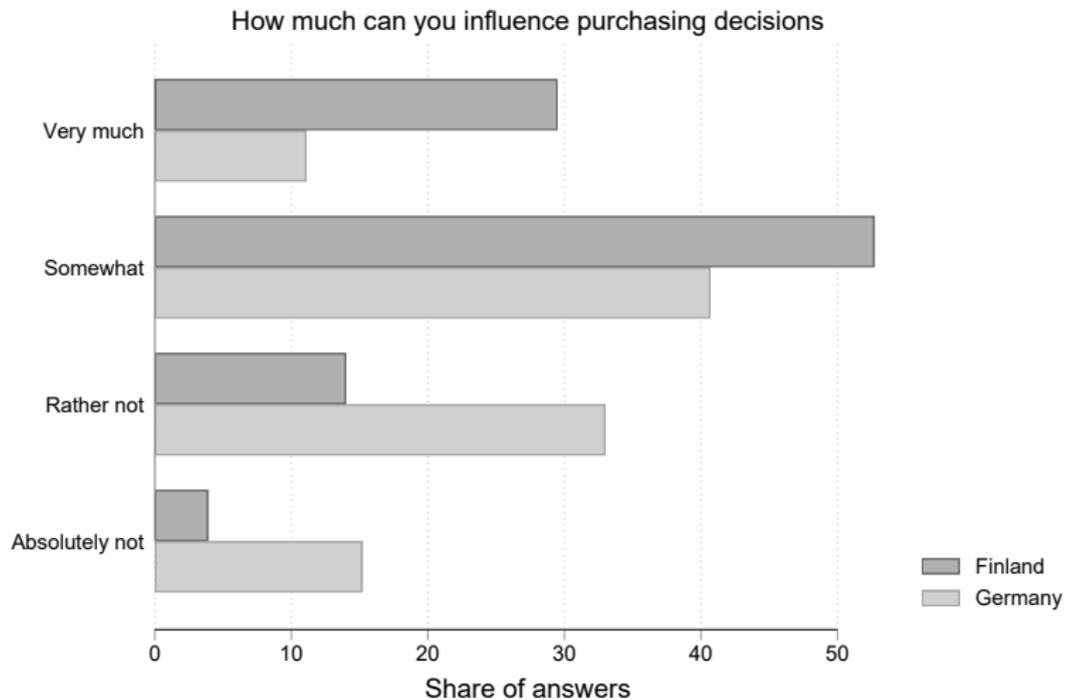|	Select a winner that one can trust	Avoid legal complaints	Receive a high number of bids	Ensure a high quality purchase	Support local firms	Ensure a low price
Most important	○	○	○	○	○	○
Least important	○	○	○	○	○	○

Next

◄ back

Heterogeneity by career incentives

Responses by position

Price
- much lower than I expected
- a bit lower than I expected
- what I expected
- a bit higher than I expected
- much higher than I expected

Quality
- as I expected
- a bit better than I expected
- much better than I expected

Competition
- 1 bid
- 2 bids
- 4 bids
- 8 bids

Familiarity
- a firm I know and trust
- a firm unknown to me
- a firm that I had bad experiences with

Locality
- a local bidder from my region
- a non-local bidder not from my region

Litigation
- no
- yes

- ○ No managerial responsibility
- □ Managerial responsibility

Discretion

How much can you influence purchasing decisions

Resources

Workload allowed to do job properly

Incentives

Are tender outcomes important for career prospects?

Follow up question I results

Which factor is most important for your career prospects
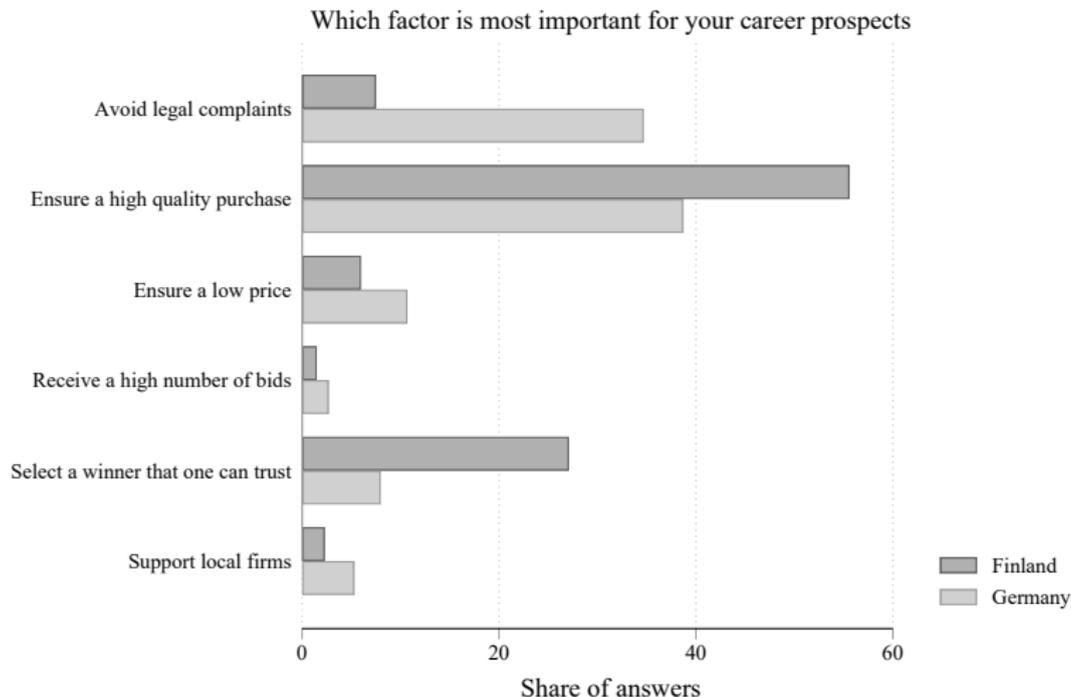
Follow up question II results

Goals actively pursued in daily work
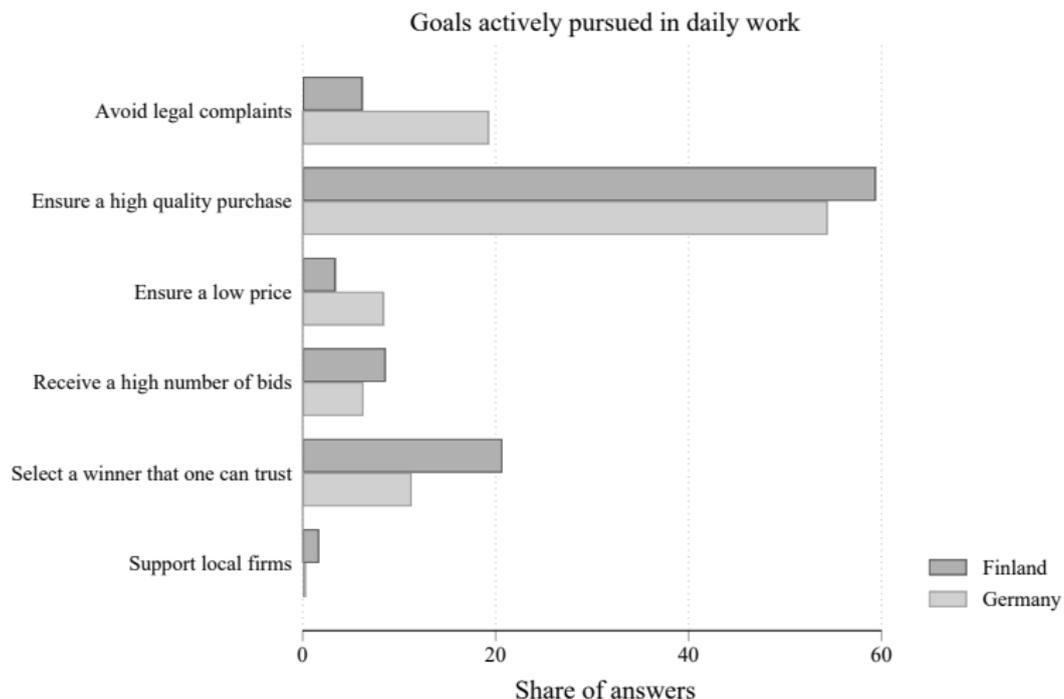
Follow up question III results

Most important factor for a desirable tender outcome

Avoid legal complaints

Ensure a high quality purchase

Ensure a low price

Receive a high number of bids

Select a winner that one can trust

Support local firms

Share of answers

Finland
Germany