Distortion by Audit

Evidence from Public Procurement

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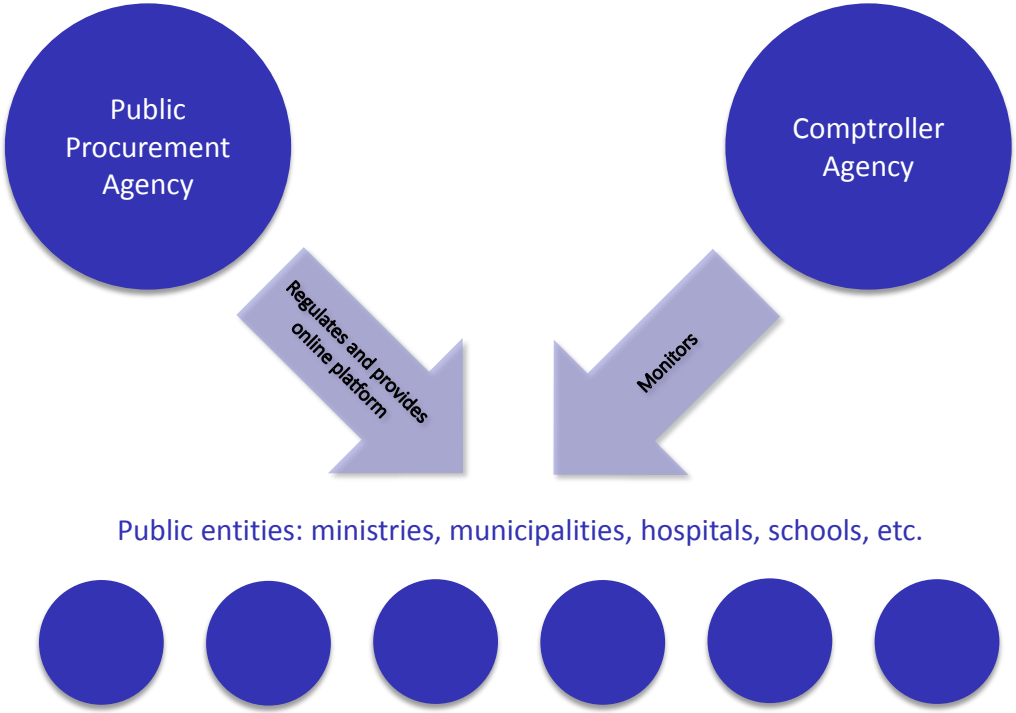
Online Appendix

A Appendix Figures and Tables

Figure A1:
Institutions in the Chilean Public Procurement Process



Notes: This figure shows the public entities involved in the procurement process. The Public Procurement Agency "ChileCompra" regulates the procurement process and provides the online platform. The Comptroller Agency "Contraloría" implements audits and other monitoring functions of all public entities. Public procurement is implemented by entities from small schools or hospitals to entire ministries.

Figure A2:
Timeline

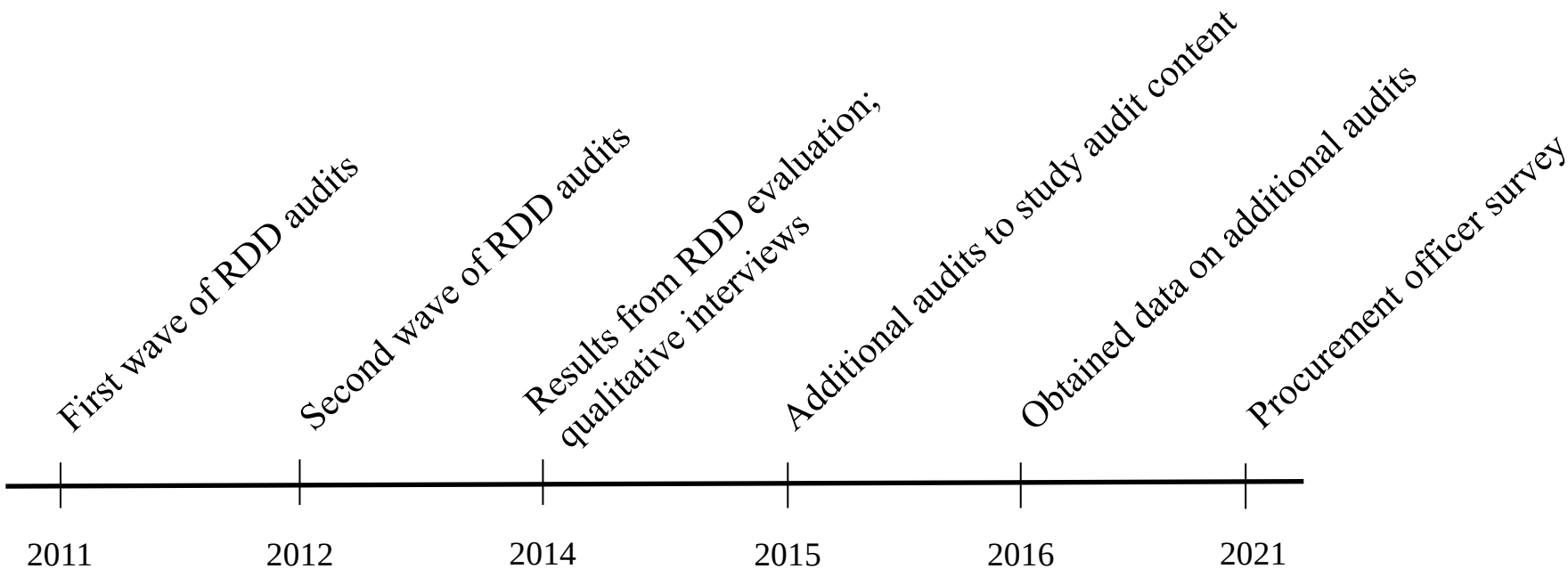
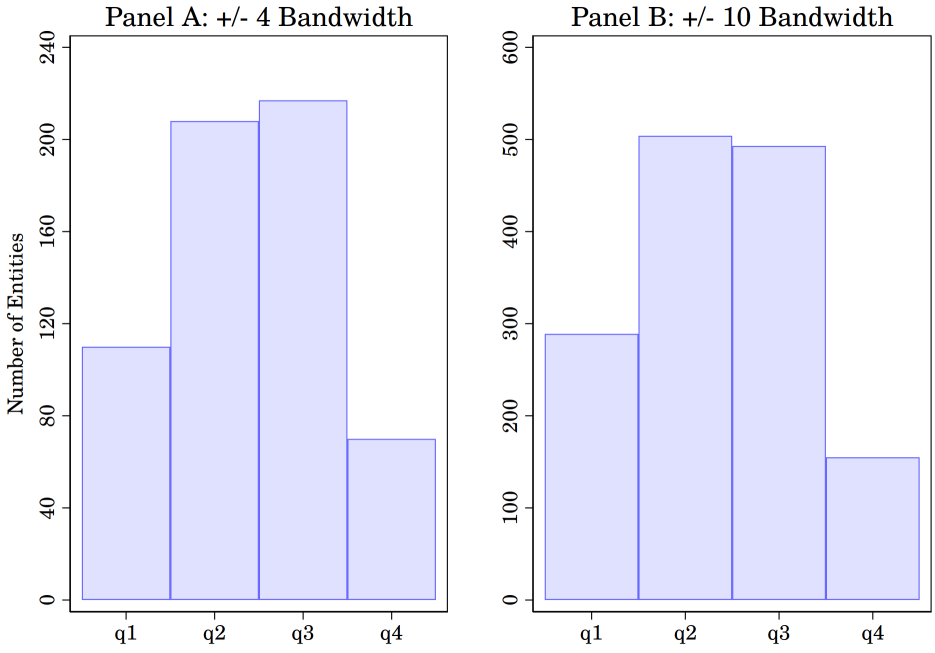
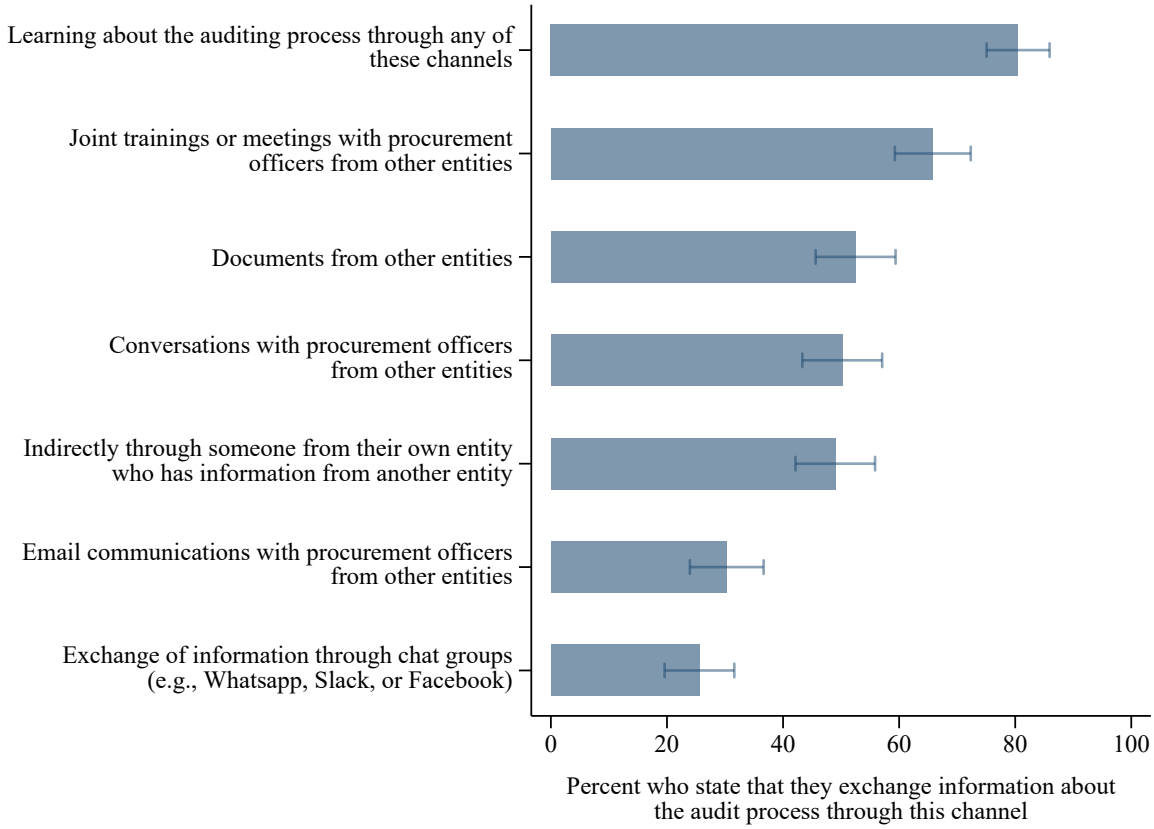


Figure A3: Number of Entities Under Audit by Quarter in Year t



Notes: This figure plots the number of entities under audit by quarter in year t (combining 2011 and 2012). Sample: medium risk entities in the ± 4 bandwidth and ± 10 range, respectively.

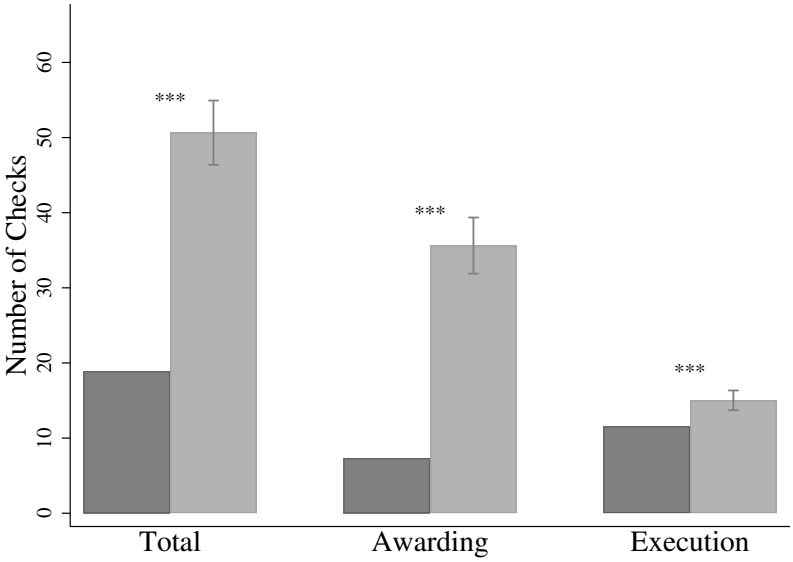
Figure A4:
Channels of Information Dissemination About the Auditing Process Between Public Entities



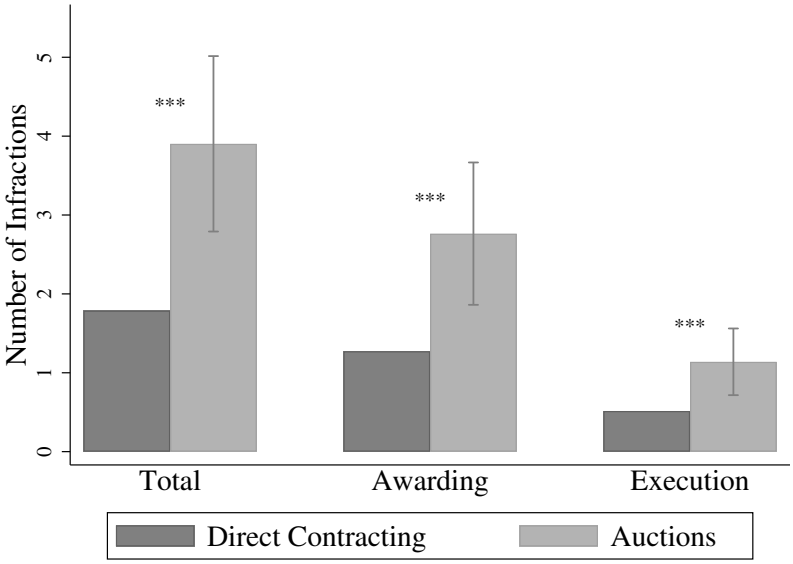
Notes: Survey responses on whether and how procurement officers exchange information about the auditing process with officers from other public entities. The figure shows the percentage who learned about the auditing process through a given channel (or any channel) with 95% confidence intervals.

Figure A5: Additional Audits: Checks and Infractions by Purchase Procedure Without Control Variables

Panel A: Checks

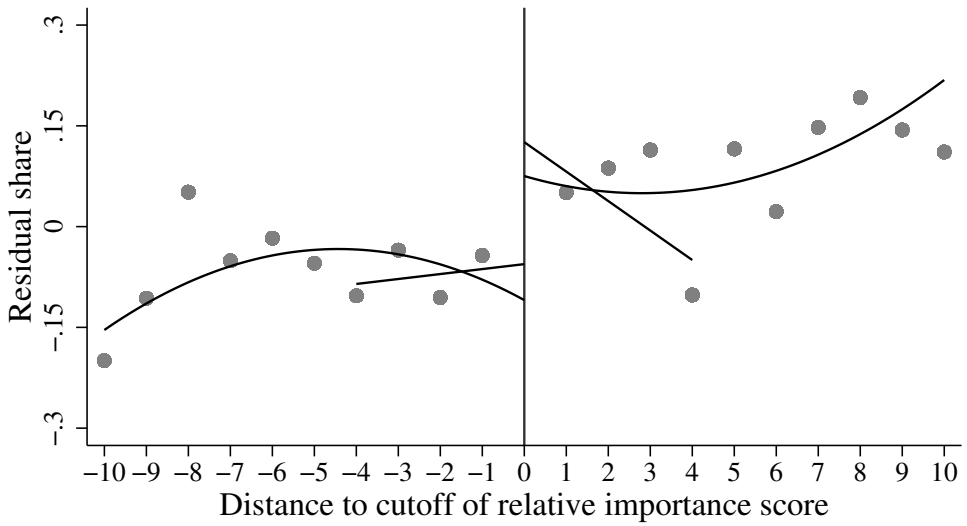


Panel B: Detected Infractions



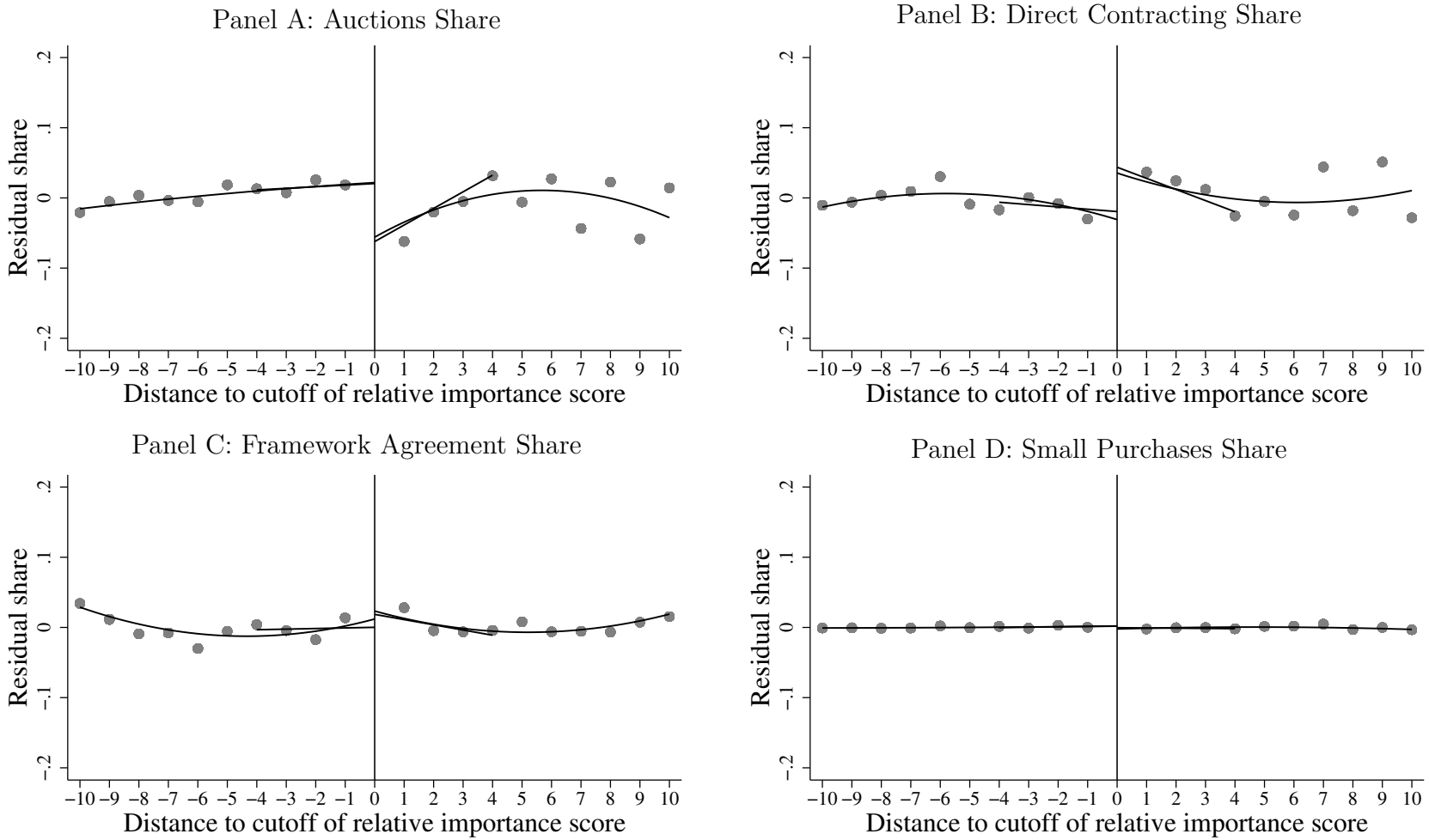
Notes: Panel A shows the number of checks per audited contract and Panel B shows the number of detected infractions. The left-hand set of bars displays the total number, the center bars show the number in the awarding stage, and the right-hand bars show the execution stage. The dark gray bars indicate mean numbers for direct contracts. The light gray bars show expected outcomes for auctions based on OLS regressions of the outcome on an auction dummy (as in Table A12 Panel A). The 95% confidence interval is based on the standard error of this adjusted difference estimate. Standard errors are clustered at the entity level. Figure 5 plots the same analysis with controls.

Figure A6:
Residual Share of Audited Entities (First Stage, One-Point Bins)



Notes: This figure shows the share of audited entities with medium level of risk in the ±10 range of the importance score for the years 2011 and 2012. The dots represent residual audit probabilities averaged within 1-point-wide intervals of the importance score. The residuals are obtained from a regression of the dummy for having been audited in a given year on stratum fixed effects and control variables. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased, and of auction and direct contract shares. Importance scores are normalized by stratum-level cutoff. A stratum refers to a cell defined by year and internal unit. Solid lines show linear and quadratic fits. Figure 2 shows the same with 2-point-wide intervals.

Figure A7:
Share of Spending by Purchase Procedure (One-Point Bins)



Notes: This figure shows the value of purchases made through auctions (Panel A), direct contracting (Panel B), framework agreement (Panel C) and small purchases (Panel D), as a share of total procurement spending by a given entity with medium level of risk in the ±10 range of the importance score threshold for the years 2011 and 2012. The dots represent residual procedure shares averaged within 1-point-wide intervals of the importance score. The residuals are obtained from a regression of the outcome in a given year on stratum fixed effects and control variables. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased, of auction and direct contract shares, and of the outcome variable (where different). The importance score for each entity is normalized by the stratum-level cutoff. A stratum refers to a cell defined by year and internal unit. Solid lines show linear and quadratic fits. Figure 3 shows the same with 2-point-wide intervals.

Table A1:
Impact on the Share of Audited Entities (First Stage), Pooling Across All Four Potential Cutoffs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Audit Probability							
1{Relative importance $\geq$ cutoff}	0.159***	0.107*	0.103*	0.162**	0.114	0.119*	0.079*	0.087*
	(0.058)	(0.061)	(0.056)	(0.074)	(0.072)	(0.066)	(0.042)	(0.050)
Bandwidth	±4	±4	±4	±10	±10	±10	±7.29	±7.29
Observations	872	872	859	2,040	2,040	2,014	1,525	1,525
R-squared	0.014	0.169	0.292	0.030	0.170	0.289	0.288	0.288
Comparison mean	0.205	0.205	0.205	0.181	0.181	0.181	0.224	0.224
Local polynomial	Linear	Linear	Linear	Quadr.	Quadr.	Quadr.	Linear	Linear
Stratum fixed effects	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Additional controls	No	No	Yes	No	No	Yes	Yes	Yes

Notes: RDD estimates following the specification of Equation (1). Columns (1) to (3) show estimations for the ±4 bandwidth and Columns (4) to (6) for the ±10 bandwidth with varying number of control variables. Columns (7) and (8) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012). Column (8) in addition reports bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased, and of auction and direct contract shares. Standard errors are clustered at the level of the strata. A stratum refers to a cell defined by year, internal unit and type of entity. Table 3 presents first stage results pooling across 2011 and 2012. ***p<0.01, **p<0.05, *p<0.1

Table A2:
Share of Spending Through Auctions and Direct Contracts
Interacting the Running Variable with Stratum Dummies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: Auctions				
1{Relative importance ≥ cutoff}	-0.065	−0.092**	−0.089***	−0.081**	−0.110***	−0.083***	−0.086***	−0.095***
	(0.045)	(0.045)	(0.033)	(0.038)	(0.037)	(0.029)	(0.028)	(0.034)
Bandwidth	±4	±4	±4	±10	±10	±10	±5.16	±5.16
Observations	482	482	477	1,002	1,002	992	603	603
R-squared	0.030	0.456	0.675	0.016	0.329	0.628	0.630	0.630
Comparison mean	0.637	0.637	0.637	0.665	0.665	0.665	0.668	0.668
				Panel B: Direct Contracting				
1{Relative importance ≥ cutoff}	0.087***	0.081**	0.056**	0.097***	0.093**	0.062**	0.064***	0.072***
	(0.032)	(0.039)	(0.027)	(0.032)	(0.041)	(0.027)	(0.023)	(0.027)
Bandwidth	±4	±4	±4	±10	±10	±10	±5.30	±5.30
Observations	482	482	477	1,002	1,002	992	615	615
R-squared	0.043	0.367	0.604	0.017	0.183	0.576	0.575	0.575
Comparison mean	0.136	0.136	0.136	0.110	0.110	0.110	0.117	0.117
Local polynomial	Linear	Linear	Linear	Quadr.	Quadr.	Quadr.	Linear	Linear
Stratum fixed effects	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Additional controls	No	No	Yes	No	No	Yes	Yes	Yes

Notes: Reduced form RDD estimates following the specification of Equation (2) and additionally interacting each stratum dummy with the distance to the cutoff. Columns (1) to (3) show estimations for the ±4 bandwidth and Columns (4) to (6) for the ±10 bandwidth with varying number of control variables. Columns (7) and (8) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012). Column (8) in addition reports bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased and of auction and direct contract shares. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year, internal unit and type of entity. Table 4 presents the same results without interactions. ***p<0.01, **p<0.05, *p<0.1

Table A3:
Impact on Share of Spending Through Auctions and Direct Contracting
Pooling Across All Four Potential Cutoffs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: Auctions				
1{Relative importance ≥ cutoff}	-0.040	−0.072**	-0.041	-0.042	−0.082***	−0.037*	−0.038**	−0.041**
	(0.034)	(0.035)	(0.024)	(0.031)	(0.029)	(0.019)	(0.015)	(0.019)
Bandwidth	±4	±4	±4	±10	±10	±10	±8.32	±8.32
Observations	872	872	859	2,040	2,040	2,014	1,712	1,712
R-squared	0.011	0.305	0.628	0.008	0.241	0.591	0.597	0.597
Comparison mean	0.627	0.627	0.627	0.638	0.638	0.638	0.668	0.668
				Panel B: Direct Contracting				
1{Relative importance ≥ cutoff}	0.061**	0.057**	0.022	0.064***	0.068***	0.033*	0.032***	0.036**
	(0.025)	(0.028)	(0.021)	(0.023)	(0.025)	(0.017)	(0.012)	(0.015)
Bandwidth	±4	±4	±4	±10	±10	±10	±8.35	±8.35
Observations	872	872	859	2,040	2,040	2,014	1,715	1,715
R-squared	0.015	0.171	0.521	0.006	0.101	0.474	0.490	0.490
Comparison mean	0.142	0.142	0.142	0.131	0.131	0.131	0.129	0.129
Local polynomial	Linear	Linear	Linear	Quadr.	Quadr.	Quadr.	Linear	Linear
Stratum fixed effects	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Additional controls	No	No	Yes	No	No	Yes	Yes	Yes

Notes: Reduced form RDD estimates following the specification of Equation (2). Columns (1) to (3) show estimations for the ±4 bandwidth and Columns (4) to (6) for the ±10 bandwidth with varying number of control variables. Columns (7) and (8) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012). Column (8) in addition reports bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased and of auction and direct contract shares. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year, internal unit and type of entity. Interaction between stratum and distance to the cutoff is included. Table 4 presents the same results for 2011 and 2012. ***p<0.01, **p<0.05, *p<0.1

Table A4:
Impact on Share of Spending Through Auctions and Direct Contracting, First Differences

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: Auctions				
1{Relative importance ≥ cutoff}	−0.062*	-0.049	−0.069**	-0.046	−0.056*	−0.085***	−0.079***	−0.089**
	(0.036)	(0.035)	(0.032)	(0.032)	(0.032)	(0.027)	(0.030)	(0.036)
Bandwidth	±4	±4	±4	±10	±10	±10	±5.19	±5.19
Observations	480	480	477	998	998	992	604	604
R-squared	0.013	0.219	0.440	0.009	0.148	0.364	0.377	0.377
Comparison mean change	-0.018	-0.018	-0.018	-0.030	-0.030	-0.030	-0.025	-0.025
				Panel B: Direct Contracting				
1{Relative importance ≥ cutoff}	0.041	0.042	0.061**	0.047*	0.046*	0.073***	0.069***	0.077***
	(0.029)	(0.030)	(0.028)	(0.027)	(0.026)	(0.025)	(0.024)	(0.028)
Bandwidth	±4	±4	±4	±10	±10	±10	±5.05	±5.05
Observations	480	480	477	998	998	992	593	593
R-squared	0.008	0.258	0.425	0.009	0.145	0.341	0.404	0.404
Comparison mean change	-0.010	-0.010	-0.010	-0.013	-0.013	-0.013	-0.006	-0.006
Local polynomial	Linear	Linear	Linear	Quadr.	Quadr.	Quadr.	Linear	Linear
Stratum fixed effects	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Additional controls	No	No	Yes	No	No	Yes	Yes	Yes

Notes: Reduced form RDD estimates following the specification of Equation (2). The outcome variable is the first difference of the share of spending through a purchase procedure. Columns (1) to (3) show estimations for the ±4 bandwidth and Columns (4) to (6) for the ±10 bandwidth with varying number of control variables. Columns (7) and (8) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012). Column (8) in addition reports bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased, and of auction and direct contract shares. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. Table 4 presents the same results but without taking the first difference. ***p<0.01, **p<0.05, *p<0.1

Table A5:
Impact on Share of Spending through Auctions and Direct Contracting, Year 2

	(1)	(2)	(3)	(4)
		Panel A: Auctions		
1{Relative importance ≥ cutoff}	-0.039	-0.050	-0.044	-0.055
	(0.039)	(0.035)	(0.031)	(0.037)
Bandwidth	±4	±10	±5.48	±5.48
Observations	476	990	632	632
R-squared	0.544	0.495	0.478	0.478
Comparison mean	0.605	0.620	0.627	0.627
		Panel B: Direct Contracting		
1{Relative importance ≥ cutoff}	0.018	0.033	0.025	0.030
	(0.030)	(0.028)	(0.022)	(0.027)
Bandwidth	±4	±10	±6.25	±6.25
Observations	476	990	696	696
R-squared	0.514	0.433	0.451	0.451
Comparison mean	0.168	0.159	0.143	0.143
Local polynomial	Linear	Quadr.	Linear	Linear
Stratum fixed effects	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes

Notes: Reduced form RDD estimates following the specification of Equation (2). Column (1) shows estimation for the ±4 bandwidth and Column (2) for the ±10 bandwidth with varying number of control variables. Columns (3) and (4) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012). Column (4) in addition reports bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lag of log (+1) of total amount purchased. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. ***p<0.01, **p<0.05, *p<0.1

Table A6:
Impact on Share of Spending Through Direct Contracting by Justification

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Unique Supplier				Emergency			
1{Relative importance ≥ cutoff}	0.012	0.012	0.015*	0.018**	0.042**	0.049***	0.044**	0.049**
	(0.009)	(0.008)	(0.008)	(0.009)	(0.018)	(0.017)	(0.018)	(0.021)
R-squared	0.491	0.404	0.430	0.430	0.307	0.210	0.276	0.276
Comparison mean	0.025	0.026	0.027	0.027	0.014	0.008	0.014	0.014
Observations	477	992	553	553	477	992	535	535
Bandwidth	±4	±10	±4.69	±4.69	±4	±10	±4.51	±4.51
	Trust in Suppliers				Disproportionate Cost			
1{Relative importance ≥ cutoff}	-0.004	0.001	0.004	0.004	-0.001	-0.002	-0.001	-0.001
	(0.006)	(0.006)	(0.003)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)
R-squared	0.515	0.445	0.431	0.431	0.311	0.278	0.327	0.327
Comparison mean	0.014	0.012	0.012	0.012	0.003	0.004	0.003	0.003
Observations	477	992	967	967	477	992	843	843
Bandwidth	±4	±10	±9.50	±9.50	±4	±10	±7.95	±7.95
	Cost Less Than 750 USD				Other			
1{Relative importance ≥ cutoff}	0.001	-0.004	-0.004	-0.005	0.008	0.021	0.015	0.017
	(0.005)	(0.004)	(0.004)	(0.005)	(0.017)	(0.018)	(0.016)	(0.019)
R-squared	0.649	0.544	0.648	0.648	0.682	0.563	0.621	0.621
Comparison mean	0.017	0.015	0.017	0.017	0.062	0.045	0.044	0.044
Observations	477	992	472	472	477	992	730	730
Bandwidth	±4	±10	±3.96	±3.96	±4	±10	±6.66	±6.66
Local polynomial	Linear	Quadr.	Linear	Linear	Linear	Quadr.	Linear	Linear
Stratum fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Reduced form RDD estimates following the specification of Equation (2). Columns (1) and (5) show estimations for the ±4 bandwidth and Columns (2) and (6) for the ±10 bandwidth. Columns (3), (4), (7) and (8) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012). Columns (4) and (8) in addition report bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased, of auction and direct contract shares, and of the outcome variable. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. ***p<0.01, **p<0.05, *p<0.1

Table A7:
Impact on Log of Total Amount Purchased

	(1)	(2)	(3)	(4)
1{Relative importance $\geq$ cutoff}	-0.106	-0.033	-0.009	-0.002
	(0.134)	(0.109)	(0.062)	(0.076)
Bandwidth	± 4	± 10	± 10.45	± 10.45
Observations	477	992	1,019	1,019
R-squared	0.923	0.912	0.913	0.913
Comparison mean	13.667	13.522	13.856	13.856
Local polynomial	Linear	Quadratic	Linear	Linear
Stratum fixed effects	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes

Notes: Reduced form RDD estimates of log (+1) of the annual amount purchased by the public entity following the specification of Equation (2). Column (1) shows estimations for the ± 4 bandwidth and Column (2) for the ± 10 bandwidth. Columns (3) and (4) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012). Column (4) in addition reports bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased, and of auction and direct contract shares. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year, internal unit and type of entity. ***p<0.01, **p<0.05, *p<0.1

Table A8:
Impact on Share of Spending Through Auctions and Direct Contracting by Size of Purchase

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: Auctions							
	Below Mean Contract Amount				Above Mean Contract Amount			
1{Relative importance ≥ cutoff}	-0.001	-0.003	0.000	-0.004	−0.061*	−0.076***	−0.073***	−0.095**
	(0.005)	(0.004)	(0.004)	(0.004)	(0.033)	(0.027)	(0.028)	(0.045)
Comparison mean	0.071	0.079	0.077	0.077	0.566	0.586	0.589	0.589
Bandwidth	±4	±10	±5.19	±5.19	±4	±10	±5.19	±5.19
Observations	477	992	604	604	477	992	604	604
	Panel B: Direct Contracting							
	Below Mean Contract Amount				Above Mean Contract Amount			
1{Relative importance ≥ cutoff}	0.003	0.001	0.001	0.002	0.056**	0.071***	0.063***	0.073**
	(0.005)	(0.004)	(0.004)	(0.004)	(0.027)	(0.025)	(0.023)	(0.037)
Comparison mean	0.024	0.023	0.024	0.024	0.112	0.088	0.101	0.101
Bandwidth	±4	±10	±5.05	±5.05	±4	±10	±5.05	±5.05
Observations	477	992	593	593	477	992	593	593
Local polynomial	Linear	Quadr.	Linear	Linear	Linear.	Quadr.	Linear	Linear
Stratum fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Reduced form RDD estimates following the specification of Equation (2). Panel A shows small vs. large purchases made through auctions (contract amount below vs. above the mean amount of all purchases by entity). Panel B shows the same for direct contracting. Columns (1) and (5) show estimation for the ±4 bandwidth and Columns (2) and (6) for the ±10 bandwidth. Columns (3), (4), (7) and (8) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012) for all purchase sizes combined (as in Table 4) so that it is constant for a given procedure. Columns (4) and (8) in addition report bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased, of auction and direct contract shares, and of the outcome variable. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. ***p<0.01, **p<0.05, *p<0.1

Table A9:
Impact on Share of Spending Through Auctions and Direct Contracting
by Number of Competitors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: Auction with Bidders > 3				Panel B: Direct Contracting with 1 Quote			
1{Relative importance ≥ cutoff}	-0.051	-0.052	−0.073**	−0.084**	0.052*	0.061**	0.050**	0.058**
	(0.036)	(0.032)	(0.031)	(0.035)	(0.031)	(0.028)	(0.024)	(0.028)
R-squared	0.413	0.370	0.388	0.388	0.462	0.441	0.406	0.406
Comparison mean	0.319	0.326	0.322	0.322	0.106	0.089	0.097	0.097
Observations	475	989	548	548	475	989	601	601
Bandwidth	±4	±10	±4.65	±4.65	±4	±10	±5.15	±5.15
	Panel C: Auction with Bidders ≤ 3				Panel D: Direct Contracting with 3 Quotes			
1{Relative importance ≥ cutoff}	-0.044	-0.039	-0.028	-0.031	-0.005	-0.007	-0.002	-0.003
	(0.046)	(0.043)	(0.026)	(0.031)	(0.004)	(0.005)	(0.005)	(0.006)
R-squared	0.471	0.399	0.401	0.401	0.626	0.398	0.412	0.412
Comparison mean	0.340	0.354	0.381	0.381	0.020	0.016	0.016	0.016
Observations	475	989	960	960	475	989	587	587
Bandwidth	±4	±10	±9.47	±9.47	±4	±10	±5.00	±5.00
Local polynomial	Linear	Quadr.	Linear	Linear	Linear	Quadr.	Linear	Linear
Stratum fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Reduced form RDD estimates following the specification of Equation (2). Panels A to D show the impact on the share of spending through auctions with > 3 bidders, direct contracts that require only 1 quote, auctions with ≤ 3 bidders and direct contracts that require 3 quotes, respectively. Columns (1) and (5) show estimations for the ±4 bandwidth and Columns (2) and (6) for the ±10 bandwidth Columns (3), (4), (7) and (8) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012). Columns (4) and (8) in addition report bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased, of auction and direct contract shares, and of the outcome variable. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. ***p<0.01, **p<0.05, *p<0.1

Table A10:
Probability That the Supplier Is From Out-of-Region,
Including Entities in the Metropolitan Region

	(1)	(2)	(3)	(4)
1{Relative importance $\geq$ cutoff}	-0.026	-0.016	-0.022	-0.032
	(0.019)	(0.018)	(0.022)	(0.027)
Bandwidth	± 4	± 10	± 3.90	± 3.90
Observations	1,141,996	2,442,604	1,126,069	1,126,069
R-squared	0.468	0.447	0.469	0.469
Comparison mean	0.407	0.422	0.401	0.401
Local polynomial	Linear	Quadratic	Linear	Linear
Stratum fixed effects	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes

Notes: Reduced form RDD estimates following the specification of Equation (2). Each observation corresponds to a purchase. Results show impacts on the probability that the supplier has not sold to this entity in the preceding four years (Panel A), is a large firm (Panel B), or is from another region (Panel C) (not excluding the Metropolitan Region). Column (1) shows estimates for the ± 4 bandwidth and Column (2) for the ± 10 bandwidth. Columns (3) and (4) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012). Column (4) in addition reports bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, first and second lags of log (+1) of total amount purchased, and of auction and direct contract shares, as well as month and product-unit fixed effects. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. Table 6 shows the same analysis without entities in the Metropolitan Region. ***p<0.01, **p<0.05, *p<0.1

Table A11:
Impact on the Log of Unit Prices

	(1)	(2)	(3)	(4)
1{Relative importance ≥ cutoff}	0.071	0.126*	0.062*	0.088*
	(0.084)	(0.074)	(0.037)	(0.049)
Bandwidth	±4	±10	±4.93	±4.93
Observations	27,671	54,899	35,381	35,381
R-squared	0.792	0.770	0.813	0.813
Comparison mean	0.374	0.401	0.504	0.504
Local polynomial	Linear	Quadratic	Linear	Linear
Stratum fixed effects	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes

Notes: Reduced form RDD estimates following the specification of Equation (2). Each observation corresponds to a purchase. Sample includes products with clear and comparable units and a sizeable shift in purchase procedure. Column (1) shows estimations for the ±4 bandwidth and Column (2) for the ±10 bandwidth. Columns (3) and (4) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012). Column (4) in addition reports bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, first and second lags of log (+1) of total amount purchased, and of auction and direct contract shares, as well as month and product-unit fixed effects. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. Table 7 shows the same analysis using entities in the ±4 bandwidth. ***p<0.01, **p<0.05, *p<0.1

Table A12:
Additional Audits: Checks and Infractions by Purchase Procedure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Checks			Infractions			Follow-Up Investigation
	Total	Awarding	Execution	Total	Awarding	Execution	
	Panel A: Without Control Variables						
Auction	31.74***	28.29***	3.45***	2.11***	1.49***	0.62***	0.09*
	(2.18)	(1.90)	(0.67)	(0.57)	(0.46)	(0.22)	(0.05)
Constant	18.91***	7.33***	11.58***	1.79***	1.27***	0.52***	0.12
	(1.36)	(1.32)	(0.50)	(0.49)	(0.42)	(0.16)	(0.07)
Observations	105	105	105	105	105	105	105
R-squared	0.692	0.757	0.166	0.076	0.056	0.066	0.011
	Panel B: With Control Variables						
Auction	31.66***	28.54***	3.12***	2.70**	2.24**	0.45	0.12
	(2.18)	(1.70)	(0.94)	(1.11)	(0.83)	(0.39)	(0.07)
Amount of purchase	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product code	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month of purchase	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control department	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Audit in September	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	104	104	104	104	104	104	104
R-squared	0.922	0.933	0.692	0.701	0.748	0.463	0.648

Notes: OLS estimations. Each observation is an audited purchase. The constant term captures the mean for direct contracts and the coefficient on "auction" measures the difference to direct contracts. Column (1) shows the total number of checks conducted. Columns (2) and (3) show the number of checks in the awarding and execution stages of the purchase, respectively. Column (4) shows the total number of infractions detected. Columns (5) and (6) show the number of infractions in the awarding and execution stages. Column (7) shows the probability of a formal follow-up investigation for serious infractions to determine individual responsibilities and sanctions. Panel B has one less observation since control variables were missing for that purchase. Standard errors are clustered at the entity level. ***p<0.01, **p<0.05, *p<0.1

Table A13:
Impact on the Share of Audited Entities in the Subsequent Year

	(1)	(2)	(3)	(4)
	Probability of Audit in Year 2			
1{Relative importance $\geq$ cutoff}	0.039	0.062	0.085	0.076
	(0.120)	(0.109)	(0.068)	(0.085)
Bandwidth	± 4	± 10	± 8.86	± 8.86
Observations	477	992	915	915
R-squared	0.381	0.275	0.288	0.288
Comparison mean	0.162	0.161	0.191	0.191
Local polynomial	Linear	Quadratic	Linear	Linear
Stratum fixed effects	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes

Notes: RDD estimates following the specification of Equation (1). Column (1) shows estimation for the ± 4 bandwidth and Column (4) for the ± 10 bandwidth. Columns (3) and (4) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012). Column (4) in addition reports bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased, and of auction and direct contract shares. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. ***p<0.01, **p<0.05, *p<0.1

B Audit Protocol

Goal	Specific audit check	Stage
Auctions		
1) Auction Call	1. Verify the existence of the mayoral (municipality) decree or resolution that approves the auction call.	Awarding
	2. Check the publication of the auction in the ChileCompra system.	Awarding
	3. Verify the existence of technical and administrative tender documents.	Awarding
	4. Verify that the tender documents are approved by mayoral decree or resolution.	Awarding
2) Verify that the call contains the minimums established in article 24 of Regulation No. 250	Verify that the call has at least:	
	1. Description of the good or service.	Awarding
	2. Name of the contracting entity.	Awarding
	3. Modalities and dates for the clarification of tender documents.	Awarding
	4. Date and time of receipt and opening of bids.	Awarding
	5. Amount and type of required guarantees.	Awarding
	6. Full name and email of the officer in charge of the procurement process.	Awarding
3) Verify that the bases contain at least the aspects referred to in article 20 and 22 of Regulation No. 250	Verify that the bases establish at least:	
	1. The requirements and conditions to be met by bidders.	Awarding
	2. The generic specification of goods or services to be procured.	Awarding
	3. The stages and deadlines for bidding and contracting.	Awarding
	4. The conditions, time and way of payment of the good or service contracted.	Awarding
	5. The deadline for the delivery of the good or service.	Awarding
	6. The nature and amount of guarantees, as well as how and when they will be restored.	Awarding
	7. The means to establish whether the supplier has outstanding balances with employees and dates by which they will be requested.	Awarding
	8. The designation of the evaluation committee.	Awarding
4) Analyze the tender documents and check whether they favor a given provider	Evaluate the tender documents and verify that they do not contain any features that favor a given provider, such as: technical conditions that only one provider can accomplish or tailored evaluation criteria.	Awarding
5) Presentation of the bids	Verify that the submission of bids is done according to what is stated in the tender document:	
	1. That they contain all the required documents, such as technical and administrative bids.	Awarding
	2. Validate the guarantee of seriousness of the offer in terms of amount, dates and validity.	Awarding
	3. That bid was presented within the deadline established.	Awarding
	4. That they are available in the ChileCompra system.	Awarding
6) Bid opening report and evaluation of bids	1. Verify that the following is accomplished:	
	a. Existence of a bid opening report.	Awarding
	b. Bid opening report is signed by the evaluation committee.	Awarding
	c. Verify that the deadlines (date and time) for the opening of technical bids as stipulated in the tender documents are met.	Awarding
	d. Verify that the deadlines (date and time) for the opening of economic bids as stipulated in the tender documents are met.	Awarding
	2. Check the following:	

	a. The existence of an evaluation report of the bids.	Awarding
	b. Check in the evaluation report that the designation of members of the evaluation committee is done according to the tender document.	Awarding
	c. Check that the evaluation report is endorsed by all the members of the committee.	Awarding
	3. Validate that the criteria used for selecting the winning bid are consistent with the tender document.	Awarding
	4. Verify that the awarded provider presents the best offer according to the parameters set out in the tender document.	Awarding
7) Committee for auctions greater than 1,000 UTM	1. Verify the existence of a committee for auctions higher than 1,000 UTM.	Awarding
	2. Verify that the administration has a mechanism for verifying that members of the evaluation committee do not present conflicts of interest.	Awarding
	3. Verify that the administration evaluates the financial situation and technical suitability of hired committee members.	Awarding
	4. Check the suitability of the members of the evaluation committee in terms of their professional qualifications or position in relation to the nature of the tender.	Awarding
8) Verify the existence of the declaration of kinship of providers	1. Verify that the administration has a control mechanism to prevent people linked by kinship with senior officials of the entity to be hired.	Awarding
	2. Verify that the administration evaluates the financial position and technical expertise of hired personnel.	Awarding
	3. Verify that the administration has a procedure to verify that it has not hired people convicted for anti-union practices or for violating fundamental rights of workers.	Awarding
9) Awarding and contract signing	1. Verify the existence of an award decision duly signed by the committee.	Awarding
	2. Verify the existence of a mayoral decree or resolution that approves the award decision duly signed by the competent authority.	Awarding
	3. Verify that the award decision is published in the ChileCompra system.	Awarding
	4. Check that the contract is signed by the date specified in the tender documents.	Awarding
	5. Check that the contract is published in the ChileCompra system.	Awarding
	6. Verify that the contract is approved by a mayoral decree or resolution (if applicable).	Awarding
	7. Verify that the contract does not apply retroactively.	Awarding
10) Verify the correct emission of the purchase order	1. Corroborate that the purchase order has been issued after the resolution approving the contract.	Execution
	2. Corroborate that the purchase order matches its description with the requirements and provisions stipulated in the contract and/or tender documents.	Execution
11) Contract extension	Identify and analyze the pertinence of consecutive extensions of contract whose validity is extended indefinitely.	Execution

12) Verify the existence, custody, validity and accounting registry of performance guarantees	1. Verify the existence and corresponding custody of the performance guarantee. 2. Verify the following: a. Amount b. Name of beneficiary c. Emission date d. Validity e. Delivery 3. Verify that, when appropriate, the guarantee was actually used. 4. Corroborate that the performance guarantees are registered in the accounting system according to CGR regulation.	Execution Execution Execution Neither

Direct Contracting

13) Direct purchases of less than 3 UTM	1. Validate the respective quotation process. 2. Verify the emission of the corresponding purchase order. 3. Verify that the purchase order was issued after the resolution. 4. Check the emission of the corresponding resolution.	Awarding Execution Execution Awarding
14) Purchases or contracts exceeding 3 UTM and less than 100 UTM	1. Verify that the procurement process and contracts have been developed within the ChileCompra platform, except for cases under article 53 of the regulation. 2. Confirm that the reports, documents and resolutions are published. 3. Verify the resolution authorizing the direct contracting. 4. Verify the reasons for using this exceptional type of contract. 5. Check that the contracts have been formalized by the respective purchase order in accordance with article 63 of the regulation. 6. Verify that the purchase orders are issued prior to receiving the invoice. 7. Determine the existence of at least 3 quotations as required by article 51.	Awarding Awarding Awarding Awarding Execution Execution Awarding
15) Purchases or contracts higher than 100 UTM and lower than 1000 UTM	1. Determine that the procurement process and contracts have been developed within the ChileCompra platform, except for cases under article 53 of the regulation. 2. Confirm that the reports, documents and resolutions are published. 3. Verify sufficient accreditation of elements that allow for direct contracting. 4. Verify the existence of a resolution authorizing the direct contracting. 5. Verify that the resolution explains the reasons for resorting to direct contracting. 6. Check that the contract has been formalized by signature. 7. Determine the existence of at least 3 quotations as established in article 51.	Awarding Awarding Awarding Awarding Awarding Awarding Awarding

Overall Checks

16) Procurement plan	Verify the existence of a procurement plan and its publication: 1. Verify the existence of a purchasing plan. 2. Verify that the purchase plan has been approved and published.	 Neither Neither

	3. If there are changes to the plan, verify that they are published as well.	Neither
17) Review of the payment decrees or resolutions.	Validate the following: 1. Verify that the amounts paid correspond exactly to what was offered and contracted. 2. Confirm that the decrees or resolutions are duly endorsed by the corresponding authority. 3. Verify that the expense vouchers record date and signature of the person withdrawing the check. 4. Confirm that the payment decree authorizes the operation. 5. Check that the decrees or resolutions of payments have the relevant supporting documentation, including at least: purchase order, invoice, document issued by authorized officer certifying the correct reception of the good or service. 6. Verify that the payment in question corresponds to a pertinent expenditure. 7. Verify that the payments were made within the prescribed period, checking that there is no delay between the date of the invoice, its accounting and the respective payment.	Execution Execution Execution Execution Execution Execution Execution
18) The acquisition or provision of service should be according to the tender documents and the defined need.	1. Verify that goods and/or services correspond to the effectively auctioned and contracted (technical specifications). 2. Verify compliance with the terms of the contract. 3. Check if there are changes to the contracts and their adequate formalization. 4. Check, when applicable, whether penalties for late delivery of goods or services, partial delivery, technical specification or other (detailing "others") were applied. 5. Verify that the amount of penalties charged is according to what is established in the tender documents. 6. Verify that services are adequately provided.	Execution Execution Execution Execution Execution Execution
19) Control of purchased goods	1. Confirm that the goods acquired have been received. 2. Verify that the good acquired is registered in inventory. 3. Verify that the goods are in the respective departments and appropriately used.	Execution Execution Execution
20) Aspects of internal control	1. Existence of a regulation/purchasing procedures manual approved and published in the system. 2. Verify that users of the ChileCompra system are formally appointed. 3. Verify that documents are endorsed by those who are authorized (including delegation of signature). 4. Corroborate that the administration maintains adequate segregation of duties between the officials who are involved in the different stages of the procurement process.	Neither Neither Neither Neither

C Details on the Conceptual Framework

The following derives the conceptual framework introduced in Section II.D more formally. The framework illustrates the challenge of avoiding distortions by audit when agents subject to the audit have some discretion over multiple procedures. When agents learn that using the more complex procedure entails a higher risk of detecting infractions during an audit, agents have an incentive to avoid this procedure and use the shorter or simpler procedure, even if that procedure is not optimal otherwise.

Consider two such procedures, $j = \{1, 2\}$, that differ in the number of auditable steps in their execution. Reflecting the Chilean setting, the procedure with fewer steps is direct contracting, while the alternative procedure, i.e. auctions, is more complex. As discussed in Section II.D, many factors could affect agents' choice of procedure. In the following framework, we focus on the aspect that, at each step, agents run the risk of making a mistake leading to an infraction of the chosen procedure.

The agent's problem builds on the standard Becker deterrence model of crime (e.g. Becker, 1968). The probability ϵ of an infraction at each step k can be reduced by exerting additional effort to avoid mistakes. Thus, agents choose the level of effort to reduce the risk of making infractions while taking into account the effort cost and the expected penalty. At each step, infractions are detected with probability p_k. Agents receive sanction s per detected infraction.

The auditing agency attempts to deter infractions. If, as is often the case, the sanction is given by law and not a choice variable for the agency, deterrence will be maximized by maximizing the likelihood of detection p_k. The agency chooses which steps to audit and with what intensity. Define as n the total number of auditable steps executed by all agents across all procedures. The probability of detection $p_k = p(h_k)$ in a given step is increasing in audit hours h_k, $p'(h_k) > 0$. The agency's problem is then to maximize the likelihood of infraction detection $\sum_{k=1}^{n} p(h_k)\epsilon$, subject to a budget constraint $\sum_{k=1}^{n} h_k = B$, where B refers to the

total audit hours available across all agents and procedures. The n first order conditions are $p'(h_k^*)\epsilon = L$, where L is the Lagrange multiplier associated with the budget constraint.

If there are decreasing returns to auditing hours within a given step, then $p(h_k)$ is concave in auditing hours, $p''(h_k) < 0$. In this case, $h_k^* = B/n$ maximizes the detection probability: It is optimal for the auditing agency to investigate each auditable step with the same intensity. This may explain why the "auditing by checklist" approach is so common. If, on the other hand, $p(\cdot)$ is non-concave or if there is a fixed cost to auditing each step, then the objective function is maximized by selecting a subset of steps and auditing them fully. If the budget constraint is binding, such that not all steps can be audited, optimizing agencies will randomly select steps to be audited.

The following shows that this approach can mechanically lead to a higher expected penalty for procedures j involving more auditable steps. For the concave case, consider the expected number of discovered infractions per procedure, $E_j = n_j p(h_k^*)\epsilon$. The ratio of expected discovered infractions for two procedures is then

$$\frac{E_2}{E_1} = \frac{n_2 p(h_k^*)\epsilon}{n_1 p(h_k^*)\epsilon} = \frac{n_2}{n_1},$$

where $h_k^* = B/n$, and B and n refer to the total budget and total number of steps across all agents and procedures. n_2 and n_1 refer to the number of steps in procedures of type 2 and 1 respectively.

A similar result is obtained for the non-concave case, where every step has the same probability of being randomly selected for audit. So irrespective of whether there are increasing or decreasing returns to audit hours within a given step, procedures with more steps lead to a higher number of expected infractions and associated sanctions. If, for example, procedure 2 has twice the number of steps as procedure 1, the expected number of discovered infractions will be twice as high in procedure 2.

Eliminating this distortionary incentive would require equalizing the expected number of discovered infractions across the two procedures: $E_2 = E_1$. In the non-concave case,

auditors can achieve this simply by randomly sampling fewer steps of the longer procedure, such that the number of audited steps is equal across procedures. In the concave case, equalizing the expected number of discovered infractions requires increasing audit hours per auditable step in procedure 1 relative to procedure 2 such that

$$\frac{p(h_{k1})}{p(h_{k2})} = \frac{n_2}{n_1}.$$

Steps in the shorter procedure 1 are then audited more intensely than in the longer procedure 2. But given the decreasing returns to auditing intensity within a given step, the marginal detection likelihood is now lower in the shorter procedure $p'(h_{k1}) < p'(h_{k2})$ and this deviation from h_k^* fails to maximize the overall number of detected infractions. In the concave case, there is therefore a trade-off between removing the distortionary incentive and maximizing detection of infractions.[1]

Whether it is optimal to eliminate the distortion depends on several factors, including a) the extent to which the choice of procedure is affected by the differential number of detected infractions, and b) the social cost of distortions in the choice of procedure. In the case of procurement, a) relates to how strongly procurement officers shift from auctions to direct contracting when learning that the former leads to more detected infractions. The social costs b) of this distortion can include, for example, higher prices for public expenditures or higher barriers to entry for new firms.

[1]The extent of the distortion is mitigated or amplified depending on the relative likelihood of a mistake. The distortion would be mitigated or even reversed if $\epsilon_1 > \epsilon_2$. In this case the auditing agency would naturally want to increase monitoring of the shorter procedure, such that $p'(h_{k1}^*)\epsilon_1 = p'(h_{k2}^*)\epsilon_2$. With a concave detection probability, this would require increased audit hours in the shorter procedure, leading to an increased likelihood of detection in a given step, compared to the longer procedure $p(h_2)/p(h_1) < 1$.

D Additional Robustness Checks on Product Choice

This appendix shows two robustness checks regarding the alternative explanation that the impact on purchase procedures might be driven by a change in products.

1. Did Audits Lead to a Change in the Type of Products Purchased?

First, we analyze the results for spending shares for each of the 6 main product groups, and then we proceed to more disaggregated analysis, at the 2-digit and 8-digit product codes. Appendix Table D3 below shows the impact of being above the RDD cutoff on the share of spending by a given entity on each of the six main UN product categories.[2] All point estimates are close to zero and there is no statistically significant change in the share of spending made on any of the six categories. Further, F-tests of joint significance across all categories have p-values of 0.99 for the linear and 0.97 for the quadratic specifications, respectively, indicating that the audits had no impact on these product categories. Table D4 shows the further disaggregated analysis at the 2-digit product codes. Again, the results indicate no systematic change in spending composition. Most point estimates are small, and out of 220 point estimates, only 12 are statistically significant at 5 percent, in line with what would be expected due to random chance. F-tests of joint significance have p-values of 0.21 and 0.78 for the linear and quadratic specification respectively.

Finally, we test whether there are shifts at the most disaggregated — 8-digit — product level within each 2-digit category. We restrict the product space to those products that are bought by a minimum of 100 entities and conduct robustness checks with a minimum of 80 and 120 entities.[3] For a minimum of 100 entities there are 43 2-digit product groups. At the 5%-level, F-tests are significant for 3 products in the linear and 3 products in the quadratic specification, again close to what one would expect purely by chance. Results are similar for 80 and 120 minimum number of entities per product.[4]

[2]We use the five UNSPSC highest-level product classifications and disaggregate services further into construction and non-construction.

[3]A restriction is necessary because many 8-digit products are only bought by a very small number of entities in a given year, leading to very low degrees of freedom.

[4]More precisely, with a minimum of 120 entities 3 out of 39 (linear) and 2 out of 39 (quadratic) are significant, and with a minimum of 80 entities 4 out of 46 (linear) and 2 out of 46 (quadratic).

2. Restricting to Goods with a Meaningful Choice of Procurement Procedure

Next, we test the robustness of our main results using a subset of products which have a meaningful choice of purchase procedure, i.e. where not almost all of the purchases of this product are made through one procedure. Table D5 below show these results for three sets of products, excluding those products with the least procedure choice. The first set excludes the products with the smallest procedure shares such that the removed products account for 10% of total spending for entities at the cutoff on average. The second and third set excludes products with the least procedure choice representing 20% and 30% of total spending, respectively.[5] As the new Table D5 below shows, the impact on purchase procedure shares remains very similar among these products.

[5]The included products, respectively for the three subsets, have auction or direct contracting shares less than 97%, 93%, and 90%.

Table D1:
Expected Impact on Share of Spending Through Auctions and Direct Contracting Based on Products' Pre-Treatment Purchase Procedure Shares

	(1)	(2)	(3)	(4)
		Panel A: Auctions		
1{Relative importance ≥ cutoff}	-0.012	0.001	0.004	0.002
	(0.031)	(0.027)	(0.016)	(0.020)
Bandwidth	±4	±10	±8.05	±8.05
Observations	477	992	853	853
R-squared	0.012	0.423	0.398	0.398
Comparison mean	0.545	0.551	0.567	0.567
		Panel B: Direct Contracting		
1{Relative importance ≥ cutoff}	0.000	0.006	0.009	0.009
	(0.011)	(0.010)	(0.007)	(0.009)
Bandwidth	±4	±10	±6.98	±6.98
Observations	477	992	755	755
R-squared	0.247	0.214	0.197	0.197
Comparison mean	0.165	0.161	0.162	0.162
Local polynomial	Linear	Quadr.	Linear	Linear
Stratum fixed effects	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes

Notes: This table tests the alternative explanation that the shift from auctions to the use of more direct contracting is driven by a change in the product mix. It consists of reduced form RDD estimates following the specification of Equation (2), where the outcome variable is the expected share of spending under the actual (potentially shifted) product mix but using product-level procedure shares that are constant based on year $t-1$. For details, see Subsection on Product Choice. Column (1) shows estimations for the ±4 bandwidth and column (2) for the ±10 bandwidth. Columns (3) and (4) employ the mean-squared-error-optimal bandwidth following Imbens and Kalyanaram (2012). Column (4) in addition reports bias-corrected estimates and robust standard errors following Calonico, Cattaneo and Titiunik (2014). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years), political affiliation, as well as first and second lags of $log(+1)$ of total amount purchased, and of auction and direct contract shares. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. ***p<0.01, **p<0.05, *p<0.1

Table D2:
Impact on Product-Level Share of Spending Through Auctions and Direct Contracting with Varying Granularity of Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Panel A: Auctions			
1{Relative importance ≥ cutoff}	-0.060	-0.064	−0.067*	−0.072**	−0.076**	−0.079**	−0.076**
	(0.051)	(0.040)	(0.039)	(0.036)	(0.036)	(0.035)	(0.033)
Bandwidth	±7.50	±5.92	±5.67	±5.36	±5.07	±4.92	±4.83
Observations	327,623	274,116	260,724	248,638	240,234	235,501	229,585
R-squared	0.002	0.103	0.121	0.262	0.310	0.394	0.462
Comparison mean	0.667	0.655	0.648	0.649	0.642	0.631	0.627
				Panel B: Direct Contracting			
1{Relative importance ≥ cutoff}	0.092**	0.070**	0.069**	0.072**	0.062**	0.060**	0.064**
	(0.039)	(0.032)	(0.030)	(0.031)	(0.030)	(0.030)	(0.029)
Bandwidth	±6.48	±5.48	±5.43	±5.22	±5.45	±5.26	±5.04
Observations	294,870	255,059	253,612	244,920	253,611	245,595	239,492
R-squared	0.005	0.096	0.120	0.165	0.203	0.275	0.313
Comparison mean	0.114	0.132	0.132	0.126	0.133	0.126	0.141
Local polynomial	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Stratum fixed effects	No	No	Yes	Yes	Yes	Yes	Yes
Additional controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Product fixed effects	No	No	No	2-digit	4-digit	6-digit	8-digit

Notes: Reduced form RDD estimates following the specification of Equation (2). The dependent variable is the share of spending through auctions/direct contracts, respectively, out of total spending on a given product by a given entity. All columns employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012) and report bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years), political affiliation, as well as first and second lags of $log(+1)$ of total amount purchased, and of auction and direct contract shares. Regressions are weighted using entity product shares. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. ***p<0.01, **p<0.05, *p<0.1

Table D3:
Impact on Share of Spending by Sector

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Raw Materials				Industrial Equipment			
1{Relative importance ≥ cutoff}	0.003	0.002	0.004	0.005	-0.002	0.010	0.011	0.013
	(0.013)	(0.012)	(0.010)	(0.013)	(0.016)	(0.015)	(0.012)	(0.015)
Bandwidth	±4	±10	±6.89	±6.89	±4	±10	±6.54	±6.54
R-squared	0.605	0.561	0.518	0.518	0.442	0.335	0.387	0.387
Comparison mean	0.090	0.097	0.105	0.105	0.064	0.060	0.061	0.061
Observations	477	992	746	746	477	992	718	718
	Equipment Components and Supplies				Manufactured Products			
1{Relative importance ≥ cutoff}	-0.006	0.005	-0.001	0.001	0.006	0.004	0.001	-0.002
	(0.022)	(0.020)	(0.011)	(0.013)	(0.025)	(0.022)	(0.017)	(0.021)
Bandwidth	±4	±10	±9.37	±9.37	±4	±10	±5.97	±5.97
R-squared	0.459	0.380	0.378	0.378	0.724	0.705	0.735	0.735
Comparison mean	0.087	0.092	0.096	0.096	0.307	0.314	0.310	0.310
Observations	477	992	954	954	477	992	673	673
	Construction				Non-Construction Services			
1{Relative importance ≥ cutoff}	0.011	-0.003	0.001	0.006	-0.013	-0.011	-0.026	-0.034
	(0.034)	(0.029)	(0.022)	(0.026)	(0.031)	(0.025)	(0.024)	(0.028)
Bandwidth	±4	±10	±7.66	±7.66	±4	±10	±5.20	±5.20
R-squared	0.593	0.529	0.547	0.547	0.621	0.596	0.607	0.607
Comparison mean	0.102	0.102	0.124	0.124	0.350	0.336	0.328	0.328
Observations	477	992	810	810	477	992	604	604
Local polynomial	Linear	Quadr.	Linear	Linear	Linear	Quadr.	Linear	Linear
Stratum fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Reduced form RDD estimates following Equation (2). Columns (1) and (5) show estimations for the ±4 bandwidth and Columns (2) and (6) for the ±10 bandwidth. Columns (3), (4), (7) and (8) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012) (as in Table 4). Columns (4) and (8) report bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Panels show the share of spending by sector using the 6 sector grouping based on the UNSPSC Classification (2004). Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased, of auction and direct contract shares, and of the outcome variable. Standard errors clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. ***p<0.01, **p<0.05, *p<0.1

Table D4:
Impact on Share of Spending by 2-Digit Product Classification

	(1)	(2)	(3)	(4)	(5)
	Comparison mean (±4)	Linear estimate (±4)	Quadratic estimate (±10)	Linear estimate (optimal BW)	Linear estimate (optimal BW)
Live Plant and Animal Material and Accessories and Supplies	0.001	-0.000	0.000	0.000	0.000
		(0.001)	(0.000)	(0.000)	(0.000)
Mineral and Textile and Inedible Plant and Animal Materials	0.005	-0.004	-0.001	-0.001	-0.000
		(0.003)	(0.002)	(0.002)	(0.002)
Chemicals including Bio Chemicals and Gas Materials	0.007	-0.002	-0.000	-0.002	−0.002*
		(0.002)	(0.001)	(0.001)	(0.001)
Resin and Rosin and Rubber and Foam and Film and Elastomeric Materials	0.000	0.000	0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)
Paper Materials and Products	0.026	0.001	0.004	-0.000	0.000
		(0.005)	(0.005)	(0.004)	(0.005)
Fuels and Fuel Additives and Lubricants and Anti corrosive Materials	0.037	0.004	0.004	0.007	0.008
		(0.012)	(0.010)	(0.008)	(0.010)
Mining and Well Drilling Machinery and Accessories	0.002	0.006	0.005	0.006*	0.006*
		(0.004)	(0.003)	(0.003)	(0.004)
Farming and Fishing and Forestry and Wildlife Machinery and Accessories	0.000	0.001	-0.000	-0.000	-0.000
		(0.001)	(0.001)	(0.001)	(0.001)
Building and Construction Machinery and Accessories	0.005	−0.014**	-0.007	−0.013***	−0.015***
		(0.005)	(0.005)	(0.005)	(0.006)
Industrial Manufacturing and Processing Machinery and Accessories	0.002	0.001	0.001	0.001	0.001
		(0.002)	(0.002)	(0.001)	(0.002)
Material Handling and Conditioning and Storage Machinery and Accessories	0.005	0.000	0.002	0.001	0.000
		(0.002)	(0.002)	(0.002)	(0.002)
Commercial, Military, Private Vehicles and Accessories and Components	0.042	0.000	0.004	0.005	0.006
		(0.013)	(0.012)	(0.009)	(0.011)
Power Generation and Distribution Machinery and Accessories	0.005	-0.003	-0.000	-0.001	-0.001
		(0.003)	(0.003)	(0.002)	(0.003)
Tools and General Machinery	0.002	-0.001	-0.001	-0.000	-0.000
		(0.001)	(0.001)	(0.001)	(0.001)
Structures, Building, Construction, Manufacturing Components and Supplies	0.025	0.007	0.017	0.013	0.016
		(0.015)	(0.013)	(0.009)	(0.011)
Manufacturing Components and Supplies	0.008	-0.002	-0.002	-0.001	-0.001
		(0.004)	(0.003)	(0.002)	(0.002)
Electronic Components and Supplies	0.002	-0.001	-0.001	-0.000	-0.000
		(0.001)	(0.001)	(0.000)	(0.001)
Electrical Systems and Lighting and Components and Accessories and Supplies	0.009	0.003	0.002	0.003	0.001
		(0.008)	(0.007)	(0.006)	(0.007)
Distribution and Conditioning Systems and Equipment and Components	0.005	0.000	0.000	0.000	0.000
		(0.001)	(0.001)	(0.001)	(0.001)
Laboratory and Measuring and Observing and Testing Equipment	0.038	−0.012*	-0.007	−0.008*	-0.008
		(0.007)	(0.007)	(0.004)	(0.005)

Impact on Share of Spending by 2-Digit Product Classification, Part 2

	(1)	(2)	(3)	(4)	(5)
	Comparison mean (±4)	Linear estimate (±4)	Quadratic estimate (±10)	Linear estimate (optimal BW)	Linear estimate (optimal BW)
Medical Equipment and Accessories and Supplies	0.061	-0.004	-0.005	-0.005	-0.008
		(0.009)	(0.009)	(0.006)	(0.007)
Information Technology Broadcasting and Telecommunications	0.050	-0.008	-0.005	-0.008	-0.009
		(0.011)	(0.008)	(0.007)	(0.009)
Office Equipment and Accessories and Supplies	0.035	-0.001	0.002	0.001	0.002
		(0.008)	(0.006)	(0.004)	(0.004)
Printing and Photographic and Audio and Visual Equipment and Supplies	0.005	0.001	0.001	0.001	0.001
		(0.002)	(0.002)	(0.001)	(0.002)
Defense and Law Enforcement and Security and Safety Equipment and Supplies	0.007	0.005	0.008	0.005	0.006
		(0.007)	(0.007)	(0.005)	(0.006)
Cleaning Equipment and Supplies	0.007	0.003	0.002	0.003*	0.003**
		(0.002)	(0.002)	(0.001)	(0.002)
Service Industry Machinery and Equipment and Supplies	0.001	-0.000	0.000	-0.000	-0.000
		(0.001)	(0.001)	(0.001)	(0.001)
Sports and Recreational Equipment and Supplies and Accessories	0.008	-0.000	-0.003	-0.002	-0.001
		(0.005)	(0.003)	(0.002)	(0.002)
Food Beverage and Tobacco Products	0.022	-0.002	-0.004	-0.002	-0.003
		(0.004)	(0.003)	(0.003)	(0.003)
Drugs and Pharmaceutical Products	0.050	0.009	0.005	0.005	0.005
		(0.010)	(0.008)	(0.004)	(0.006)
Domestic Appliances and Supplies and Consumer Electronic Products	0.006	0.000	0.002	0.000	0.000
		(0.002)	(0.001)	(0.001)	(0.002)
Apparel and Luggage and Personal Care Products	0.009	-0.000	-0.003	-0.002	-0.002
		(0.002)	(0.002)	(0.002)	(0.002)
Timepieces and Jewelry and Gemstone Products	0.000	-0.000	-0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)	(0.000)
Published Products	0.013	-0.002	-0.003	-0.003	-0.005
		(0.004)	(0.005)	(0.004)	(0.004)
Furniture and Furnishings	0.016	0.001	0.002	0.000	0.001
		(0.005)	(0.004)	(0.003)	(0.004)
Musical Instruments, Games, Toys Arts, Crafts and Educational Materials	0.015	0.002	0.005	0.003	0.004
		(0.009)	(0.007)	(0.005)	(0.006)
Farming and Fishing and Forestry and Wildlife Contracting Services	0.018	-0.007	-0.007	-0.008	-0.010
		(0.008)	(0.006)	(0.006)	(0.007)
Mining and oil and gas services	-0.000	-0.001	0.001	-0.000	-0.000
		(0.002)	(0.003)	(0.001)	(0.002)
Building and Facility Construction and Maintenance Services	0.102	0.011	-0.003	0.001	0.006
		(0.034)	(0.029)	(0.022)	(0.026)
Industrial Production and Manufacturing Services	0.006	-0.003	-0.002	-0.003	-0.004
		(0.002)	(0.003)	(0.002)	(0.002)

Impact on Share of Spending by 2-Digit Product Classification, Part 3

	(1)	(2)	(3)	(4)	(5)
	Comparison mean (±4)	Linear estimate (±4)	Quadratic estimate (±10)	Linear estimate (optimal BW)	Linear estimate (optimal BW)
Industrial Cleaning Services	0.017	0.003	0.005	0.004	0.005
		(0.011)	(0.010)	(0.008)	(0.010)
Environmental Services	0.000	-0.001	-0.000	-0.001	-0.001
		(0.001)	(0.001)	(0.001)	(0.001)
Transportation and Storage and Mail Services	0.049	0.002	0.005	0.001	0.000
		(0.007)	(0.008)	(0.005)	(0.007)
Management and Business Professionals and Administrative Services	0.063	0.001	-0.001	-0.003	-0.007
		(0.023)	(0.020)	(0.014)	(0.017)
Engineering and Research and Technology Based Services	0.024	0.009	0.007	0.001	0.003
		(0.012)	(0.011)	(0.009)	(0.011)
Editorial and Design and Graphic and Fine Art Services	0.030	−0.012*	−0.015*	-0.008	-0.010
		(0.007)	(0.007)	(0.007)	(0.009)
Public Utilities and Public Sector Related Services	0.004	0.006	-0.001	-0.001	-0.001
		(0.005)	(0.004)	(0.003)	(0.003)
Financial and Insurance Services	0.006	0.006	0.005	0.006	0.006
		(0.007)	(0.007)	(0.006)	(0.007)
Healthcare Services	0.041	-0.003	0.009	0.006	0.007
		(0.011)	(0.009)	(0.006)	(0.007)
Education and Training Services	0.028	-0.004	0.002	-0.001	-0.000
		(0.009)	(0.009)	(0.006)	(0.008)
Travel and Food and Lodging and Entertainment Services	0.027	-0.005	-0.004	-0.004	-0.004
		(0.007)	(0.008)	(0.005)	(0.006)
Personal and Domestic Services	0.009	0.001	-0.000	0.000	0.001
		(0.002)	(0.001)	(0.001)	(0.001)
National Defense and Public Order and Security and Safety Services	0.014	-0.004	-0.001	0.000	0.002
		(0.003)	(0.004)	(0.003)	(0.004)
Politics and Civic Affairs Services	0.008	0.001	0.001	0.001	0.002
		(0.004)	(0.006)	(0.006)	(0.008)
Organizations and Clubs	0.006	-0.002	-0.004	-0.003	-0.004
		(0.003)	(0.002)	(0.002)	(0.003)

Notes: Each coefficient stems from a separate reduced form RDD regression following the specification of Equation (2). The outcome variable is the share of spending by product using the 2-digit product classification in the UNSPSC Classification (2004). Column (1) shows control means in the ±4 bandwidth. Column (2) shows estimations for the ±4 and Column (3) for the ±10 bandwidth. Columns (4) and (5) employ the mean-squared-error-optimal bandwidth following Guido Imbens and Karthik Kalyanaraman (2012)). Column (5) in addition reports bias-corrected estimates and robust standard errors following Sebastian Calonico, Matias D. Cattaneo and Rocio Titiunik (2014). Each observation is an entity-year. All specifications contain control variables including a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lag of log (+1) of total amount purchased, and of auction, direct contract shares, and the outcome variable. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. ***p<0.01, **p<0.05, *p<0.1

Table D5: Impact on Share of Spending Through Auctions and Direct Contracting, Robustness Check: Products With Meaningful Choice of Procurement Procedure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Product sample	100%		≈ 90%		≈ 80%		≈ 70%	
				Panel A: Auctions				
1{Relative importance ≥ cutoff}	−0.079***	−0.089**	−0.076**	−0.083**	−0.079**	−0.087**	−0.077**	−0.086**
	(0.030)	(0.036)	(0.030)	(0.036)	(0.032)	(0.038)	(0.033)	(0.040)
Bandwidth	±5.19	±5.19	±5.70	±5.70	±5.91	±5.91	±5.74	±5.74
Observations	604	604	646	646	667	667	646	646
R-squared	0.573	0.573	0.551	0.551	0.520	0.520	0.515	0.515
Comparison mean	0.666	0.666	0.649	0.649	0.660	0.660	0.644	0.644
				Panel B: Direct Contracting				
1{Relative importance ≥ cutoff}	0.069***	0.077***	0.065***	0.072***	0.058***	0.064**	0.052**	0.058**
	(0.024)	(0.028)	(0.023)	(0.027)	(0.022)	(0.026)	(0.023)	(0.027)
Bandwidth	±5.05	±5.05	±5.26	±5.26	±5.89	±5.89	±6.08	±6.08
Observations	593	593	610	610	664	664	673	673
R-squared	0.498	0.498	0.526	0.526	0.518	0.518	0.518	0.518
Comparison mean	0.125	0.125	0.129	0.129	0.132	0.132	0.137	0.137
Stratum fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table provides a robustness check for results in Table 4, Columns (7) and (8) (optimal bandwidth specification following Equation (2). It shows the results for the subset of products with a meaningful choice of purchase procedure. Columns (1) and (2) correspond to the full sample. The following columns exclude the products with the least variation in procurement procedures. Columns (3) and (4) exclude the ∼10% of spending on those products with the smallest auction or direct contracting shares (i.e. such that the share of total spending at the cutoff corresponds to ∼90%). Columns (5), (6) and (7), (8) exclude ∼20% and ∼30% of spending respectively. The included products for each of the three subsets have auction or direct contracting shares of less than ∼97%, ∼93%, and ∼90%, respectively. Each observation is an entity-year. Control variables include a dummy for having been audited in the preceding year (audits data are not available for two years earlier), political affiliation, as well as first and second lags of log (+1) of total amount purchased, and of auction and direct contract shares. Standard errors are clustered at the stratum level. A stratum refers to a cell defined by year and internal unit. ***p<0.01, **p<0.05, *p<0.1

E Survey Evidence on Penalties and Other Consequences for Detected Infractions

To shed light on the consequences of detected infractions in audits, our country-wide survey investigated procurement officers' beliefs about the nature of consequences and their perceived severity. While much of the analysis of deterrence from audits—building on the seminal model of crime by Becker (1968)—has focused mainly on legal consequences of detected infractions, such as prosecutions and penalties, we document that there are many additional consequences that play an important role in our setting, including career concerns, social-image concerns and self-image concerns. Even though the expected risk of legal penalties is relatively low, officers perceive overall consequences as severe.

The survey contains two parts to investigate these issues: First, participants were asked about the range of consequences that arise when the Comptroller detects infractions related to public procurement. Second, we asked officers to indicate for a number of situations how bad they would be for them on a scale from 0 to 10. Three of these vignettes involve financial losses, while one is about an audit in which the Comptroller detects the type of infractions for which our study audits showed a higher likelihood for auctions. This allows us to analyze beliefs on how severe the detection of infractions is compared to financial losses.

1. Consequences That Arise When the Comptroller Finds Infractions in Procurement

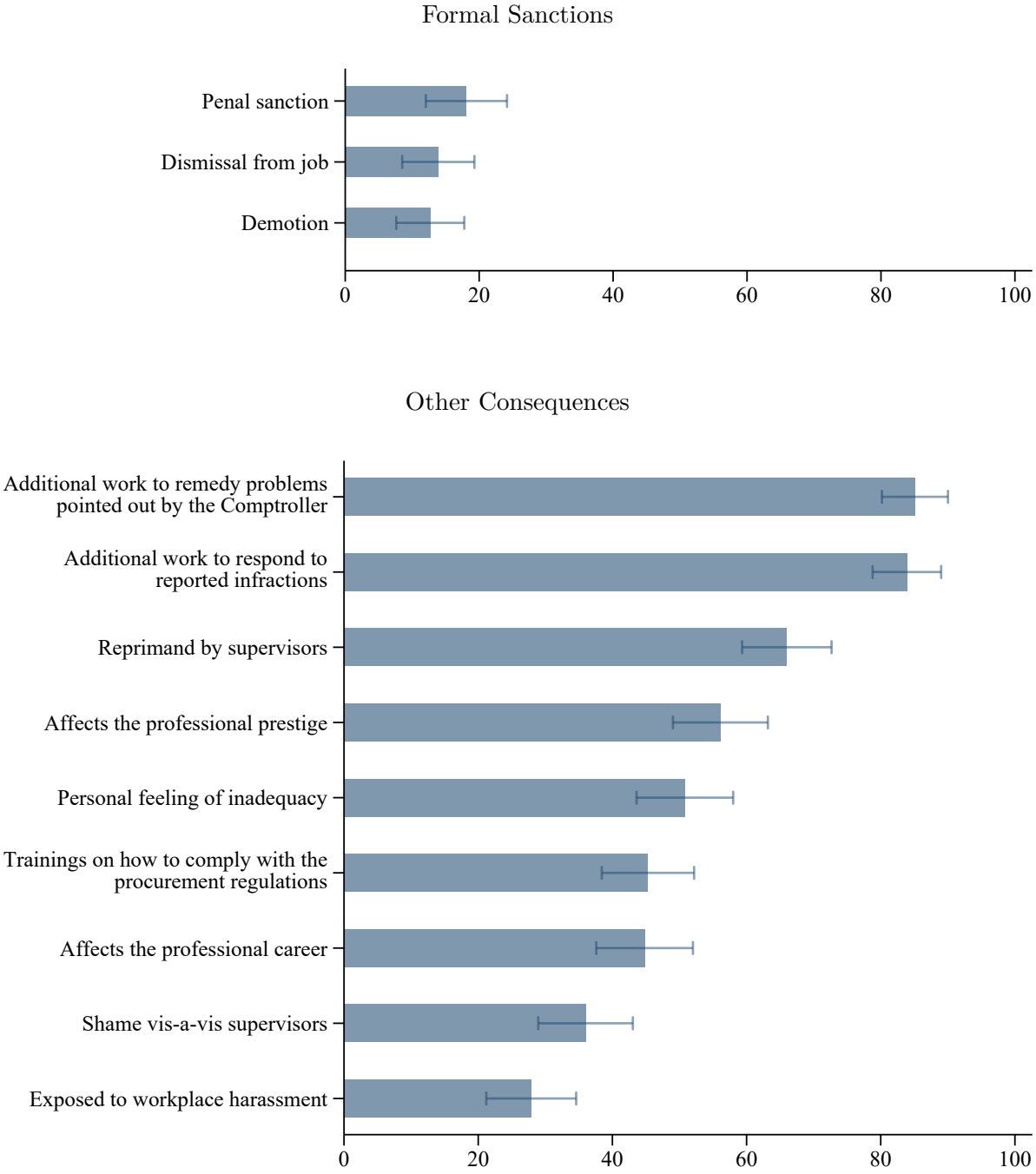
Respondents were asked about the consequences for procurement officers who are involved in the awarding of a contract, when the Comptroller finds infractions in the procurement process of that contract. Participants indicated how likely they believed a number of potential consequences to be. We created the list of potential consequences based on extensive piloting of the survey, which included open answers and qualitative interviews as well as points raised by referees.

The figure below shows the percentage of respondents who indicated that a given consequence was very likely to happen. The first thing that stands out is that fewer respondents

see formal sanctions as very likely than is the case for other consequences. Fewer than 20% indicate that penal sanctions, dismissal or demotion are very likely. At the same time, the share of respondents who say other consequences are very likely ranges from 27.9% (workplace harassment) to 85.1% (additional work).

Issues of professional standing figure prominently. Over 65% say that reprimands by supervisors are very likely. Over 55% state this with regards to impacts on the professional prestige, and over 40% about impacts on the professional career. Personal impacts are another key affected area. Over half state that personal feelings of inadequacy are very likely and about $\frac{1}{3}$ indicate this for shame vis-à-vis their supervisor. Finally, almost all respondents agree that there would likely be additional work to remedy the problems pointed out by the Comptroller and to respond to the Comptroller's report. (Over 80% say this is very likely.)

Figure E1: Consequences of Detected Infractions in the Procurement Process
Share of Respondents Who Say a Given Consequence Is Very Likely



Notes: This figure shows procurement officer beliefs about the consequences that arise when the Comptroller finds infractions in the procurement process. Bars show the percentage of respondents who indicate that a given consequence is very likely, with 95% confidence intervals.

2. Quantifying Severity of Audit Detection in Comparison to Financial Loss Scenarios

Given the non-formal nature of many of these consequences, the question arises how severe such consequences are for the affected officers. To quantify the perceived severity, we used a vignette approach. We showed respondents four scenarios and asked them to indicate for each of them on a scale of 0 to 10 how bad they would be for them. The goal of these vignettes was to benchmark how severe procurement officers experience the impacts of being detected by an audit compared to tangible financial losses. We first asked about the following audit scenario, then about 3 financial scenarios.

The audit vignette is a situation where the Comptroller detects infractions in the awarding process of procurement contracts, such as for example that the contract did not go to the best offer according to the criteria stipulated in the auction, or that the deadlines for opening of technical bids were not met.

We chose those two examples of infractions based on the data from our study audits, where they represent the most frequently detected serious and less serious infractions for the awarding stage. Hence they are typical kinds of additional infractions incurred when officers would choose an auction over a direct contract. (By "serious'' we refer to the type of infraction that often leads to follow-up investigations. As Table A12 shows, the likelihood of such follow-up investigations is twice as high for auctions as for comparable direct contracts.)

The three financial scenarios were as follows:

- A situation in which the respondent's entity does not obtain half of their institutional bonus for institutional effort. (This corresponds to a 3.8% lower pay.[6] In addition, when an entity fails to get the institutional bonus, this may also lead to reorganizations, etc.)

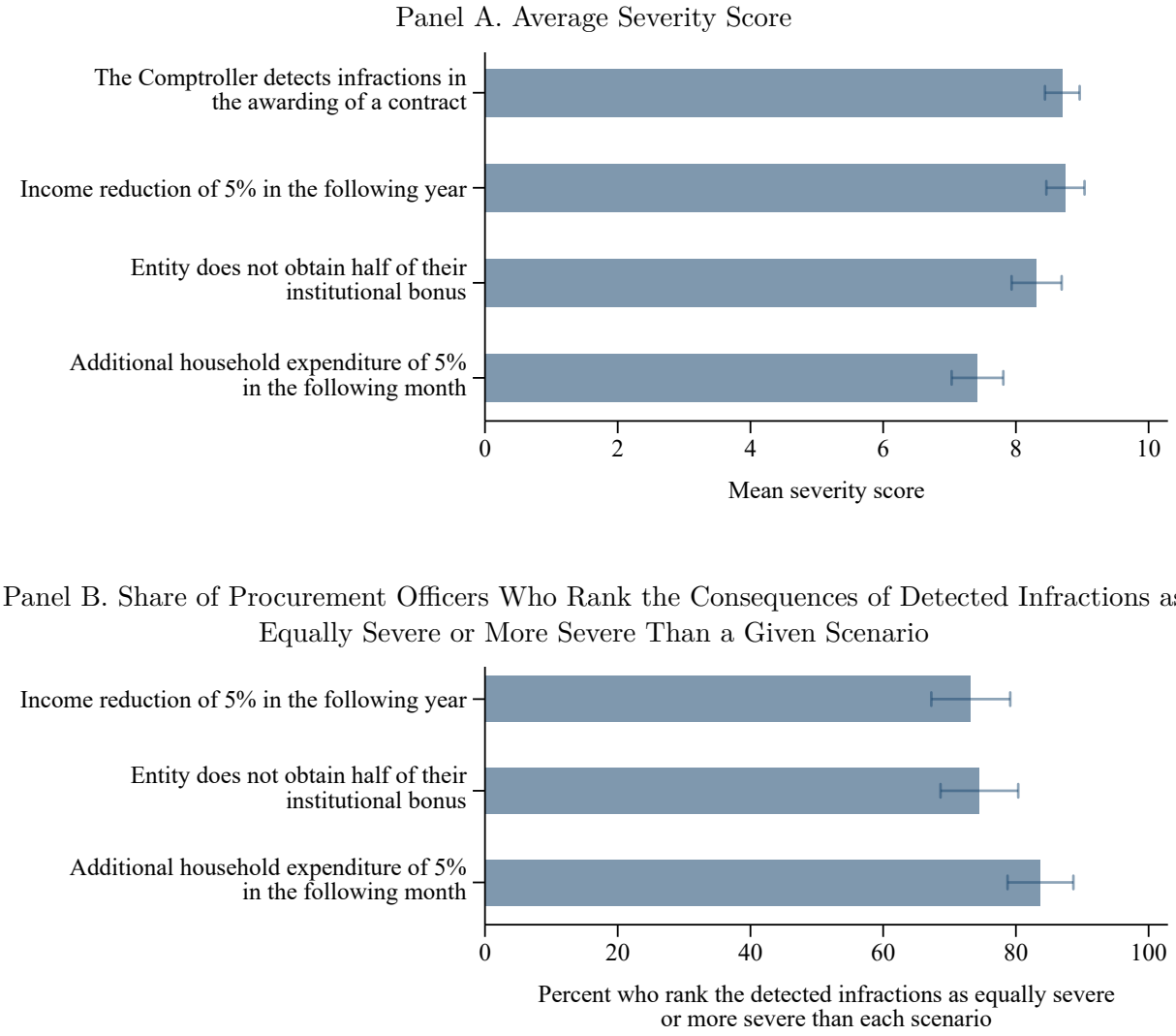
[6]In Chile, public entities have incentive pay at the institutional level. If the institutional goals are met 90% or more, each employee receives a 7.6% bonus. If the goals are met between 75 and 90%, they receive a 3.8% bonus. If less than 75% of the goals are met, there is no bonus. The bonus is paid 4 times a year.

- A situation in which the respondent's household has an additional expenditure of 5% in the coming month.
- A situation in which there are budget cuts, which result in a reduction of the respondent's income of 5% in the coming year.

The results show that procurement officers on average ranked the consequences of the detections of infractions by the Comptroller as similar to a salary reduction of 5% in the following year (severity scores of 8.7 and 8.8 respectively), and more severe than a loss of half of the annual bonus for their entity (8.3) or a 5% additional expense in the coming month (7.4).

Comparing the audit vignette score to the financial vignettes for a given individual, we find that 84% of respondents gave the audit vignette a severity score that was as high or higher than the score for the 5% additional expense. Similarly, about 79% scored the audit vignette at least as severe as the 5% wage reduction or the foregone institutional bonus scenario.

Figure E2: Severity of Consequences of Detected Infractions



Notes: This figure shows the perceived severity of consequences of detected infractions in comparison with three types of financial shocks. The vignette of "detected infractions in the awarding of a contract" refers to two examples of detected infractions, corresponding to the type of infractions that were most commonly detected in our study audits. Panel A indicates the average severity score (on a scale from 0 to 10) of the four different vignettes. Panel B shows the share of procurement officers who ranked the vignette of detected infractions as equally severe or more severe than the respective financial vignette. 95% confidence intervals shown to the right.

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