Phoning Home: The Procurement of Telecommunications Services for Prison Systems in the United States[*]

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Abstract

When incarcerated individuals in the United States purchase goods and services, they do so from monopoly vendors selected by their correctional authority. We study the case of inmate calling services (ICS), where the Federal Communications Commission has recently characterized prices as "exorbitant." We obtain and analyze data from public records requests that we submitted to all fifty states.

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1 Introduction

More than two million people are incarcerated in prisons and jails in the United States.[1] These individuals use telephone calls to maintain contact with family, friends, and counsel. For this, they pay prices that the Federal Communications Commission (FCC) recently characterized as "exorbitant."[2] A nonprofit advocacy group estimated in 2019 that a typical 15-minute call costs about $6.00 in local jails and about $1.75 in state prisons.[3] The popular press has placed the total annual expenditures of incarcerated individuals on phone calls at over one billion dollars.[4] This has attracted the scrutiny of regulators and policy-makers over the previous two decades. However, little academic research has examined the economic incentives that generate the prices that arise or the likely efficacy of regulatory remedies.

In this paper, we provide an initial empirical study of inmate communications services (ICS). Our particular focus is on the procurement of ICS for state-level prison systems. It is through the procurement process that the financial terms of trade are set, including the prices that determine what incarcerated individuals must pay to make a phone call. We base the study on documents from public records requests that we submitted to all fifty states, covering the request for proposals (RFPs) issued by Departments of Corrections (DOCs), all bids submitted by prospective ICS providers, how the bids were evaluated, and the ensuing contracts. We describe the procurement processes used and provide descriptive analyses of the data. We then estimate an auction model of procurement and use counterfactual simulations to evaluate how various regulatory interventions would affect market outcomes.

We organize the paper as follows. We first describe the procurement processes used for ICS (Section 2), which resemble first-price score auctions. A striking feature is that bids are often evaluated based on how much of the ICS provider's revenue will be given to the contracting authority (a payment known as the "commission"). Thus, money flows from incarcerated individuals and their social contacts to the provider and, often, from the provider to the contracting authority. This may create an incentive for prospective ICS providers to propose higher call prices, all else equal, so that they can afford larger commission payments. Providers are differentiated in their technical capabilities—or, at least, in how their technical capabilities are perceived by contracting authorities—and two providers have most of the state-level contracts. Together, these facts indicate that market power also may distort market outcomes.

We next provide summary statistics and descriptive analyses (Section 3). Across the procurement events ("auctions") for which we received all requested documents, the average price

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[1]See the "Census of State and Federal Adult Correctional Facilities, 2019" and the "Census of Jails 2005-2019" reports published by the Bureau of Justice Statistics.

[2]Federal Communications Commission, "Third Report and Order, Order on Reconsideration, and Fifth Further Notice of Proposed Rulemaking," released May 24, 2021.

[3]See the press release of the Prison Policy Initiative titled "State of Phone Justice: Local Jails, State Prisons, and Private Phone Providers," written by Peter Wagner and Alexi Jones, and dated February 2019.

[4]Todd Shields, "Prison Phones Prove Captive Market for Private Equity," *Bloomberg BusinessWeek* (October 4, 2012).

of a 15-minute, collect phone call (the "rate") is $1.62, close to the estimate of the nonprofit advocacy group cited above. We estimate that the average commission payment is $11.34 per inmate-month. Among the auctions that result in a commission payment, this amounts to 67% of the revenue obtained from incarcerated individuals and their social contacts.

We use regression to examine the scoring process in greater detail. First, we find that bids that receive higher scores in the evaluation process tend to propose lower rates and higher commissions, on average, conditional on those financial terms entering the scoring rule specified by the contracting authority in the RFP. In the presence of commissions, the assigned scores appear less responsive to rates, all else equal. Second, we find that providers tend to submit bids with higher commissions when commissions receive more weight in the scoring rule, consistent with providers responding to their economic incentives. Providers also tend to propose lower rates when rates receive more weight and higher rates when commissions receive more weight, though only the latter relationship is statistically significant.

We also explore how calling patterns changed with sudden, drastic price reductions that were implemented in New York prisons in 2010 and in New Jersey prisons in 2014. In both cases, we document that the average number of calls per inmate-month increased substantially (from 8.82 to 15.86 in New York and 8.32 to 27.00 in New Jersey). The average number of minutes of use increased similarly, even as total expenditures on ICS fell by 40% in New York and 56% in New Jersey. Interpreting the variation causally, we estimate a demand function for calls that we make use of in the empirical model of procurement.

The model and counterfactuals will examine various regulatory remedies. Thus far, federal regulation of the ICS industry has taken the form of FCC Orders. In 2013, the FCC instituted rate caps of $0.25 per minute for collect calls and $0.21 per minute for prepaid and debit calls. The Order was contested legally, and in 2017 the District of Columbia Court of Appeals ruled that the FCC does not have the statutory authority to regulate intrastate rates. As a result, the rate caps in the 2013 Order only applied to (less common) interstate calls. In 2021, the FCC further reduced interstate rate caps to $0.12 per minute for prisons and $0.14 per minute for larger jails.[5] The FCC is currently in a rule-making stage regarding the implementation of the Martha Wright-Reed Act.

Ten states have recently passed laws to eliminate commissions in ICS contracts covering their state-level facilities.[6] Others have implemented or scheduled implementation of free calls: Connecticut declared prison phone calls would be free of charge in 2020, California made audio calls free in 2023, Colorado passed a law to make calls free by 2025, Minnesota declared costs to be free as of 2023, and later in 2023 Massachusetts followed suit.[7] Other states, including

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[5]Federal Communications Commission, "Third Report and Order, Order on Reconsideration, and Fifth Further Notice of Proposed Rulemaking," released, May 24, 2021.

[6]The states are Colorado, Illinois, Maryland, Nebraska, New Jersey, New Mexico, New York, Ohio, Rhode Island, and South Carolina.

[7]These laws are respectively, Senate Bill 972 in Connecticut, Senate Bill 1008 in California, House Bill 23-1133 in Colorado, SF 2909 in Minnesota, and H. 1796 in Massachusetts.

New York and New Jersey, have passed laws directing DOCs to place an emphasis on the lowest proposed cost to users when awarding telephone service contracts in correctional facilities.[8] Still, commissions remain legal in 39 states, and many of the aforementioned changes apply to state prison facilities but not county jails.

2 Inmate Calling Services

The industry involves three main types of actors: incarcerated individuals and their social contacts ("users"), contracting authorities, and ICS providers. The contracting authority that handles procurement of ICS for most state-level prison systems is the Department of Corrections (DOC); for county jails, it is often a sheriff's office. The providers are privately owned telecommunications companies, such as Securus, Global Tel*Link (GTL), and IC Solutions.

Most incarcerated individuals reside in a county jail before sentencing and in a state prison facility after sentencing.[9] Facility-specific rules determine their access to phones and who they can call. The rules also limit the duration of calls. A typical maximum call length is 15 minutes, but some facilities allow 20- or 30-minute calls. Calls are recorded by the provider for security purposes. Payments from users to the ICS provider are based on a pricing schedule set during the procurement process. The cost of a call can depend on its length, whether it is intrastate or interstate, and who pays (i.e., whether it is a collect call), among other factors. There can also be a fixed connection charge for each call.

The procurement process resembles a first-price scoring auction. The broad contours of the process are as follows: First, the contracting authority issues a request-for-proposal (RFP) that outlines the technical requirements that providers must meet and that specifies a binding scoring rule that describes how the contracting authority will evaluate bids. The scoring rule includes the weight to be placed on different aspects of the bids. There is a formal question-and-answer period, and prospective bidders sometimes can participate in formal visits ("walk-throughs") of the facilities. Second, prospective providers submit bids that describe their technical capabilities and propose financial terms. Finally, the contracting authority evaluates the bids according to the scoring rule, and the provider with the highest score wins the contract at the terms that they propose. Contracts often are 3-5 years in duration.[10]

The technical capabilities of the provider receive considerable weight in the scoring rule. Contracting authorities prefer providers that provide robust security services, including call

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[8]New York Consolidated Laws, Correction Law - COR Â§ 623 was passed in 2021 and New Jersey bill S-1880 in 2016.

[9]The Federal Bureau of Prisons (FBP) and Immigration and Customs Enforcement (ICE) also operate facilities that house individuals charged or convicted of violating federal laws and immigration laws, respectively.

[10]Many procurement processes differ from our description to some extent. For example, some contracting authorities conduct the bidding in two rounds, with a subset of suppliers being asked to present more information—and possibly better financial terms—in the second round. Furthermore, losing bidders can contest the decision, which occasionally succeeds in changing the outcome.

monitoring, voice biometrics detection, three-way call prevention, searchable databases, and so on. Sometimes, these capabilities are assessed directly by the contracting authority; other times, inferences are made from the provider's demonstrated ability to win contracts for similar prison systems or from reference letters.

The other inputs to the scoring rule are financial terms: the pricing schedule and the commission. The pricing schedule determines how much users pay for calls. The commission is the amount of money the provider proposes to pay the contracting authority, either in absolute terms or as a percentage of revenue. Thus, the flow of payments goes from users to the provider and from the provider to the contracting authority. In many procurement processes, the contracting authority predetermines either the pricing schedule or the commission. In others, both are subject to bidding; in those cases, they are typically evaluated separately. The commissions that contracting authorities receive are placed in "inmate welfare funds," which, in principle, support purchases of books, exercise equipment, and other amenities valued by incarcerated individuals.[11]

Three providers have the bulk of the contracts for prison systems: Securus, GTL, and, to a lesser extent, IC Solutions. In the 1990s, at the height of competition in the market, almost 30 different ITS providers competed for prison and jail contracts. Over time, the market consolidated, mainly through the acquisition of smaller providers by GTL and Securus. Most recently, GTL acquired Telmate in 2018, the DOJ blocked a proposed acquisition of IC Solutions by Securus in 2019 on antitrust grounds, and IC Solutions acquired CenturyLink in 2020. A greater number of providers have contracts with county jails: Securus, GTL, and IC Solutions have a significant presence in jails, as do smaller companies like NCIS and CPC.

The large providers have two main revenue streams. The first comes from the prices charged for the phone calls that incarcerated individuals make. The second comes from ancillary fees. The fees are obtained in a variety of ways. As one example, providers can require that calls be made using prepaid calling cards, and can levy fees when money is placed on those cards. Commissions are not paid on the revenue obtained from ancillary fees. Our understanding is that fee data are not typically shared with public entities (e.g., the procuring authorities) and cannot be obtained with public record requests. Still, some evidence indicates that fee revenue is significant. The FCC determined that ancillary fees raised the costs to incarcerated individuals and their social contacts by as much as 40%.[12]

There are at least two major costs associated with providing ICS. First, when providers start serving clients, they install their own phones and equipment (the telecommunication lines,

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[11]A recent report of the Prison Policy Initiative examines inmate welfare funds in some detail and claims that oversight is weak and the funds often are misused, for example, to pay for operational expenses that would normally come from the general budget, equipment for staff (e.g., body cameras and uniforms), or in an extreme case, to purchase gift cards for staff (Nam-Sonenstein, 2024).

[12]See FCC press release October 22, 2015, DOC-335984A1. Also notable is that one provider recently settled a class action lawsuit that alleged it had seized over $100 million from prepaid accounts following periods of inactivity. See Githieya v. Glob. Tel*Link Corp., USDC (N.D. Ga.), Case No. 1:15-CV-00986.

though typically do not need to be replaced). Second, providers operate and pay for data centers that store call recordings and associated metadata. As private equity companies own the large providers, high-fidelity financial information that breaks down the relative magnitude of these costs is not publicly available. Qualitatively, the cost of an "install" increases with the number and size of the facilities, and data center costs increase with the calls being made.

3 Data and Empirical Analyses

3.1 Data Collection and Summary Statistics

Our data comes from requests for public records that we submitted to all 50 states in the 2020-2021 academic year. Thus, data pertain to state prison systems rather than county jails. We targeted documents and data on ICS that span the previous two decades. In particular, we asked for the RFPs, all of the bids submitted by providers, how those bids were evaluated and scored, and the contracts with the winning providers. We also requested aggregated data on the number of calls and the total minutes of use, both at the monthly level, along with the average daily population (ADP) in the prison system.[13]

We ultimately analyze 37 distinct procurement processes ("auctions") for which we received a complete set of documents and data. Table 1 shows selected summary statistics.[14] We first report *auction-level statistics* about the financial terms proposed by the winning bidder, the number of bids, and the scoring rule weights that are placed on the rate, the commission, and the technical capabilities of the providers. By "rate," we refer to the price of a 15-minute local, collect call.[15] The commission measure is the payment from the provider per inmate-month.[16] We use "technical capabilities" as a summary measure of various auction-specific considerations that relate to the technical and subjective assessments of a bidder.[17] The average rate is \$1.65 and the average commission payment per inmate-month is \$11.34. There is significant variation in rates and the commissions across auctions. There are an average of 4.19 bids per auction. The average rate, commission, and technical weights are 0.22, 0.12, and 0.66, respectively.

That the rate and commission weights are commonly zero reflect that these terms are sometimes predetermined by the procuring entity. In the scoring rules, a positive weight is placed on the pricing schedule in 25 of 37 auctions (68%), and on the commission in 17 of 37 auc-

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[13]Negotiating the public records requests and processing the files was an endeavor. The files were often not digitized and came in different formats. Responses were limited by the states' compliance requirements, their willingness to engage with our request, and their document retention practices. Still, we received at least some information from 43 states, and we obtained a complete set of documents and data on at least one procurement event from 26 states. Nine states provided a complete set of documents for multiple procurement events.

[14]We provide more detailed information on the individual auctions in Appendix Table A.1.

[15]Local, collect calls are among the most popular, and average call duration is often around 15 minutes.

[16]We the construction of the commission measure later in this section.

[17]For example, in 2016 North Dakota considered: information technology, experience and qualifications, financial strength, and demonstration of each bidder. We treat all of these as part of a bidder's technical capabilities.

Table 1: Selected Summary Statistics

	Mean	St. Dev.	10%	25%	50%	75%	90%
Auction-Level Statistics							
Rate	1.62	1.32	0.27	0.58	1.65	2.25	3.12
Commission	11.34	10.53	0	0.05	10.74	19.61	28.27
Number of Bids	4.19	1.63	3.00	3.00	4.00	5.00	6.00
Rate Weight	0.22	0.23	0	0	0.20	0.33	0.43
Commission Weight	0.12	0.19	0	0	0	0.15	0.32
Technical Weight	0.66	0.23	0.39	0.60	0.70	0.80	0.88
Bid-Level Statistics							
Rate	1.33	1.11	0.27	0.50	0.90	1.73	2.72
Commission	17.52	8.35	5.62	11.35	16.67	23.65	28.28
Rate Score	0.71	0.28	0.32	0.54	0.76	0.99	1.00
Commission Score	0.75	0.25	0.42	0.66	0.83	0.92	1.00
Technical Score	0.76	0.18	0.50	0.64	0.80	0.92	0.98

Notes: The auction-level statistics are based on 37 distinct procurement events. The rate is the cost of a 15-minute local, collect call, and the commission is in dollars per inmate-month. The bid-level statistics are based on 155 distinct bids. They are conditional, in the sense that we restrict the sample for rates and rate scores to bids in auctions that place a positive weight on rates, and analogously for commissions and commission scores. The scores are measured as a fraction of the total points available.

tions (46%). Conditional on being positively weighted, the mean weight placed on the pricing schedule is 33%, and the mean weight placed on the commission is 26%.

The table also provides *bid-level statistics*, based on the 155 bids that were submitted to the same set of auctions. We examine the proposed rates and commissions, and the scores that were assigned to these terms and to technical capabilities. The summary statistics are conditional, in the sense that, for example, we use those rates and rate scores that correspond to auctions that place a positive weight on rates in the scoring rule. The mean proposed rate is $1.33 and the mean proposed commission is $17.52. The mean scores—which we measure as a fraction of the maximum available points—are 0.71 for rates, 0.75 for commissions, and 0.76 for technical capabilities. There is significant variation in these scores.

Extending our analysis of the raw data, we observe that the average rate in auctions with a rate fixed by the procuring entity tends to be higher than the average rate in auctions in which the rate is considered in the scoring rule ($2.18 versus $1.35). This suggests that predetermined rates may not necessarily be favorable for incarcerated individuals. Anticipating the model that we introduce later, in the presence of commissions, the procuring entity may prefer rates that generate more revenue from incarcerated individuals.

The selected provider pays a commission in 29 of the 37 auctions (78%). This includes 12 auctions for which the commission is predetermined, as opposed to being the result of the bidding process. Most commonly, the commissions are a percentage of revenues that the provider obtains (excluding fees). Among these auctions, the average payment is 55% of non-fee revenue. Six auctions result in fixed commission payments that do not depend on revenue.

The average such payment in our data is $13.57 per inmate-month.[18] The commission measure that we report in Table 1 collapses the percentage and fixed commissions into a single number, using a demand function that we estimate (Section 3.4) and the implied non-fee revenue.[19] We find that, among auctions resulting in a commission payment, the average non-fee revenue is $21.66 per inmate-month, and the average commission payment is $14.47 per inmate-month. Thus, an average of 67% of the provider's non-fee revenue accrues to the procuring entity.

As a final comparison, auctions that do not result in a commission payment generate less revenue for the selected provider, on average. Again combining data on rates and ADP and our demand estimates, we obtain an average non-fee revenue of $17.03 per inmate-month for the providers selected in procurement processes without commissions payments. The main reason that non-fee revenue is lower without commissions is that rates are lower—the average rate is $0.97 without commissions and $1.75 with commissions.

3.2 Analysis of Scoring Rules

In ICS procurement auctions, the score that is assigned to the providers' bids is a weighted average of a rate score, a commission score, and a score for technical capabilities. In this section, we examine the empirical relationships between rates and commissions and their respective scores. Our approach is to regress the score for the proposed financial term (rate or commission) on the financial term. The empirical relationships have implications for bidding incentives. For example, if a provider proposes a lower rate, then the effect on its overall score depends on both the weight placed on the rate score and how much its rate score would improve.

Table 2 summarizes the regression results. The columns on the left focus on rates. Column (i) shows the results of a univariate regression estimated on bids in auctions that place a positive weight on rates. The coefficient indicates that if the proposed cost of a 15-minute local, collect call is $1.00 greater, then the associated rate score is 0.056 lower, on average. Columns (ii) and (iii) show that a negative relationship also obtains in the presence of provider and auction fixed effects, respectively. Thus, the results indicate that providers tend to receive lower rate scores in auctions for which they propose higher rates, and that, in any given auction, the providers that propose higher rates tend to receive lower scores.

Columns (iv) and (v) use subsamples that differ based on whether a positive weight is placed on the commission in the auction's scoring rule (in addition to the rate). The coefficient on the rate is negative in both cases, but its magnitude is larger for auctions that do not consider commissions (column (iv)), and the difference is statistically significant. This raises the

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[18]We convert the fixed commission payments to be per inmate-month using the duration of the contract and the data on ADP.

[19]To construct the measure, we first use the data on rates along with the demand function to predict the number of calls made per inmate-month. We then obtain total implied non-fee revenue by multiplying this quantity by the rate and ADP. Finally, we use the data on commissions percentage to calculate the implied payment to the procuring entity, and add this to any fixed commission payments.

Table 2: Relationships Between Proposed Terms and Assigned Scores

Dependent Variable:	Rate Score					Commission Score		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Rate	-0.056	-0.040	-0.184	-0.250	-0.040			
	(0.024)	(0.023)	(0.040)	(0.050)	(0.039)			
Commission						0.008	0.010	0.018
						(0.003)	(0.003)	(0.006)
Provider Fixed Effects	no	yes	no	no	no	no	yes	no
Auction Fixed Effects	no	no	yes	yes	yes	no	no	yes
R^2	0.050	0.452	0.925	0.910	0.984	0.110	0.280	0.972
# of Observations	106	106	106	83	23	62	62	62

Notes: The table summarizes OLS regression results. The unit of observation is a bid. The dependent variable is the rate score in columns (i)-(v) and the commission score in columns (vi)-(viii). We measure the rate score and the commission score as the fraction of the maximum available points that is awarded to a bid. The independent variables are the rate, which we measure as the price of a 15-minute local, collect phone call, and the commission, which we measure in terms of dollars per inmate/month. Columns (ii)-(iii) and (vii)-(viii) also include provider or auction fixed effects, as noted. The sample in columns (i)-(iii) includes bids in auctions that place a positive weight on rates in the scoring rule. The sample in column (iv) includes bids in auctions that place a positive weight on rates but not on commissions. The sample in column (v) includes bids in auctions that place a positive weight on both rates and commissions. The sample in column (vi)-(vii) includes bids in auctions that place a positive weight on commissions. Standard errors are in parentheses.

possibility that procuring entities that receive commissions may implicitly reduce the role of rates in the scoring rule, even holding fixed the formal weight that is placed on pricing terms in the RFP. In our empirical model, such a practice would encourage bidders to propose higher rates and support larger commissions payments.

Columns (vi)-(viii) focus on commissions.[20] The univariate regression of column (vi) shows that a \$1.00 increase in the proposed commission payment (per inmate-month) is associated with a commission score that is 0.008 higher, on average. Columns (vii) and (viii) show that the relationship between commissions and commission scores is robust to the inclusion of provider and auction fixed effects. The strength of these relationships does not appear to depend on whether a positive weight is placed on rates in the auction's scoring rule.

Overall, there is strong statistical support for the scores being responsive to the financial terms proposed by bidders. Later, when we estimate the empirical model, we interpret the regressions as providing deterministic *scoring functions* that map proposals into scores.

3.3 Auction Designs and Bids

Providers have an incentive to propose more generous financial terms (lower rates and higher commissions) when financial terms receive more weight in the scoring rule. In this section, we explore whether the empirical relationship between the auction weights and the financial

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[20]We omit from the sample three bids that receive a commission score of zero even with large proposed commissions. One was in the 2014 Utah auction, and the other two were in the 2019 Utah auction. We suspect the bidders were been disqualified for other reasons. If we include these three bids, the coefficient in column (vi) decreases in magnitude and is no longer statistically significant, the coefficient in column (vii) is roughly unchanged, and the coefficient in column (viii) increases to 0.025 and remains statistically significant.

Table 3: Relationships Between Scoring Weights and Proposed Terms

Dependent Variable:	Rate			Commission		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Rate Weight	-0.056	-0.614	-0.324			-17.54
	(0.588)	(0.621)	(0.527)			(9.527)
Commission Weight			5.64	20.143	17.015	16.456
			(0.962)	(4.673)	(5.369)	(5.247)
Constant	1.347		0.751	12.08		14.472
	(0.226)		(0.912)	(1.532)		(8.011)
Provider Fixed Effects	no	yes	yes	no	yes	yes
R^2	0.000	0.271	0.485	0.236	0.319	0.366
# of Observations	106	106	106	62	62	62

Notes: The table summarizes OLS regression results. The unit of observation is a bid. The dependent variable in columns (i)-(iii) is the rate, which we measure as the price of a 15-minute, local, collect phone call. The dependent variable in columns (iv)-(vi) is the commission, which we measure in terms of dollars per inmate/month. The independent variables are the weights that the scoring rule places on the rate and the commission, respectively. Columns (ii)-(iii) and (v)-(vi) also include provider fixed effects. The sample in columns (i)-(iii) includes bids in auctions that place a positive weight on rates in the scoring rule. The sample in column (iv)-(vi) includes bids in auctions that place a positive weight on commissions. Standard errors are in parentheses.

terms that providers propose are consistent with those incentives. Our approach is to regress the rates and the commissions on the auction weights. The coefficients are identified by variation in weights across auctions, as bids into the same auction are subject to the same weights.

Table 3 summarizes the results. The columns on the left use the proposed rate as the dependent variable. Column (i) is a univariate regression on the rate weight, column (ii) adds provider fixed effects, and column (iii) also adds the commission weight as an explanatory variable. The coefficient on the rate weight is negative, consistent with our expectations, but not statistically different from zero. The magnitude of the coefficient in column (ii) corresponds to an increase in the rate weight by 25 percentage points being associated with proposed rates that are $0.15 less expensive, per 15-minute local collect call ($0.614 \times 0.25 = 0.154$). Interestingly, in column (iii), we find that higher commission weights are associated with higher proposed rates, and the relationship is statistically significant. The magnitude of the coefficient suggests an economically meaningful relationship, as an increase in the commission weight of 25 percentage points is associated with proposed rates that are $1.41 higher.

There are at least two mechanisms that could explain the relationship between commission weights and proposed rates. First, as we discussed in the previous section, commissions appear to affect how procuring entities translate proposed rates into rate scores. Specifically, the empirical relationship between rates and rates scores is more modest if commissions receive weight in the scoring rule. Providers may infer that a higher commission weight implies that rates matter less in the auction, even holding fixed the rate weight. Second, a higher rate can provide more revenue to the provider, allowing it to pay a higher commission. Thus, higher

commission rates may induce providers to propose higher rates. These two mechanisms are not mutually exclusive and both may contribute to the empirical variation in our data.

Columns (iv)-(vi) use the proposed commission as the dependent variable. The univariate regression of column (iv) shows that providers tend to submit bids with higher commissions when the auction weights commissions more heavily in the scoring rule. The coefficient indicates that an increase in commission weight of 25 percentage points is associated with proposed commissions per inmate-month that are $5.03 higher. This relationship is robust to the inclusion of provider fixed effects (column (v)). Finally, column (vi) shows that commissions tend to be lower in auctions that place greater weight on rates. A plausible mechanism for this last effect is that a larger weight on rates induces providers to propose lower rates, and it may then be less profitable for the provider to propose the same level of commission.

3.4   The Demand for Calls

In this section, we explore how calling patterns change with price reductions that occur in two states, and then exploit the variation to estimate the demand of incarcerated individuals for calls. The first state is New York. In 2010, it eliminated a per-call connection fee of $1.28 and reduced the per-minute rate from $0.068 to $0.048. The second state is New Jersey, which stopped accepting commissions in 2014, and implemented a series of price reductions from January 2014 to May 2015 that lowered the per-minute rate from $0.33 to $0.044.[21]

We examine four variables before and after these price changes: the number of calls per person/month, the minutes per call, the calling minutes per person/day, and the expenditure per person/month. Each variable is an average across all incarcerated individuals in the state prison system and is observed monthly. A visual inspection of the data reveals that each variable is stable before the price changes (Appendix Figure A.1). Afterwards, the number of calls and calling minutes increase, yet expenditures decrease. In New York, the minutes per call decreased slightly, consistent with incarcerated individuals substituting to shorter calls in response to the elimination of per-call connection fees.

Table 4 summarizes the changes quantitatively, using "before" and "after" periods that we select based on our visual inspection of the data. The average number of calls per person/month increases from 8.82 to 15.86 in New York and from 8.32 to 27.00 in New Jersey. Sample means tests indicate that theses changes are statistically different from zero at the 1% level. Similar patterns are observed for the average minutes per inmate-day spent on the phone. Average expenditures per inmate-month decrease from $23.77 to $14.35 in New York and from $30.36 to $13.24 in New Jersey, and the changes again are statistically significant. Thus, the raw data

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[21]In both states, the same prices were charged for local, intrastate, and interstate calls, and for different payment methods (e.g., debit and collect). In New Jersey, the first change, which reduced the per-minute rate from $0.33 to $0.19, occurred in February 2014, on the direction of the DOC. We observe subsequent reductions to $0.17 in March 2014, to $0.15 in September 2014, and finally to $0.044 in May 2015. The last change was due to a new state law. There is no connection fee in New Jersey, before or after these changes.

Table 4: Calling Patterns Before and After Price Reductions

	New York				New Jersey			
	Before	After	Change	*p*-value	Before	After	Change	*p*-value
Number of Calls	8.82	15.86	7.04	0.000	8.32	27.00	18.68	0.000
Minutes per Call	20.81	18.87	-1.94	0.000	11.05	11.18	0.13	0.011
Minutes per Day	6.04	9.83	3.80	0.000	3.03	9.91	6.87	0.000
Expenditures	23.77	14.35	-9.43	0.000	30.36	13.24	-17.12	0.000

Notes: The table provides the average number of calls per inmate-month, average minutes per call, average minutes per inmate-day, and average expenditure per inmate-month (in dollars), both before and after price reductions in New York and New Jersey. It also provides the change and the *p*-value from a sample means test of the null hypothesis that the change equals zero. For New York, we use a "before" period of January-December 2009 and an "after" period of April 2010 - March 2011. For New Jersey, we use a "before" period of January-October 2013, as some data are unavailable for November-December 2013, and an "after" period of January-December 2016.

are consistent with price being a meaningful determinant of phone usage.

As the empirical model of procurement requires a demand function, we extend our analysis and estimate a simple linear relationship between quantities and prices:

$$q_{it} = \beta_0 + \beta_1 r_{it} + v_{it} \tag{1}$$

where i and t index the state and time period, respectively, q is the number of calls per person/month, r is the price of a 15-minute phone call (the rate), and v captures seasonal and idiosyncratic factors. We estimate the model using OLS with observations at the state-month level. We assume that the rate is orthogonal to the error term so that OLS obtains unbiased coefficients. Our assumption would be violated if the state-level rate changes coincide with changes in prison policies that affect prisoners' access to phones. However, we have not seen evidence that such policy changes occurred.[22]

Table 5 summarizes the regression results. We estimate the model with pooled data (column (i)), with pooled data and state-specific intercepts (column (ii)), and with separate subsamples for the two states (columns (iii) and (iv)). The results are consistent with higher rates reducing phone usage, all else equal. We interpret columns (ii)-(iv) as most reliably summarizing the variation in the data. To obtain the demand function that we use in the model of procurement, we average the final two columns: $q = 24.47 - 4.41r$. The associated revenue-maximizing rate of a 15-minute call $2.78.[23] The rate elasticities of demand evaluated at rates of $1.00, $2.00, $3.00, and $4.00 are -0.22, -0.56, -1.18, and -2.58, respectively. In the model, firms may elect to propose a rate that falls along the inelastic region of the demand curve if their net revenue is negative or if lower rates increase the likelihood of winning an auction.

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[22]Because variation in rates arises only due to the state-level policy changes, a 2SLS approach to estimation that uses state-level policy changes as instruments for price obtains identical results.

[23]The revenue-maximizing rate equals $-\frac{1}{2}\frac{\beta_0}{\beta_1}$.

Table 5: Demand for Calls

	(i)	(ii)	(iii)	(iv)
Price	-3.30	-4.37	-4.46	-4.35
	(0.38)	(0.07)	(0.27)	(0.07)
Constant	22.00		19.07	29.86
	(1.35)		(0.61)	(0.29)
NJ Constant		29.90		
		(0.28)		
NY Constant		18.93		
		(0.27)		
R^2	0.53	1.00	0.93	0.99
# of Observations	46	46	24	22
Sample	NJ/NY	NJ/NY	NJ	NY

Notes: The dependent variable is the average number of calls per inmate-month. Observations are at the state-month level. The sample for New York includes January-December 2009 and April 2010 - March 2011. The sample for New Jersey includes January-October 2013 and January-December 2016.

References

Nam-Sonenstein, Brian, "Shadow Budgets: How Mass Incarceration Steals from the Poor to Give to the Prison," 2024. `https://www.prisonpolicy.org/reports/shadowbudgets.html`.

Appendix

A   Additional Figures and Tables

Table A.1: Summary of the Bid Data

	State	Year	Rate Weight	Quality Weight	Comm. Weight	# of Bids	Winning Bidder	Rate	Commission		
									Percentage	Fixed	Total
1	Alaska	2016	0	0.56	0.44	4	Securus	1.05	0.94	0	18.32
2	Arizona	2014	0	0.17	0.83	4	CenturyLink	1.84	0.94	0	27.54
3	Arkansas	2014	0	1.00	0	4	Securus	4.80	0.73	0	21.65
4	Florida	2013	0.05	0.90	0.05	3	GTL	0.75	0.67	0	9.77
5	Florida	2017	0.17	0.83	0	3	Securus	0.19	0	0	0
6	Georgia	2015	0	0.65	0.35	3	Securus	1.95	0.97	6.73	36.19
7	Idaho	2014	0.20	0.80	0	5	CenturyLink	2.40	0	20.00	20.00
8	Illinois	2012	0.45	0	0.55	3	Securus	4.10	0.87	0	30.31
9	Indiana	2010	0.22	0.67	0.11	3	PCS	4.05	0.40	0	14.02
10	Kentucky	2012	0	0.74	0.30	5	GTL	2.25	0.88	0	28.71
11	Kentucky	2017	0	0.86	0.14	3	GTL	1.65	0.50	0	13.66
12	Maine	2015	0.15	0.70	0.15	4	Legacy	1.65	0.55	0	15.03
13	Massachusetts	2013	0	0.86	0.14	6	GTL	2.36	0.6	0	20.14
14	Michigan	2018	0	1.00	0	3	GTL	2.40	0	23.65	23.65
15	Minnesota	2005	0	0.84	0.16	4	MCI	1.75	0.49	0	13.92
16	Minnesota	2016	0.40	0.60	0	8	GTL	0.33	0.47	0	3.27
17	Minnesota	2019	0.30	0.70	0	4	GTL	0.33	0.40	0	2.76
18	Missouri	2000	0.75	0.25	0	2	MCI	1.30	0	0	0
19	Missouri	2006	0.52	0.48	0	5	PCS	2.50	0	0	0
20	Missouri	2011	0.42	0.58	0	10	Securus	1.75	0	0	0
21	Missouri	2018	0.28	0.72	0	3	Securus	0.75	0	0	0
22	Montana	2017	0.20	0.80	0	5	CenturyLink	0.54	0	9.24	9.24
23	Nebraska	2008	0.33	0.67	0	6	PCS	0.70	0	0	0
24	Nebraska	2016	0.41	0.59	0	6	GTL	0.19	0	0	0
25	New Hampshire	2013	1.00	0	0	4	IC Solutions	0.65	0.20	9.67	12.26
26	New Hampshire	2018	0.35	0.65	0	4	GTL	0.19	0.20	11.12	11.95
27	New Jersey	2014	0.40	0.60	0	2	GTL	0.40	0	0	0
28	North Dakota	2016	0.23	0.68	0.09	5	Securus	1.19	0.25	0	5.36
29	Oklahoma	2018	0.30	0.70	0	4	Securus	1.91	0	14.57	14.57
30	Utah	2014	0	0.70	0.30	4	CenturyLink	2.10	0.90	0	28.50
31	Utah	2019	0	0.70	0.30	4	GTL	1.80	0.95	0	27.48
32	Vermont	2010	0	0.70	0.30	5	PCS	2.30	0.37	0	12.27
33	Vermont	2016	0.03	0.95	0.02	3	GTL	0.58	0.41	0	4.77
34	Virginia	2005	0.20	0.70	0.10	2	MCI	5.55	0.41	0	8.44
35	West Virginia	2014	0.30	0.70	0	3	CenturyLink	0.48	0	0	0.01
36	Wisconsin	2008	0.30	0.70	0	6	Embarq	1.05	0.30	0	5.84
37	Wisconsin	2018	0.20	0.80	0	3	CenturyLink	0.17	0.30	0	1.11

Notes: The table summarizes the auction-level data. Rate is the cost of a 15-minute local, collect phone call. The commission percentage is the percentage of the non-fee revenue that the provider pays to the state. The fixed commission the fixed amount of money that the provider pays to the state, converted to be in dollars per inmate-month. The total commission combines these two forms of payments and is in dollars per inmate-month.
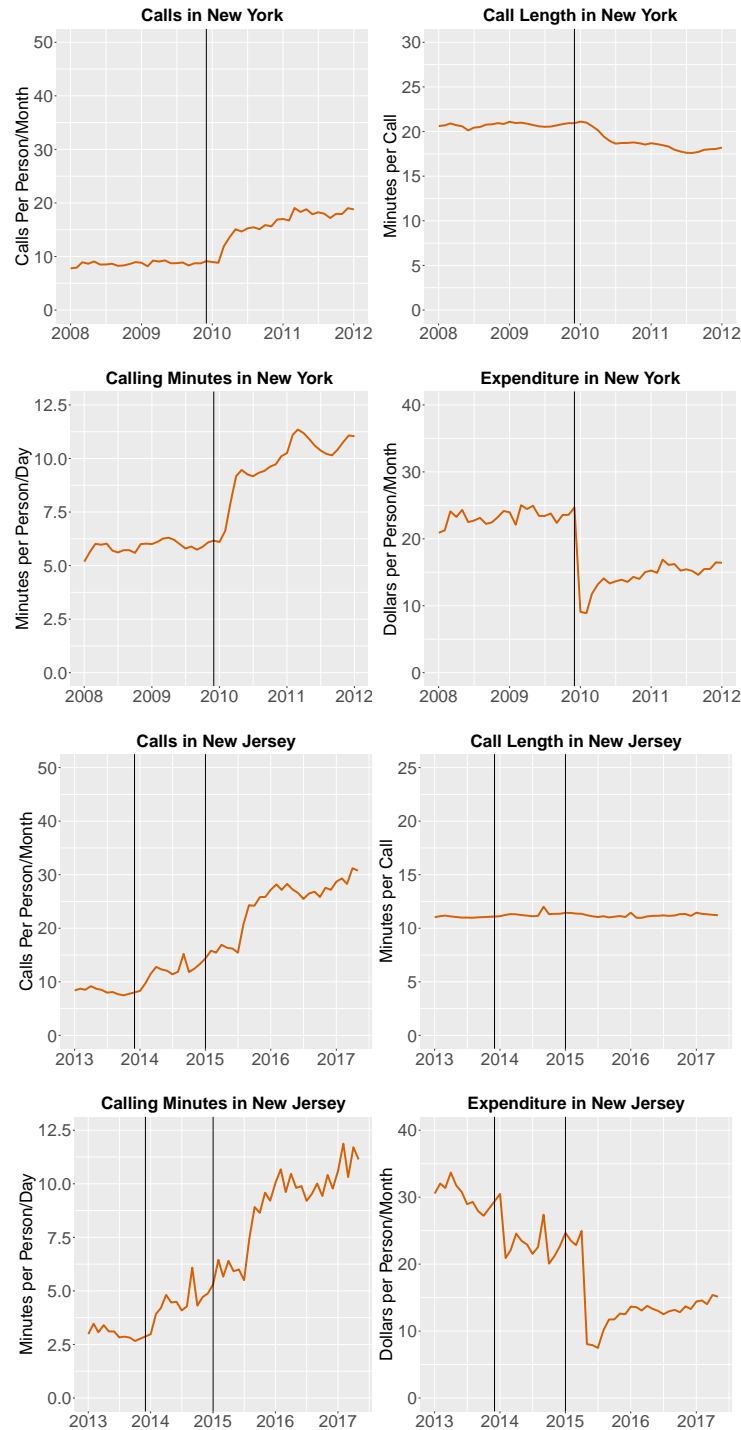
Figure A.1: Calling Patterns Before and After Price Reductions

Notes: The figure plots calls per person/month, minutes per call, minutes per person/day, and expenditure per person/month over time in New York (top four panels) and New Jersey (bottom four panels). The data points are monthly averages. The vertical black lines show the timing of price changes.