THE *REAL* STATE: INSIDE THE CONGO'S TRAFFIC POLICE AGENCY[*]

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Abstract: We analyze the organization of corruption in a state agency. The dual mandate of the Democratic Republic of the Congo's traffic police agency is to manage traffic and to enforce the traffic code. We first document that, in the capital's branch, Kinshasa, traffic violation fines account for only 22% of the revenue of the branch. The remaining 78%, unofficial, comes from bribes paid by drivers, of which 63% is generated through a "*quota scheme*:" managers at police stations ask agents posted at street intersections to escort drivers to the stations, where the managers extract a bribe from the drivers. Experimentally decreasing the quota, hence mitigating its effect, we find that the quota scheme worsens the agency's ability to fulfill its first mandate, while not improving its ability to fulfill the second. First, the quota causes 65% of all traffic jams and almost all accidents at the branch's intersections. Second, we find evidence suggesting that it fuels false allegations against drivers—*extortion*—at a higher rate than it fuels true ones, consistent with the scheme not creating incentives to comply with the code. The findings emphasize that the manager's demand for unofficial revenue is significant and creates profits and distortions beyond those that would be made possible via corruption by individual state officials.

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1. Introduction

There is now a growing literature seeking solutions to strengthen state capabilities in states considered too weak to provide basic services (IGC, 2021). Inspired by Weberian conceptions of the state as a centralized unitary actor defined through its official norms (Weber, 1946), much of this effort has focused on improving the state's ability to perform on its official prerogatives.

However, a large qualitative literature in political anthropology has argued that there is a systematic discrepancy between such official norms and the actual state practices—*real* governance (Migdal and Schlichte, 2005, Lund, 2006, De Sardan, 2008, Hagmann and Péclard, 2010). This distinction is particularly important in purportedly weak states: with a weak official resource base, resource generation is to a large extent organized by state officials and their managers along unofficial lines within state agencies—both to finance the private income of state officials and service delivery (Titeca and de Herdt, 2011, De Sardan and Herdt, 2015). Often taking the form of systemic *corruption* from the Weberian state's view, this *real* but unofficial state can interfere with attempts to strengthen official state capabilities. A challenge to study the economic organization of the *real* state is that these arrangements are essentially illegal. Thus, there is no data to date allowing to paint a complete picture of how even one of these systems operates.

In this paper, drawing on unique access built over three years of qualitative work, we analyze the economic organization of the real state in a specific agency—the traffic police agency of the Democratic Republic of the Congo (DRC)'s capital Kinshasa in 2015—to answer the following questions. How do the officials organize unofficial revenue generation? What share of revenue is generated through such organization? Does its existence as a system create social costs or benefits above those which would be created by independent unofficial practices?

Kinshasa's branch of the traffic police agency in 2015 was suited to answer those questions. First, the official dual mandate of the agency was to manage traffic flows in order to prevent congestion, and to issue official charges to drivers who violate the traffic code. Police commanders at police stations (henceforth, *managers*) deployed police officers (henceforth, *agents*) to the intersections in teams to manage traffic, and to escort drivers who violated the code to the police station, so that the managers could issue a charge. Unofficially, drivers paid bribes to the agents in the street through a system of toll fees to avoid being escorted, and to the managers in the police station to avoid being charged. These payments, henceforth corruption, were considered unofficial revenue (i.e., does not add to the public revenue of the state), in contrast to fine revenue, collected by the fine collection agency upon the managers issuing a charge, which was considered official (i.e., it does add to public revenue). Second, manager-agent unofficial revenue generation hinged on a "*quota scheme*." Each day, the managers ordered the teams to escort a number of drivers to the police station so that managers themselves could extract bribes directly from the drivers (Baaz and Olsson, 2011). Sometimes, managers relied on forged evidence that the driver committed an infraction—*extortion*. Escorts involved time waste and were hence a failure of a Coasean bargain between escorted drivers and the agents. There are various reasons why the actors may have chosen the quota scheme to generate bribes. Explanations provided during our qualitative interviews included that many private drivers had no liquidity, that public transport drivers had share-cropping contracts with vehicle owners where driver reports of bribe payment were not credible—typically, the vehicle owner, rather than the driver, was summoned to the police station to negotiate with the police—and that managers internalized that agents taking large bribes in the street risked arrest by other authorities. Finally, relationships we had built over three years of qualitative research with insiders allowed us to observe those schemes and to experimentally reduce the level of the quota, thus to provide a snapshot into the system and analyze how the manager's demand for unofficial revenue affected traffic and enforcement.

The first key input into our analysis is a unique dataset of 13,254 police agent/driver interactions observed at the intersections, 3,345 manager/driver interactions observed inside the police stations, 2,997 hourly observations of traffic outcomes at the intersections and 327 team of agents-day quota level agreements, covering half of one of the two battalions of the traffic police agency with jurisdiction over half of Kinshasa. To construct this dataset, we conducted six independent data collection operations in 2015. Some operations involved directly observing the schemes, and others leveraged trust relations we had established over three years of qualitative work. We worked with one hundred sixty individuals to record all transactions at the bottom of the hierarchy between drivers and agents; the quota schemes; the details of all transactions that occurred inside police stations; the properties of public service in real time; and the schemes developed between managers and higher-level officials. To gather this data, we collaborated with employees of the Traffic Police and of the Fine Collection Agency, the Division of Transports, National Drivers' Association members, and civilians. Since some of our collaborators were participants in the battalion, we know that the individuals whose behavior we recorded were not aware that their behavior was being recorded. We provide a detailed description of data collection in Section 3 and of the ethics of data collection in Supplemental Ethics Appendix.

Using these unique data, we first document the magnitude and significance of the corruption system inside the agency. The manager's demand for bribes through the quota scheme is the pillar of pervasive corruption. Each day, each police station requests 18.59 vehicles on average through the quota for each team of agents, and the agents escort 17.55 drivers on average. Of those, 11.06 drivers pay a bribe to managers on the same day, 1.84 pay a fine on the same day, and the remaining 5.65 resolve their case on a later day. The average bribe is 20.35 USD, while the average fine is 45.68 USD. 44% of 2,252 records with alleged infractions involved accusations of committing an infraction verifiable by a third party (e.g., does not own a driving licence). 56% involved accusations of committing an unverifiable one (e.g., dangerous maneuver). Police station bribes are determined by the power of the driver's "*protector*," a high-ranked official who the drivers call during the negotiation. 23% of the escorted drivers have one. Having a protector is associated with: a 13pp. (18%) lower propensity to pay a bribe in the station; a 9 USD (38%) lower level of the bribes; and a 5pp. (38%) lower propensity to pay a fine. Taxi drivers are three times less likely to have a protector than the other drivers; they also pay the highest bribes.

As a result of this system, officially, each station yields, on average, 2,995.30 USD of fine revenue every month. Fine revenue, however, is only 22% of their total revenue: unofficially, each station yields on average 12,118.07 USD in bribe revenue monthly (the remaining 78% of total revenue), of which 4,450.88 (37%) is from bribes drivers pay in the street to the agents and 7,667.19 (63%) is from those they pay in the station to the managers. The mean unofficial income of a police station staff member was at least 2,572.11 USD monthly, i.e. 13 and 37 times the wage of a teacher (Brandt, 2013), and of the manager, respectively, in 2015.

The second key input into our analysis is a randomized experiment that we designed to analyze the social cost of the scheme. Within team of agents' strata, in randomly selected days, we encouraged the corresponding team's manager to request a quota from the team that was at most half the mean level for that team (henceforth, the *quota reduction encouragement*). This generates random variation in the manager's demand for unofficial revenue through the quota, allowing us to compare public service under current system vs. that with agent corruption alone. We use this experiment to analyze the social cost of manager-organized corruption.

To guide the analysis of the social cost of the quota, we present a simple multi-tasking problem with a manager. The agent obtains an exogenous stream of bribes, and allocates their time between managing traffic and detaining drivers. The manager sets the agent's effort to detain drivers (the quota). The agent chooses their effort to manage traffic, which is unobserved by the manager. The simple model provides conditions under which the quota scheme undermines the ability of the agency to perform its first and second mandates. If the cross partial of the agent's cost function is positive, a higher quota reduces traffic management. And if the manager's power to charge by forging evidence (i.e., extortion) is large, it *also* reduces the agency's impact on enforcement. Specifically, extortion incentivizes the manager to order the agent to target drivers who would yield a high bribe if they are charged (henceforth, *high-bribe*). If the fraction of high-bribe drivers who did not violate the code is high, the quota reduces the drivers' cost to violate the code. We use the experimental decrease in the quota to analyze these two predictions.

First, we analyze the effect of the quota on traffic outcomes at the corresponding intersections. We find that the quota scheme causes a significant reduction in road safety and an increase in congestion. Our estimates imply that the quota causes close to all accidents and 65% of all traffic jams at the intersections. Using reasonable assumptions for the drivers' opportunity cost of time and the private cost of an accident, we find that the quota results in a significant social cost.

While we are unable to disentangle whether the effect of the quota on traffic outcomes arises through the direct effects of attempting to escort drivers (such as blocking traffic and creating risk) or through its effect on agent absenteeism, we document the ways in which the quota causes a change in agent behavior. The quota leads agents to attempt to escort more drivers, leading to more actual escorts. This effect is also present during rush hours, precisely when the agent's behavior is most likely to cause congestion. The quota also leads agents to spend more time away escorting drivers, *especially* during rush hours. The rush hours are also precisely when the quota has the largest effect on *congestion*. This pattern is consistent with the quota causing accidents and congestion through its effect on the agents' attempts to escort and agent absenteeism.

Second, we analyze whether the quota, by increasing the number of drivers who pay a bribe or a fine, alters the incentives of drivers to comply with the code. We first document that the quota predominantly induces escorts of the drivers expected to be high bribe: we find that it essentially only induces more escorts of taxis and unprotected drivers and, overall, of drivers whose observable characteristics predict highest bribe payments, as predicted by a Lasso prediction model. We then document that the quota disproportionately induces agents to produce allegations that are likely false. While, with the quota reduction *encouragement*, 54% of alleged infractions are unverifiable by a third party, a one-unit increase in the quota increases their number six times more than that of verifiable ones. The effect on the latter is not statistically significant, even controlling for driver characteristics. Since unverifiable allegations may have characteristics other than being false, this increase may reflect that the quota leads agents to target drivers who have committed infractions with specific characteristics that also tend to be unverifiable rather than false. To complement this analysis, we also analyzed open-ended answers by the street observers describing the 13,254 driver-agent interactions. We find that the quota causes an increase in allegations the observers described as *false*. This suggests that the quota increases false allegations, but not true ones, confirming the FCA agents' description of the system as based on "*fantasy arrests*." While the magnitude of its effect on safety depends on the drivers' response to the cost of violating the code, this suggests that, in addition to its effect on traffic outcomes, the quota does not improve safety through its effect on the drivers incentives to comply, that is, the quota is socially costly, *on net*.

Finally, we show that managers use the quota scheme for the creation and maximization of unofficial revenue. Specifically, we document that the quota increases revenue from bribes paid in the police stations by increasing the number of bribes paid. It does not increase fine revenue. This suggests that managers use the quota to increase their unofficial revenue, not to raise fines. Furthermore, reducing the quota level from its equilibrium level decreases *total* corruption revenue, and does not lead to higher bribe collection by the agents. We interpret this result as suggesting that the quota does not reflect contracting frictions between the manager and the agents: given that escorted drivers are unable to pay agents to avoid being escorted, the agency uses the quota to maximize corruption surplus. We conclude discussing how the social costs of manager corruption would have differed had the managers used other tools.

There is considerable research in economics on strategies to increase state effectiveness in states with purportedly low capabilities. Existing research has analyzed how improvements on the margins of the official attributes of the state, such as introducing, outsourcing, or reducing statutory sources of the state official revenue or extending formal contracting can improve the ability of the state to provide public goods (Weigel, 2020, Balan, Bergeron, Tourek, and Weigel, 2021, Bergeron, Tourek, and Weigel, 2021, Sánchez de la Sierra, 2021). However, there is now a large literature in political anthropology showing that, especially in states with purportedly low capabilities, there is a significant discrepancy between the official norms of the state and the actual practices of state officials, which make up "*real governance*" (Migdal and Schlichte, 2005, De Sardan, 2008, Hagmann and Péclard, 2010, Lund, 2006, De Sardan and Herdt, 2015). This discrepancy is central to what weak states do (Titeca and de Herdt, 2011) and and can undermine attempts to influence the official state practices and interpret their effects. Yet, the existence of these unofficial systems and their significance remain unstudied through the methods of economics. We document the organization and the scale of the real but unofficial system of revenue generation inside a state agency and quantify its social cost.

This paper also makes three contributions to the economics literature on corruption. First, this study documents the role of state officials' managers in corruption. Empirical studies of corruption have focused on the behavior of *individual* state officials (Bertrand, Djankov, Hanna, and Mullainathan, 2007, Olken and Barron, 2009, Sequeira and Djankov, 2014). Yet, studies in other disciplines (Wade, 1982) and in economic theory (Tirole, 1986, Dixit, 2012) have suggested that informal arrangements between managers and their agents are important. We showed that managers represent a central part of corruption and their involvement can create new, previously undocumented, social costs. The study presents the notion that systems of corruption with manager participation create costs and profits beyond those possible with individual corruption. Those costs are likely pervasive in low-income countries, where citizen liquidity constraints are prevalent, leading to second-best arrangements like the quota. Second, the paper documents a new type of social cost generated by corruption. Corruption has been shown to be costly because agencies can be uncoordinated, leading to sub-optimal pricing (Shleifer and Vishny, 1993, Olken and Barron, 2009), and because market incentives lead to mis-allocation of public goods (Banerjee, 1997, Bertrand, Djankov, Hanna, and Mullainathan, 2007, Olken, 2007, Banerjee, Mullainathan, and Hanna, 2012). We show that corruption causes accidents and congestion in the context of traffic management, a major public health hazard in most Sub-Saharan cities. Third, the paper also shows that corruption reduces the incentives to comply with the law, thus providing a second, indirect, channel through which it undermines public safety. This finding resonates with Fisman and Wang (2015), who found that firms' personal connections with politicians reduced incentives to comply and caused higher worker mortality. Our findings on the incentives to comply represent a first empirical step into the question of extortion by state officials. Corruption is especially socially costly if it is based on extortion, since extortion decreases the incentives to comply with the law. Despite theoretical work on the role of extortion in corruption (Khalil, Lawarrée, and Yun, 2010, Angelucci and Russo, 2016), there is, to the best of our knowledge, no empirical evidence documenting the presence of extortion, rather than corruption alone.

Our study also has implications for policy. First, as corruption is organised in a hierarchical manner through the manager, interventions aiming to influence corruption that focus only on the individual agents will fail to address the manager's incentive—precisely those which generate the costs we document. Although this conclusion is unambiguous and should be the focus of corruption policy, this is not the case. Our analysis suggests that paying off the manager, or even legalizing unofficial transfers from citizens to the managers rather than just to the agents would reduce manager demand for bribes and the associated social costs as we have shown—although the effects of such a system depend on whether the manager's income expectations adjust over time. Second, reducing the power of managers to forge evidence would significantly reduce the social costs of corruption. Indeed, this would ensure that bribes are paid primarily by citizens who violate the law, hence corruption would still contribute to making it costly for citizens to violate the law. Third, decoupling the tasks of state officials, which can be achieved, for instance, by introducing traffic infrastructure, would make the effect of corruption as a system less costly by mitigating the costs of effort substitution. Fourth, the findings suggest that the design of selective legalization that takes into account the system can reduce the social cost of the system—and leverage its benefits, such as its role at financing public service.

2. A Brief Description of the DRC's State and Kinshasa's Traffic Police Agency

Since the late 1970s, processes of state disintegration in sub-Saharan Africa have strongly impacted the capacity of public administrations. Administrations have suffered from material and technical under-resourcing, organisational deficits and a lack of funds to pay their civil servants. Public services have been severely diminished (Bierschenk (2010b): 7-8, Bates (2008), Van de Walle (2001)). With the working resources for civil servants seriously declined, civil servants had to "*fend for themselves*" by using their position to secure sources of revenue, a process which Blundo (2006): 805, describes as "*informal privatisation*." This process was particularly intense in the DRC (Titeca and Malukisa, 2018) and as such the DRC represents an archetypical weak state.

The DRC is widely seen as the "*paradigm of informalisation and criminalisation of the state and the economy*" (Petit and Mutambwa, 2005), fuelled by over 30 years of patrimonialism under ex-President Mobutu and six years of civil war. Callaghy (1987) described the Congolese state as a "*lame Leviathan*," which is simultaneously "*soft, yet highly coercive*." Its softness is promoted by patrimonialism and corruption "*such that the performance of key functions slowly declined and in some cases disappeared completely*," but continues to be controlled through the coercion afforded by its military, intelligence, and police branches. The disintegration of the DRC state has resulted in practices of clientelism and patronage (Nzongola-Ntalaja, 1986, Schatzberg, 1991, Boyle, 1995, Lemarchand, 2001, Young and Turner, 1985, Zartman, 1995). Ex-President Mobutu's famous quote "*Moto na moto abongisa*" or "*Let each person sort things out at his own level*" had a marked impact on public administration and society at large – it was "*ironically*" reinterpreted in relation to Mobutu's kleptocratic behaviour, as an invitation for "*each and every one to steal at his own level of responsibility*" (Petit and Mutambwa, 2005: 482). In the words of Lemarchand (1988), what happened was a privatisation of state positions. The state continued to hire civil servants but assumed that they would "*steal cleverly*" (Titeca and de Herdt, 2011). Although the state budget eventually increased over the years through the renewed engagement of donors throughout the 2000s (Titeca and de Herdt, 2011), these practices remained, termed by (Bierschenk, 2010a): 114, the "*capacity of legal command*." Nzeza Bilakila (2004) calls this "*la coop*" or the "*Kinshasa bargain*," such as a civil servant asking for "*something extra*," or someone trying to obtain a favour from a civil servant. In this situation, "*all the state's usual attributes have been influenced by informal privatisation . . . public officials . . . have taken over the customary functions and prerogatives of the state, selling their services to their 'customers'* " (Petit and Mutambwa, 2005): 467. Administrations were transformed into "*parcels of power*," in which "*each position in the administration provid[es] not only a wage, but also an opportunity for appropriation*" (De Herdt, 2015): 49.

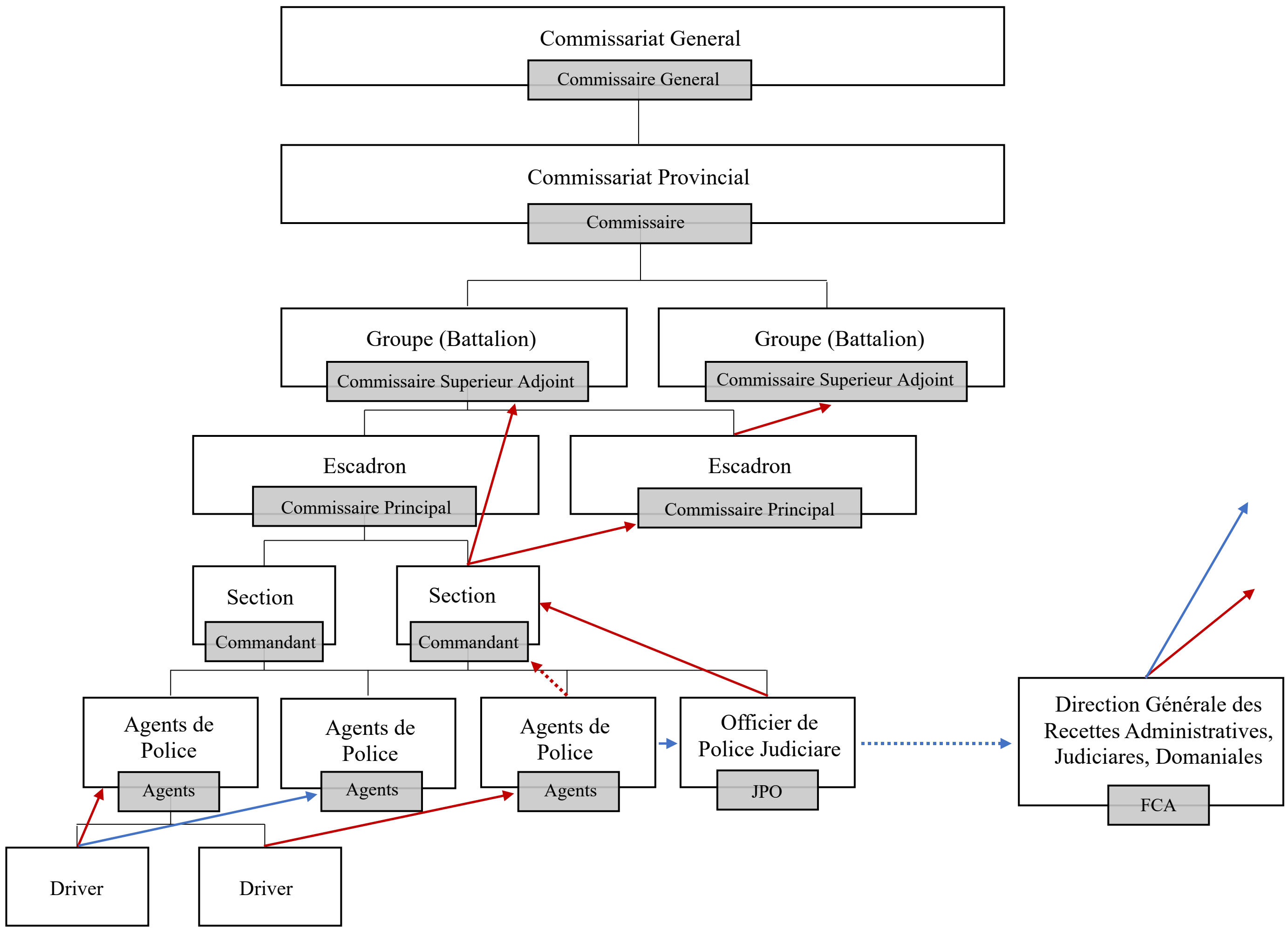
The traffic police agency is one of such administrations. It is one of the main agencies of the Congolese National Police, which was established by law in 2002.[1] Officially, the agency's mandate is to manage traffic flows, and to charge drivers who violate the traffic code, so that the drivers pay a fine. The official organizational structure is shown in Figure 1. In 2015, the Kinshasa branch was divided into two battalions, each led by a Commissary (*Commissaire Superieur Adjoint*, in French) and composed of 16 police stations, each of which were led by a commander (the *managers*). The monthly wages of the agents and managers were 69 USD and 103 USD, respectively. Each manager oversaw over 10 agents on average. Managers deployed agents, split into teams of four, to street intersections to manage traffic and act as witnesses of drivers' traffic code violations.[2] Specifically, the mandate of the agents was that, upon witnessing a possible infraction, the agents were to escort the driver to the police station for the driver to be charged. At the station, each manager was each assisted by two Judicial Police Officers (henceforth, *JPO*). Only the JPOs had the power to formally charge drivers.[3] Upon issuing a formal charge, the JPOs would send a citation to the Fine Collection Agency officials who were

[1]The DRC's road traffic death rate was in the top 10 worldwide in 2022 (World Health Organization, 2022).

[2]Figures A1 and A2 in the Online Appendix show a map of Kinshasa, and an intersection, respectively.

[3]The JPOs work for the Office of Public Prosecution, thus reporting to the Ministry of Justice.

Figure 1: Organizational Structure of the DRC's Traffic Police Agency



Notes: This figure presents the official organizational structure of the DRC's traffic police agency. Each manager (the commanders, *Commandant* in French) oversaw 10 *agents*, *Agents de Police* in French, on average. Managers deployed agents, split into teams of four, to street intersections to manage traffic and act as witnesses of drivers' traffic code violations. At the station, the managers were each assisted by two Judicial Police Officers (henceforth, *JPO*), *Officiers de Police Judiciaire* in French. Officially, upon producing a formal charge, the JPOs would send a citation to the Fine Collection Agency officials who were also located in the station (henceforth, *FCAs*), *Direction Generale des Recettes Administratives et Domaniales* in French. The FCAs would then issue a fine collection note, which the driver would pay at the bank in order to re-gain access to their vehicle. Blue arrows indicate the official process. Red arrows indicate the unofficial process. Dashed arrows indicate that the transaction is infrequent. White-background boxes indicate the hierarchical division in the traffic police agency's hierarchy. Gray boxes indicate the title of the person leading the corresponding division described in the attached white-background box.

also located in the station (henceforth, *FCAs*). The FCAs would then issue a fine collection note.

In practice, however, the agency was a "*profitable commercial enterprise*" fueled by extortion.[4] Managers had designed a scheme to generate unofficial revenue for their own consumption, and partly to finance the police station operating costs, the "*quota scheme*." It consisted in the following: the agents had to escort a pre-agreed number of drivers to their station every day, a "*quota*" ranging from 4 to 16 drivers per team of agents.[5] In exchange, the agents took bribes for themselves directly from drivers in the streets mostly through an informal toll fee called the *salute of the cola nut* ("mbote ya likasu," in Lingala).[6] The managers' power over their agents hinged on their ability to authorize the agent's activity in the street. One agent recounted:[7]

> *"The Colonel does not have the power to discharge an agent, as it is the general who is empowered to do so in collaboration with the Ministry of the Interior. But the commander can punish an agent. A police agent who is on the street at 8 o'clock and whose vest the commander withholds over the span of 3 or 4 hours will complain strongly. For an agent whose vest has been removed, his team leader asked me to plead at the level of the commander to let him work. The commander explained that this gentleman did not bring sufficient vehicles for a while. He didn't meet his quota."*

Key actors we interviewed described the quota as having a heavy impact at the intersections. To meet their quota, agents spent their time stopping drivers for alleged infractions (called *tracasseries* in this setting).[8] Since the traffic police agents were unarmed, getting a driver to the station often took time away from traffic flow management. To detain a driver, agents used lengthy negotiations, racketeering, and torture. It was common for agents to enter cars and confiscate keys, driving licenses, or radios.[9] "*Tracasseries*" were perceived by the drivers to target drivers vulnerable to extortion, with "weak" relationships. These were often taxi drivers.

[4] The quote's source is a conversation with one of the study's informants.

[5] In addition, agents made rare monetary payments to their commanders, called the "*retrocession*."

[6] The toll fee was 50 cents per crossing. Cola nut is used for embarrassing purposes in traditional medicine and often given in a hidden fashion. The name illustrates that the payment is concealed. See Figure A3 in the Online Appendix. In 2015, a minor share of bribes were paid to intermediaries such as retailers who then paid the police.

[7] Alternatively, the commander reassigns the agent to a so-called "sterile" intersection, where the agent will make less in bribe revenue. Another agent recounted: *"The Colonel gave me a particular intersection, for which he asked me to pay his brother-in-law, who is a Colonel, 500 USD per week, as this would guarantee me an easy life. The problem was that I was based at a sterile intersection: no cars were passing by! So I could no longer pay this amount, and I lost my position."*

[8] The Larousse dictionary defines tracasseries as "*bothering or difficulty caused to someone due to unimportant things*." It comes from the verb tracasser, "*to worry someone, cause them concern*." In old French, it is found as "*annoying petty demand*" and "*unnecessary fuss*," sometimes associated to the annoyance from administrative procedures. The term emerged ironically in the DRC to indicate harassment related to petty corruption, often based on dubbious claims.

[9] Figure A4 in the Online Appendix provides an example of a tracasserie interaction.

Once at the police station, the drivers escorted through the quota scheme would negotiate a bribe with the JPOs. The JPOs had the power to create charges based on reports made by the agents, which were regularly fabricated. For instance, a driver said: (**Source**: Radiookapi (2021))

> *"Officers...brutalize us, tear out our licence plates. We have a big problem. We are fed up. Too many tracasseries. After having seen all our documents, [they] invent imaginary infractions."*

That is, beneficiaries perceived the scheme to fuel extortion. Thus, many tried to establish protection relationships with powerful officials rather than complying with the traffic code.[10]

The bribes paid by drivers inside the stations were distributed amongst the JPOs and the managers. Police station managers were residual claimants of their police station and paid unofficial fees to officials higher in the hierarchy to retain their position at the police station.[11]

3. Constructing A Database of The Real State Inside the Agency

The first key input into our analysis is a dataset documenting the organization and scale of the unofficial system of revenue inside the traffic police agency of Kinshasa in 2015.

A. *Sample*

The sample consists in the details of 13,254 police-agent/driver interactions observed at the intersections, the properties of 3,345 JPO/driver interactions observed inside the police stations, 2,997 hourly observations of traffic at the intersections, and 337 team/intersection-day data points of quota schemes' levels and payments from agents to commanders (which are rare). We refer to this sample, which covers 18 intersections (and for some variables, up to 61 intersections) from June 19$^{\text{th}}$ through July 20$^{\text{th}}$ 2015, as the *observational sample*. The observational sample consists in 352 team of agents/intersection-days (and for some variables, 620 intersection-days).[12]

[10]The following encounter, described by various observers, illustrates the importance of protection relationships: *"The agent and a soldier who owned a motorbike quarreled over the motorbike. The soldier said, 'tomorrow you'll see what I do; I will come back!' The soldier came today with a jeep, heavily armed. They arrested the agent. They threw him in the jeep in front of everyone! The other agent wanted to intervene. The soldiers said: if you intervene, we will shoot; they were almost going to shoot! The soldiers left with the agent, and they are going to beat him up."*

[11]One manager recounted: *"In order to earn money easily, you need an 'umbrella,' an officer in a higher place to which you give an envelope in such a way that he protects you, in case you are accused."*

[12]The sample focuses on half of the police stations' jurisdictions in one of the two battalions of Kinshasa. The battalion covered approximately 36 intersections and operations were ran by 32 commanders from 16 police stations and covered the most populated side of Kinshasa. We chose this sample because we had built relationships in the three years preceding the study, which made our study feasible. This sample represents more than half of the revenue in the battalion we study. In the descriptive analysis, we provide a range of the unofficial revenues generated by the battalion, based on different assumptions about the relative size of the rest of the battalion.

B. *Variable Description*

The dataset contains detailed information about:

a. the drivers escorted to each police station (n=3,345). We observe their hour of arrival at the station, the intersection from which they were escorted, the type of vehicle they drove (taxi, minibus, private car, jeep, motorbike, being the most common), the exact make of the vehicle, the first request for a bribe made by the JPO, whether the driver placed an intervention call to a protector, the military rank and state agency of the protector when there was one, the actual bribe payment made, the fines drivers paid to the FCA agents in the police station, as well as whether their case was resolved. The dataset includes handwritten, open-ended descriptions of the infractions that the agents accused drivers of committing. In addition, we obtained handwritten information detailing the conversations in the station;

b. the quotas requested for 347 team of agents-days (of which, 10 observations are missing);

c. the 13,254 drivers' interactions with agents at intersections. We observe the timestamp of the interaction, the agent's identifier, the intersection, the type of vehicle, the duration, and the type of interaction: whether it is a bribe related to a tracasserie interaction, a toll fee (mbote ya likasu), a tip (voluntary contribution), an escort to the police station, or a conversation with no payment nor escort. Each interaction is also described in an open-ended field.

e. the amount of time that passes between the time an agent left with a driver to the police station for an escort and the timestamp of his next interaction at the street intersection.

f. traffic properties at each intersection for each working hour (n=2,997). We observe whether there was a traffic jam or not, the number of accidents, and assessments for the number and average speed of vehicles crossing the intersection in the last minute of the hour.[13]

C. *Data Collection*

To construct this dataset, we implemented multiple data collection operations inside one battalion in 2015. We worked with multiple individuals during three years of qualitative work and six months of preparation, and specifically worked with one hundred sixty individuals from June 19$^{\text{th}}$ through July 20$^{\text{th}}$ to gather the data.[14] For each component, we obtained authorization from the relevant local authority. Figure 2 presents the data collection system.

[13] The dataset is complemented by hundreds of pages of supervision meeting notes that took place thrice a day.

[14] We dropped two intersections in the course of the study and decided not to work with the other battalion. We did not observe any incidents that harmed the safety of our team or of the subjects. This was the outcome of intensive management on the part of the authors.

To obtain data on transactions that occur inside the police stations, we created two data collection branches and developed a strategy to verify the data being collected. First, in each station, we worked with the two corresponding JPOs. The JPOs wrote down all of the information detailed above on a paper sheet that we created for them and trained them to use. They received compensation for their work collecting the data.[15] To supervise the JPOs, we hired two JPO data collection supervisors.[16] The JPO data collection supervisors met every evening with the JPOs to recover forms and provide feedback.[17] The JPO data collection supervisors were supervised by one of the authors acting as the scientific coordinator.[18]

Second, as an independent source on these outcomes, we designed a separate study branch. Leveraging the relationships we had built over three years, we obtained the Fine Collection Agency's approval for working with the FCAs inside all of the police stations in the battalion.[19] This agency is separate from the police networks, thus minimizing risks of collusion with the JPOs, whose behavior they would observe and report on.[20] The FCA agents completed the same form as the JPOs.[21] To supervise the work of these agents, in collaboration with the FCA agency, we worked with supervisors working from inside the Fine Collection Agency. The FCA supervisor collected the form every evening near the police stations, and provided feedback from previous days. The FCAs and JPOs did not know that each other were providing reports.[22]

[15]Since we cannot work with the JPOs without the approval of the corresponding police station commanders, between January and May 2015, we worked separately with all commanders of the battalion to design the scope of the collaboration and to ensure that we obtained their approval.

[16]These supervisors had worked with the police, and were familiar with the JPOs, hence were able to interact with police officers without generating suspicion. This ensured that we raised no suspicions among the JPOs, and that their interactions with the JPOs were mindful of the norms of this community.

[17]The JPO data collection supervisors brought the data to the coordinator each night. The next day, two data entry clerks entered the data in tablets, and uploaded it to a server. Each day, the JPO data collection supervisors provided data quality feedback to the JPOs with a two-day lag.

[18]The scientific coordinator was flown in from a different part of the country to ensure they had no prior established relationships with the rest of the team, thereby further decreasing the risk of collusion.

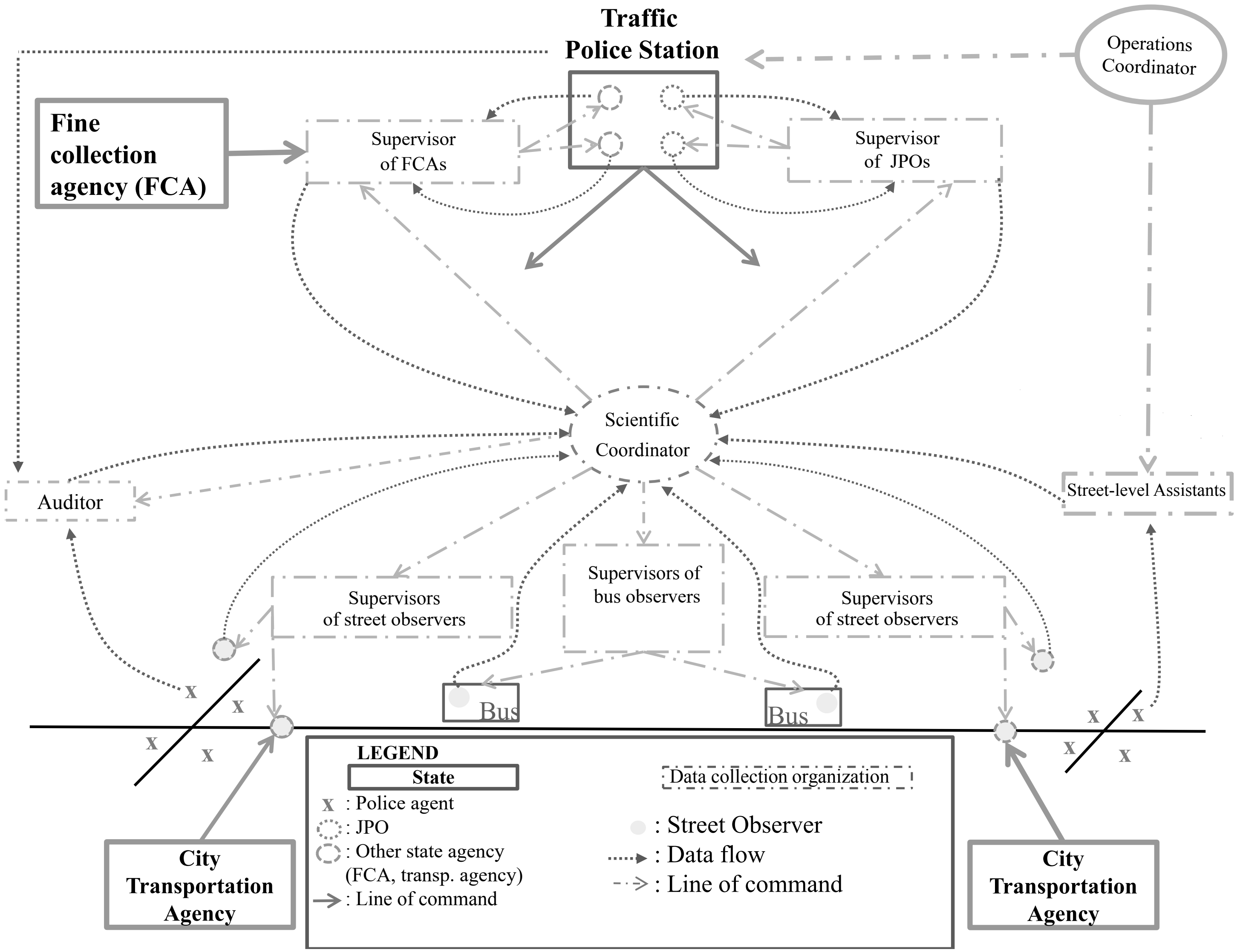
[19]The FCAs were thus working to gather information on the JPOs' behavior.

[20]Indeed, our qualitative work between January and May 2015 indicated that they did not collude with the police networks. One explanation given was that the FCA agency has weak power. Hence, if they were to use the threat of reporting police rent-seeking in order to obtain a bribe, they would not be effective in obtaining a cut. We were told that this is because the higher-level networks of the FCA are much weaker, whereas JPOs can activate powerful networks within the Ministry of Justice if they are unhappy with a given allocation. However, FCA agents have an arrangement with the police station to determine how many drivers should be sent to the FCA to actually pay fines, rather than being kept by the JPOs for bribe-taking. These arrangements are often the result of pressure from higher levels of the FCA and the police agency. We obtained access to one letter from the top of the police hierarchy reminding the JPOs to send at least some drivers to the FCA to pay fines.

[21]However, they were trained to do so on blank paper to avoid being noticed. Since there is no taboo concerning fines, we are confident that the FCA agents had no incentive to misreport this component. A police station is small, making it straightforward for FCA agents to observe and listen to all conversations with drivers. Negotiations with drivers operate like a tribunal, where the JPO is analogous to the judge.

[22]Figure A5 in the Online Appendix shows typical police stations of Kinshasa's traffic police agency.

Figure 2: Data Collection System



Notes: This figure presents the data collection system. For presentation purposes, it only shows the system for one typical police station. JPO stands for Judicial Police Officer (*Officer de Police Judiciaire* in French) and FCA stands for Fine Collection Agency (DGRAD, Division Generale des Recettes Administratives et Domaniales in French).

To verify and correct the JPOs reports, in each station, we also obtained an accounting of all bribes paid in the station. This was used by the JPOs and the managers to allocate bribe revenues. The JPO data collection supervisors used this source each evening to correct their JPO forms:

> *"The JPOs give us the register of bribes collected at the station. They have a register in which they keep the cars for the FCA agents; but they also have a single paper on which they have written the true entries. They show us the register every day. This register is for the commander, to show what is sent to the FCA agent and what is for the police. We can not copy this register, but we use it to see if the data of the JPO is correct. Since about the 27th of June, we have access."* **Source**: Notes from an evening data collection supervisors meeting.

We kept scanned copies of these two sources as archives. In the five years after data collection, we re-entered all the data from JPO and FCA reports and their handwritten notes as verification.[23]

To measure the quota scheme agreements by team and by day, we created seven independent data collection sources. We worked with the JPOs inside the police stations with the authorization of the commanders and with a manager of JPOs from informal police networks, who reported their the true quota levels' estimates based on their conversations inside the station; we worked with the FCAs inside the police stations and with an intern we hired from our networks within the FCA; we also trained the auditor to interact with the agents on a daily basis. In addition, all research staff held a daily meeting in which they discussed the quota level based on the information they gathered from all the points of contact they had with batallion participants in the day.[24] Of all data collection operations, commanders were only aware of the JPOs'.

To measure the behavior of agents at street intersections, we hired 30 observers from the Division of Transport and deployed them to each intersection. Each observer was tasked with following one target agent for the day.[25] The street-level observers operated from corners of

[23]In Supplemental Study Documentation, Section 1, we detail how we aggregated police station sources. The results that we present in this article are not sensitive to the aggregation algorithm. There are 32% of cases unresolved at the end of the day. For some of those cases, we do not have information in our forms for the subsequent days on what the outcome was. In the econometric analysis that follows, unresolved cases are dropped as missing. However, we use imputation for those cases in the descriptive statistics of Table 1, to present an estimate of total bribe payments.

[24]Supplemental Study Documentation, Section 2, presents the algorithms used to aggregate the quota level sources.

[25]Before the project, we drew a roster of agents/intersections, which we used to instruct each observer on who to follow. Observing the agents is straightforward: agents are required to wear an orange jacket and a helmet, which display their identifiers. Each observer was given a randomly selected target for the day. If the target was absent, the observer replaced them with a randomly selected agent at the intersection and indicated that they were a replacement. As soon as the target was present, the observer returned to recording the target. While the replacement provides rich data on life at the intersections, our analysis uses only data from the targets, since the agents available for replacement are not a random sample. Supplemental Study Documentation, Section 3, describes the selection of agents, how we aggregated the target data to construct an estimate of team-level outcomes and presence, and the variable definitions.

the intersections where the street observers could not easily be seen, and where they would be surrounded by various actors operating at the intersections (e.g., phone credit and currency sellers), making their presence non-intrusive. This operation was conducted discretely to avoid influencing the agents and for the observers' own protection.[26]

To record traffic properties, observers completed a questionnaire every hour, answering the following questions concerning the intersection over the previous hour: a. whether there were traffic jams or not; b. whether there was an accident.

To measure monetary transfers from the agents to their commanders (the retrocession), we hired two individuals who had worked with police-officers before, and thus who, at the time of the study, could interact with the agents without suspicion (henceforth, *street-level* assistants).[27]

Given the ethical challenges that we had to consider when designing the data collection, each operation was designed attentive to questions concerning the ethics of data collection, the potential harms to subjects, research staff, and others arising from our data collection. The Supplemental Ethics Appendix, Section 5, discusses these issues in detail.

The operations included a monitoring structure to minimize misreporting. Each source included observers who had previously informally interacted with the police or the policemen themselves, and observers from the East or from other state agencies. To prevent collusion, each research supervisor was from a different network than those they supervised. The JPO branch was the only component that commanders, JPOs or agents were aware of.[28]

4. The Real Fiscal Revenues of the Traffic Police Agency

We first use this data to describe the "*black box of corruption*" (Bertrand, Djankov, Hanna, and Mullainathan, 2007) inside this agency, and document the magnitude of the system's components.

The typical agent is 42 years old, is married, and has 5 children, 16% are female, and 62% have finished secondary education.[29] Agents are from various socio-linguistic groups, but

[26]The operation was designed to address challenges arising from security and observer incentives. First, we worked with observers from inside the Division of Transports of the city, which is separate from the police. Second, observers were constantly monitored by managers positioned at the intersections without being seen by the observers. To achieve that, we hired three managers from networks from other parts of the country who circulated through their allocated intersections every day. The observers knew about this monitoring, and this affected their behavior. Third, the observers were randomly re-assigned to different intersections every day, and the assignment was not known to them. See Supplemental Study Documentation, Section 4 for details of the design of this data collection component.

[27]We obtained the permission of the battalion commander, who introduced them to the staff in a meeting.

[28]See Supplemental Study Documentation, Section 5 for a description of the data collection management details.

[29]The data in this paragraph is based on two surveys conducted after the study was complete to prevent contamination. Table A1 in the Online Appendix presents the descriptive statistics of police staff.

commanders are mostly from the East of the country. The average tenure in the traffic police agency was almost 10 years for agents, and almost 8 years for police station staff.[30]

Each police station has 7.5 agents in the street on average.[31] Agents are seen at their intersection during 87% of the working hours. Each agent conducts 18.93 transactions with a driver per day on average, of which 16.12 are bribe payments from the drivers. Averaging across police stations, the agents associated with one police station conduct 229 interactions per day with drivers on average. Of those, 137 are events in which a driver pays the *mbote-ya-likasu*, the toll fee, amounting to 50 cents (for public transport drivers) and 1 USD (for transport of goods). The remaining are 47 voluntary contribution payments and 45 tracasserie events, among which 30 are escorts of drivers to the police station. Most interactions with drivers are between 8 am and 5 pm.[32] These transactions amount to a daily and a monthly bribe revenue per agent of 13.25 USD and 344.5 USD, respectively. The bribes paid by drivers to the agents in the street intersections amount to 4,450.88 USD monthly, for all agents assigned to a particular police station.[33] A small fraction of this unofficial income is then transferred through (rare) payments made by the agents to their commander (the "*retrocession*"). The monthly average retrocession revenue paid by the all staff associated with one police station is 143.53 USD.

Overall, there is a significantly high number of accidents and a high rate of traffic congestion at the intersections managed by the agents.[34] There are, on average, .8 accidents per day per intersection. Accidents are twice as likely to occur outside of rush hour when vehicles are driving faster, although the difference is not statistically significant.[35] On average, a traffic jam is recorded in 1.5 hour blocks daily per intersection. The frequency of traffic jams is three times larger during the rush hours than during the rest of the hours, and the difference is statistically significant.[36]

[30]Most commanders report to have been appointed through unofficial procedures by higher-ranked officials in the national police and military hierarchy 2 years prior to our study as a result of city police reforms, but agents, and especially JPOs, typically report follow official processes to obtain their job (which includes training and professional degrees), sometimes with the help of a powerful official.

[31]In this paragraph, agent-level statistics are estimated from the street-observers source.

[32]**Source**: Figure A6 in the Online Appendix. We include all intersection-days in the study.

[33]**Source**: Table 1, Panel E.

[34]Figure A7 in the Online Appendix shows the daily occurrence accidents and traffic jams per intersection.

[35]The rush hour in Kinshasa, which typically takes place starting at 4 pm, is associated with frequent congestion. Figure A8 in the Online Appendix replicates Figure A7 using different rush hour cutoffs.

[36]To examine our measurement of traffic jams, we present the relationship between the indicator for whether at least one observer at the intersection reported a traffic jam in a given hour block, and the number of vehicles at the intersection in the last minute of that hour and the average speed of the vehicles in the last minute of that hour in Figure A9 in the Online Appendix, Panels A and B, respectively. A traffic jam is associated with twice as many vehicles, and to vehicles moving at half the speed than without a traffic jam. Furthermore, if one observer reports a traffic jam, it is significantly less likely that any other observer at the same intersection reports traffic to be fluid.

The quota scheme generates profits as follows. The average quota level for one team of four agents is 6.5 vehicles. This amounts to each police station requesting 18.59 vehicles on average through the quotas across all team of agents deployed across intersections.[37] If the JPO issues a citation, he transfers the file to the FCAs in the station. Alternatively, the JPO and driver could negotiate a bribe paid by the driver to the JPO inside the police station, in exchange for the JPO dropping the charge. The negotiation between the driver and the JPOs over whether the JPOs will issue an official citation and the level of the bribe includes the so-called "*intervention*," in which the driver calls a "*protector*" to plea on behalf of the driver with the JPO. In practice, the protector threatens the JPO and asks them to reduce the bribe and to avoid issuing a citation.[38]

Figure 3, Panel A, presents the characteristics of the steps of the quota scheme negotiation between the driver and the JPO. The mean initial bribe requested by the JPO prior to the intervention is 68 USD for unprotected drivers, and 62 USD for protected drivers ("Initial Request (bribe)"). While 71% of unprotected drivers end up paying a bribe, only 58% of the rest do, and the difference is significant ("Actual Bribe (share pays)"). Among the drivers who do pay a bribe, the mean bribe for unprotected drivers is 24 USD, compared to 15 USD for protected drivers and this difference is also significant with a p-value of 0.01 ("Actual Bribe (USD, if pays)"). While 13% of unprotected drivers pay a fine, only 8% of the protected drivers do ("Actual Fine (share pays)"). In contrast, for drivers sent to the FCA for the fine payment, the mean fine is 48 USD and is indistinguishable for protected and unprotected drivers ("Actual Fine (USD, if pays)"). This suggests that having a protector is associated with a lower bribe revenue for the police.[39]

Taxi drivers are most likely not to be protected, and consequently, they are also quite profitable for the police. Figure 3, Panel B, shows the fraction of drivers who are protected. While only 13% of taxi drivers are protected, 27% of non-taxi drivers are protected, and the difference is statistically significant. A taxi driver is more likely to pay a bribe than a non-taxi driver.[40]

[37]Figure A10 in the Online Appendix reports the distribution of the quota level. Observers at the intersections reported 7.47 escorts to the police station on average per intersection day. Police station observers reported 7.98 escorts from the corresponding intersection, on average, per day. This is consistent with our qualitative interviews which suggest that some escorts were made to other police stations, for instance, in the cases in which an agent was temporarily operating outside their assigned intersection. However, these instances are rare.

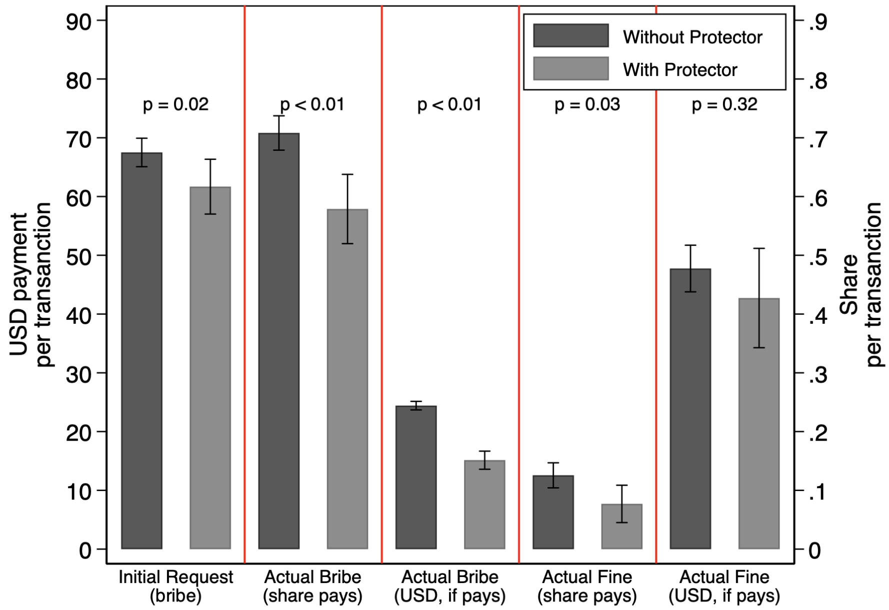
[38]Figure A11 in the Online Appendix, Panel A shows that 23% of drivers have a protector. Panel B shows that most of those are high-ranked police and army officers. Panel C shows the rank of the protector in their professional hierarchy. In the DRC, in the period leading up to the study, the police had a military hierarchy; hence we show the equivalent military ranks as well as the police titles, where were newly introduced at the time of the study.

[39]Table A2 in the Online Appendix presents this analysis in a Differences-in-Differences framework. We find that having a protector is associated with a larger reduction from the bribe request to the actual bribe paid.

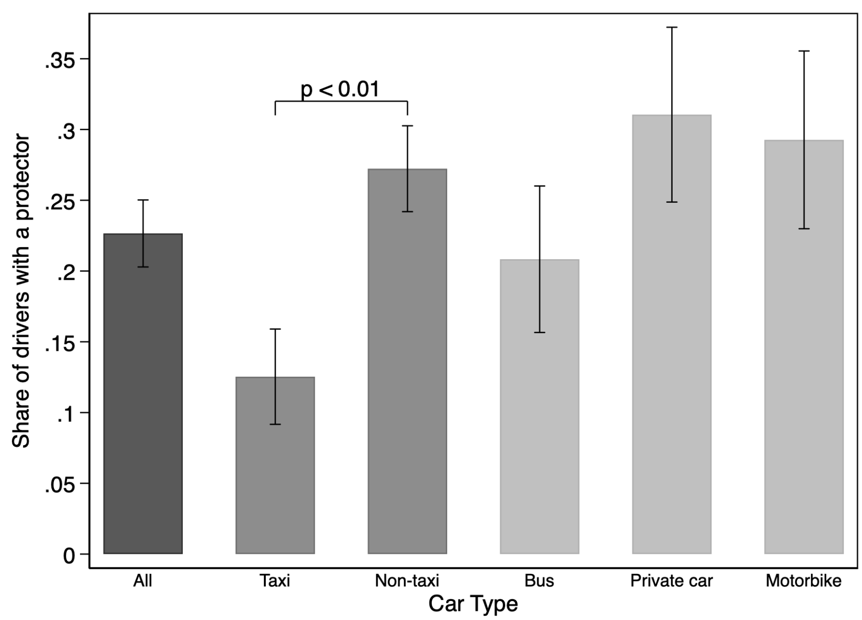
[40]Figure A12 in the Online Appendix shows the fraction of drivers who pay a bribe: 82% of escorted taxi drivers end up paying a bribe, against 62% of non-taxi (the difference is statistically significant at the 1% level).

Figure 3: How Unofficial Revenue is Generated In Police Stations: Negotiation and Protectors

Panel A. Drivers with a Protector Pay Less in Expectation



Panel B. Taxi Drivers are the Least Protected



Notes: This figure documents the steps in the bribe negotiation process between the JPOs and the drivers in the police station. Panel A shows the mean initial request made by the JPOs inside the police stations ("Initial Request (bribe)"), the fraction of drivers who pay a bribe ("Actual Bribe (share pays)"), the mean bribe payment for drivers who pay a bribe ("Actual Bribe (USD, if pays)"), the fraction of drivers who pay a fine ("Actual Fine (share pays)"), and the mean fine for drivers who pay a fine ("Actual Fine (USD, if pays)"). Dark bars represent the means for unprotected drivers. Light bars represent the means for protected drivers. p is the p-value for a test of equality between means in dark vs light bars. Panel B shows the share of drivers with a protector for all car types ("All"), broken by taxi ("Taxi") and non-taxi ("Non-Taxi"), respectively. Non-taxi is decomposed into bus ("Bus"), private car ("Private car") and motorbike ("Motorbike"). The change in color from dark to light indicates the three categories of drivers from higher (darker) to lower (lighter) level: all drivers, taxi vs. non-taxi, types of non-taxi, respectively . p is the p-value for a test of equality of the mean value between taxi vs non-taxi. Error bars indicate 95% confidence intervals. **Source**: police station observers (JPO and FCA).

The data on infractions suggest that the JPOs have the power to forge infractions, and to use this power to threaten to charge official citations based on forged evidence in order to extract a bribe, i.e. extortion. Of the 2,252 alleged violations of the traffic code for which we have data, 56% are unverifiable, such as conducting a dangerous maneuver.[41] While verifiable alleged observations are bound to be likely true because drivers can challenge their testimony with evidence in such cases, allegations of unverifiable infractions, the majority, are sometimes false accusations. The fine collection agents described these as "*fantasy infractions*."[42]

Police stations generate most of their unofficial revenue from the quota scheme. Table 1, Panel A, shows that every day, on average, while a police station requested 18.59 drivers through the quota, it received 17.55 drivers escorted by the agents to the station. Of those, 1.84 are given an FCA citation to pay at the bank, 11.06 pay a bribe to the JPOs within the day, and 5.65 cases remain unresolved at the end of the day. As a fraction of drivers whose cases are resolved within the day, 83% simply pay the JPO a bribe.

Panel B shows that the average fine and bribe in the police station are 45.68 USD and 20.35 USD, respectively. This yields 2,995.30 and 7,667.19 USD on average in fine and bribe revenue monthly, respectively. Mean ratio of police station bribes in police station revenue is 70%.[43] Panel C shows that monthly bribes in the street amount to 4,450.88 USD.

This implies that bribes paid in the stations are 63% of unofficial revenue—the remaining are bribes paid in the street—and that unofficial revenue is 78% of the revenue under the jurisdiction of a station—the remaining is official fine revenue. It implies 241,813.92 USD of monthly revenue for the battalion, of which 47,924.80 USD is official and 193,889.12 USD is unofficial. Annually, this is 2.33 Million USD unofficial and 575,097.60 USD official revenue for the battalion alone.[44]

Panel E shows the unofficial income of the two JPOs and the commander.[45] 91% of the income of the police station staff is unofficial. 76% of commanders make unofficial payments to a high-level official. The average such payment is 123.72 USD monthly. This implies that the monthly unofficial income of station police staff, net of the transfers to their corresponding supervisors,

[41]See Table A3 in the Online Appendix for a breakdown of unverifiable and verifiable infractions.

[42]See Figure A13 in the Online Appendix.

[43]The ratio of mean police station bribes in mean police station revenue (7,667.19/(2,995.30+7,667.19)) is 72%.

[44]The sum of the bribes in the street (4,450.88 USD), bribes in the police station (7,667.19 USD), and fines (2,995.30 USD), is the official and unofficial revenue of one police station's staff and amounts to 15,113.37 USD. To estimate the implied revenue for the battalion, we use the fact that there are 16 police stations in the battalion and 8 in our sample. The latter estimate is based on the assumption that the unobserved remaining 8 police stations generate the same revenue on average. A more conservative assumption that they generate no revenue at all generates the following lower bounds for the battalion's annual revenue: 1.17 Million USD unofficial and 287,548.80 USD official revenue.

[45]Commanders get 143.53 USD in retrocession from agents monthly, ie. 4% of his unofficial income (Panel D).

Table 1: The System Inside Police Stations (Average Per Police Station)

Variables	Mean
Panel A: How Stations Generate Official and Unofficial Revenue (Daily)	
Number of drivers requested by the commander in the police station in one day	18.59
Number of drivers escorted to the police station in one day	17.55
Number of drivers that pay a fine in the police station in one day	1.84
Number of drivers that pay a bribe in the police station in one day	11.06
Number of drivers with unresolved files in one day	5.65
Share of escorted drivers who pay a fine in one day	0.12
Share of escorted drivers who pay a bribe in one day	0.61
Share of driver payments in one day that are a bribe	0.83
Panel B: Official and Unofficial Revenue Yield of a Police Station Arising from Payments inside the Station	
Average value of fine (USD)	45.68
Average value of bribe generated inside police station (USD)	20.35
Monthly station revenue from fines (USD)	2,995.30
Monthly station revenue from bribes (USD)	7,667.19
Share of monthly (official+unofficial) revenue that is unofficial	0.70
Panel C. Unofficial Revenue from Payments in Police Station vs. Payments in the Street (Monthly)	
Bribe revenue from agents at the intersections (USD)	4,450.88
Share of total bribe revenue arising from police station bribes	0.63
Share of (street + police station) bribe revenue in total (unoff. + off.) revenue	0.78
Panel D. Unofficial Monetary Transfers from Agents to the Commanders (Monthly)	
Average unofficial monetary transfers from agents to commanders (USD)	143.53
Share of unofficial monetary transfers from agents to commanders in commander revenue	0.04
Panel E. Official vs. Unofficial Private Income of Police Staff at the Police Station (Monthly)	
Sum of official wages of the manager + two JPOs (USD)	300.00
Sum of gross unofficial income of the manager + two JPOs (USD)	7,810.72
Share of total income of the manager + two JPOs that is unofficial	0.91
Share of commanders who pay an unofficial fee to higher-level police officials	0.76
Average unofficial fee paid by commanders to higher-level police officials (USD)	123.72
Sum of net unofficial income of the manager + two JPOs (USD)	7,716.34
Share of net total income of the manager + two JPOs that is unofficial	0.90

Notes:
1. Panel A shows that 32% of drivers' files are unresolved at the end of the day. For some of those, we have the details of the bribe paid. Where indicated, in subsequent panels of this table (except Panel A and the first two lines in Panel B), we impute the bribe and fine for those that are missing, following the description provided in Supplemental Study Documentation, Section 1. After the first two lines of Panel B, we report the imputed mean.
2. A small set of teams were not observed by our street observers due to feasibility. However, these teams are seen escorting drivers to the police station in our police station data. To present estimates representative of a station, we impute the street level revenues for the teams that we are unable to observe following the description provided in Supplemental Study Documentation, Section 1. This applies to the first line in Panel A, Panel C and Panel D.
3. In Panels D and E, we aggregate the monthly "*unofficial monetary transfers from agents to commanders*" and the monthly "*unofficial fee paid by commanders to higher-level police officials*" at the police-station level and report the weighted mean where the weight is the total number of days in the study for each police station.
4. In this table, we have excluded the observations that were assigned to the quota reduction *encouragement* and that took part of the experiment described in Section 6, since those would not be representative of the system without experimenter interference. We describe this procedure in Supplemental Study Documentation, Section 1.
5. **Sources:** police station observers JPO and FCA (Panel A and Panel B); street observers' records (Panel C and Panel D); authors' calculations integrating the panels above and Titeca and Malukisa (2014) (Panel E).

is 2,572.11 USD per capita (totaling 7,716.34 USD for the manager and the two JPOs).[46] This amounts to 90% of their total income, 37 times their wage, 13 times the wage of a teacher.[47]

5. Conceptual Framework

In this section, we present a simple model that captures the essence of the quota. The model draws on established results in the theoretical literature on collusion. In the canonical model (Tirole, 1986), a principal (such as the government) owns the output produced by a citizen (such as a driver) and wants to incentivize the citizen to provide privately costly effort to produce high output (such as complying with the traffic code). The principal only observes whether the output is high or low. The output is only high if the state of nature is good and the citizen provides effort. Output can be low if the state is bad, but also if the citizen does not provide effort. The principal observes neither the state nor the effort. A supervisor (such as a police agency) has hard information about whether the citizen provides effort. But the supervisor can choose to conceal that information from the principal in exchange for a bribe from the citizen (collusion). In this model, the information held by the supervisor is *hard* information in the sense that the supervisor cannot forge evidence that the citizen has provided no effort when, in fact, she has.

In reality, however, in addition to the power to conceal hard information on citizen shirking, the supervisor also has the power to forge evidence that the citizen has shirked when she has not, i.e. *extortion* (Khalil, Lawarrée, and Yun, 2010, Angelucci and Russo, 2016). Whether the supervisor has the power to extort is important for analyzing the effect of the agency's organization on welfare. Indeed, with no extortion, bribery through collusion may still incentivize the citizen to provide effort, if the bribe she pays to the supervisor is high. But with extortion, bribery may destroy the citizen's incentives to provide effort (such as complying with the traffic code).

Here, we take this problem as given, and model the internal organization of the supervisory agency, in which the agency is also responsible for a second task. There is one period. There is an

[46]Figure A14 in the Online Appendix presents the allocation of official and unofficial income for agents and police station staff. These numbers are close to the self-reported answers in an exit survey conducted at the end of the study. In such survey, on average, agents reported making 17.62 USD in unofficial income daily, amounting to USD 460 monthly, 87% of their total income. The official wage of an agent was 69 USD monthly at the time of the study. With the average month being 30.5 days, there are 4.35 weeks per month. Since agents do not work Sundays, 17.62 daily implies 460 USD monthly. This is more than six times their monthly official wage, and 12 times the city minimum wage. Table A1 in the Online Appendix presents the descriptive statistics from the exit survey.

[47]The Mbudi agreement of 2004 specified a monthly wage of teachers of 205 USD per month, but Brandt (2013) finds that it is closer to 80 USD per month in 2013. With this more realistic estimate, a police station staff member thus makes 32 times the actual wage of a teacher.

exogenous set of drivers. The drivers make no choices, and are characterized by two dimensions: whether they have committed a true infraction, $v_i \in \{0,1\}$, and whether they yield a bribe for the agency if they are charged with making an infraction, $b_i \in \{0,1\}$ (henceforth, *high-bribe drivers*). Let $\sigma_{bv} = E(b_i|v_i = 1)$, $\sigma_{vb} = E(v_i|b_i = 1)$, and $\sigma_{b\neg v} = E(b_i|v_i = 0)$ be the fraction of high-bribe drivers conditional on those who committed an infraction, the fraction of drivers who have committed an infraction conditional on being high-bribe, and the fraction of high-bribe drivers in the set of those who have made no infraction. We assume $\sigma_{bv} > 0$, $\sigma_{vb} > 0$, $\sigma_{b\neg v} > 0$.

There is a police agent (henceforth, the agent). She chooses how much effort to provide in managing traffic, $e_T \in \mathbb{R}^+$. She provides effort to detain drivers, $e \in \mathbb{R}^+$. Share s of that effort e is allocated towards drivers with $b_i = 1$, and the remaining $1 - s$ towards drivers with $v_i = 1$.[48] The agent's payoff is $\beta^A e_T - c(e_T, e)$, where $c(e_T, e) = (e_T + e)^2$, and $\beta^A > 0$.

The agent has a manager. The manager can charge drivers who have committed an infraction, and has the *partial* power to charge drivers who did not commit one, i.e., to extort them. Specifically, the manager can charge share $\alpha \geq 0$ of drivers who have not committed an infraction. We assume that charging is costless, and hence the manager always charges when he can. The manager's payoff is $ay(e)b + \beta^S e_T$, where $b > 0$ is the bribe paid by drivers who pay a bribe, $y(e)$ is the number of escorted drivers as a function of e, where $y'(e) > 0$ and $y''(e) < 0$, and $\beta^S > 0$ is an exogenous parameter. $a > 0$ is the fraction of escorted drivers who yield a bribe, thus $a = s(\sigma_{vb} + (1 - \sigma_{vb})\alpha) + (1 - s)\sigma_{bv}$.[49] In the first step of the period, the manager chooses e and s anticipating that, in the second step of the period, the agent takes e and s as given and chooses e_T, which the manager cannot observe.[50] The manager's problem is:

$$\max_{e,s} \quad ay(e)b + \beta^S e_T$$
$$s.t. \max_{e_T} \quad \beta^A e_T - c(e_T,e)$$

The unique solution for e is $e^* = h\left(\frac{\beta^S}{b(s(\sigma_{vb}+(1-\sigma_{vb})\alpha)+(1-s)(\sigma_{bv}))}\right)$, where $h(x)$ is a decreasing function of x. The manager's bribe-taking opportunity b increases the agent's effort to detain.

The quota, e, can affect each of the agency's two mandates: traffic management, and enforcement. First, the effort to detain, e, induced by the manager's incentive b could reduce the agent's

[48]We assume she cannot do both, and for each unit of effort, she focuses entirely on one or the other dimension.

[49]This fraction is determined as follows: σ_{vb} is the fraction of drivers who have committed an infraction, amongst high-bribe drivers. These yield a bribe. The remaining fraction $1 - \sigma_{vb}$ of drivers who yield a bribe when charged with an infraction did not commit a true infraction, but the manager charges share α of those regardless. Thus, in addition to share σ_{vb}, share $(1 - \sigma_{vb})\, \alpha$ of drivers who have committed an infraction also yield a bribe.

[50]For instance, due to the fact that output (traffic jams and accidents) is a noisy function of effort to manage traffic.

effort to manage traffic, e_T, if it induces substitution of effort away from traffic management, e_T, and if traffic management e_T is effective to improve traffic. Formally, the manager's opportunities to take bribes have the following effect on the agents' effort to manage traffic.

Proposition 1 *A higher effort to detain e, dis-incentivizes the agent to manage traffic e_T, i.e. $\frac{de_T^*}{de} < 0$.*

The intuition is that the manager's opportunities for bribe-taking induce agent effort substitution away from traffic management and towards detaining so that the manager extracts bribes.[51]

Second, the manager's opportunities for bribe-taking, which sustain a high level of e, could increase the wedge in the expected payment by drivers who have committed an infraction and those who have not (henceforth, the *wedge*)—the rationale for the second task.[52] The manager chooses $s = 1$, focusing on $b_i = 1$ drivers if, and only if $\sigma_{vb} + (1 - \sigma_{vb})\alpha - \sigma_{bv} > 0$ and focuses on drivers who have committed a true infraction otherwise. If α is sufficiently large (i.e., if $\alpha \geq \alpha^*$, where $\alpha^* > 0$), the manager chooses $s = 1$, focusing all detainment on high-bribe drivers rather than on drivers who have committed an infraction. The targeting of drivers has implications for how effort to detain induced by the manager affects the agency's second mandate, enforcement:

Proposition 2 *a. if the manager's power to extort is large relative to the distribution of drivers, specifically if the fraction high bribe drivers who pay a bribe either because they commit an infraction or because they are extorted is larger than that of drivers who committed an infraction, who pay a bribe anyways, i.e. $\left(\alpha > \frac{\sigma_{bv} - \sigma_{vb}}{1 - \sigma_{vb}}\right)$, then $s = 1$; b. if $s = 1$, more detaining, e, reduces the wedge if, and only if $\alpha\sigma_{b\neg v} > \sigma_{bv}$.*

The intuition for Proposition 2 is that, by targeting high-bribe drivers rather than drivers who have committed an infraction, the effect of effort to detain on the wedge may vanish if false charges predominate. This provides two testable implications.

a. with *high* power to extort, the quota should induce agents to target high yield drivers ($s = 1$), rather than those who have committed an infraction.

b. if $s = 1$, the quota destroys the effect of e on the drivers' incentives to comply if the number of false charges it induces under $s = 1$ exceeds the number of true charges.

[51] This result is conditional on the functional form $c(e_T, e)$, and is true if, and only if, $\frac{\partial^2 c(e_T, e)}{\partial e_T \partial e} > 0$, that is, the two efforts are complements in the agent's effort cost function. This assumption is reasonable in situations in which the agent has scarce time and attention to allocate to multiple tasks. For simplicity, we have assumed $c(e_T, e) = (e_T + e)^2$, where $\frac{\partial^2 c(e_T, e)}{\partial e_T \partial e} > 0$ holds by assumption.

[52] This wedge increases social welfare, accruing outside of this framework, arising from the drivers' incentives to comply with the code created by the wedge. A similar informal argument is made in Olken and Barron (2009).

To analyze these implications, we experimentally reduce the quota and measure its effect on: 1. traffic management; the composition of: 2a. high-bribe drivers; 2b. false alleged infractions.

6. Experiment Design: Manager Encouragement to Reduce the Quota

In a sub-set of the observational sample (henceforth, experimental sample), we provided a randomized *encouragement* to the police station managers to reduce, *in selected days*, the quotas of some intersections over which they have jurisdiction.[53] Section 1 of the Supplemental Ethics Appendix provides background, and Sections 2, 3, 4 discuss the ethics of experimentation.

A. *Experimental Sample*

The planned experimental sample is a panel dataset consisting in 450 units potentially assigned to *encouragement* assignment—the team of agents-day observations. It excluded the first day of the observational sample (June 19$^{\text{th}}$ 2015) and was constituted of 18 teams of agents, each attached to one corresponding intersection, covering all days from June 20$^{\text{th}}$ 2015 to July 20$^{\text{th}}$ 2015 (excluding Sundays). Due to feasibility constraints, we also dropped a small set of intersections a few days after the experiment's launch, it is hence an imbalanced panel of in 337 teams of agents-days.

B. *The Encouragement Design, and Associated Treatment*

The design leverages that each manager commands multiple teams of agents, and deploys each of his teams permanently to a specific intersection. While agents have some freedom to move between intersections during the day, re-deployment of agents across intersections is rare.[54] The normal channel through which managers communicate the quota to the corresponding teams is a routine phone call placed by the commander to the team leader each morning. The mean quota level without the quota reduction *encouragement* is 6.5 While teams' quotas vary day by day, the typical quota level of each team is well-known (henceforth, *natural quota*).

The *encouragement* provided consists in encouraging the managers not to request more than half a team's natural quota, for a given day and a given team. To implement the *encouragement*, prior to the experiment, we identified the natural quotas for each team. Then, we encouraged

[53] All results in Section 4 are estimated in the sample without quota reduction *encouragement*.

[54] Indeed, of all of the police agents within the battalion in our study, during the period of the study, only one agent was re-deployed to another intersection, and two were fired for indiscipline. We tracked the police agents' deployment on a daily basis through the study. To gather this information, the assistants interacted daily with the agents and, while they obtained information on the quota, they also updated for any change in deployment.

the managers to request *at most* half of the team-specific estimated natural quota for teams under their control, on specific days for each team.[55] The researchers only communicated the specific assignment to each manager for the corresponding day in the early morning, prior to the hour at which the managers routinely placed the morning call to his team. Thus, the *encouragement* was designed to follow the quota's normal communication channel. Given this encouragement design, the *treatment* itself consists in the commanders reducing the quota they communicate to a given team for the day, through the normal channel of the routine morning call.

For the *encouragement* to translate into actual quota reduction, the managers needed to be given compensation for the reduction, and incentives to participate. First, we compensated managers for the loss that compliance to our quota reduction *encouragement* would cause. To implement this compensation, we gathered estimates for the revenue generated by each driver at the police station prior to the study, that is, *before* informing managers that we had the intention to reduce the quota in some days. This timing ensured that managers had no incentives to over-report the revenue per driver. The research team compensated the managers the same moment in which we communicated that a specific team deployed at a given intersection had been selected that day.[56] Second, to provide incentives for managers to comply, our agreement specified that, if the managers did not comply, they would lose future participation in research.[57]

Assignment was randomized. Specifically, assignment of the quota reduction *encouragement* to days was random within each of the 18 teams, between June 20$^{\text{th}}$ and July 20$^{\text{th}}$ 2015 (excluding Sundays). That is, the assignment to the quota reduction treatment was random, with teams as randomization strata and team $\times$ day as randomization clusters. Since we randomized within team strata, this allowed the number of treated and control days to be the same for each team.[58]

C. *Randomization Check and Treatment Compliance*

In this section, we verify compliance to the treatment *encouragement* assignment in two steps.

First, we analyze compliance to providing the quota reduction *encouragement* by the researchers. The quota reduction *encouragement* design provides the researchers with opportunities

[55] On each selected day, a randomization calendar specified the quota level *not* to surpass.

[56] To ensure compliance within our research team, we created a multi-layered finance monitoring structure tracing the payments made from the project's bank account to a project coordinator, and from the coordinator to the team making the payment, and we hired an auditor to inspect how much each managers received at the end of the day. To reduce the risk that the auditor colluded with the research team staff in charge of delivering the payment to the managers, the auditor was hired through networks from the East of the country, from where he flew for the project.

[57] Commanders were also motivated by the desire to nurture a relationship with the research team.

[58] Figure A15 in the Online Appendix presents the allocation of the quota reduction treatment over time.

for corruption: they could forgo encouraging commanders to reduce the quota, and keep the quota reduction compensation. We designed a system, hiring an independent auditor, to verify whether the researchers paid the quota reduction compensation and communicated the *encouragement* as specified in the randomization calendar.[59] Table A4 in the Online Appendix, Panel A, tests whether the research team complied with the randomized assignments.[60] Assignment to *encouragement* made it 96.7% more likely that the research team administered the *encouragement*.

Second, even if the research team administered the quota reduction *encouragement*, the managers themselves may still have had incentives to pocket the compensation while keeping the quota level high. We also analyzed compliance by the managers themselves, using the measurement of the quota that we described in Section 3. In Table A4 in the Online Appendix, Panel B, we analyze compliance by examining the effect of assignment to the quota reduction *encouragement* on the quota level.[61] We find that units assigned to quota reduction *encouragement*, have a 67% higher target quota reduction rate than those not assigned to the *encouragement*, akin to a 67% compliance rate.[62] Thus, the *encouragement* assignment induces random variation in the quota.

D. *Randomization Balance*

Since the *encouragement* was assigned within team of agents strata, the constant characteristics of police agent teams are balanced by construction. We find no significant difference in treatment assignment status across day of the week, month, day, and assignment lag.[63]

In the next section, we examine whether the quota worsens traffic management.

[59]The algorithm used to assemble the various sources on whether the researchers truly administered the encouragement is presented in Supplemental Study Documentation, Section 6.

[60]In Table A4 in the Online Appendix, Panel A, the independent variable is an indicator for whether the team-day was assigned to the *encouragement*. The dependent variable is an indicator for whether the research team administered it correctly, which includes that they communicated it to the manager and paid the corresponding compensation.

[61]The independent variable is an indicator for assignment to assignment to quota reduction *encouragement*. The dependent variables are the measure of the quota level (Columns (1)-(3)) and a ratio measuring the rate of quota reduction target fulfilment, the target quota reduction rate (Columns (4)-(6)). The target quota reduction rate is the natural quota for the corresponding intersection minus the actual quota that day for that intersection, in units of the natural quota for that intersection, multiplied by 2. We multiply the ratio by 2, since the target quota reduction in the treatment *encouragement* group is 50% of the mean quota. That means target quota reduction is $2 \times \frac{\text{natural quota level - observed true quota level}}{\text{natural quota level}}$. A rate of 1 indicates that the quota has been reduced to half its natural level.

[62]Since the researchers had a 96.7% compliance rate, this implies managers had a .67/.967=69.3% compliance rate.

[63]Table A5 in the Online Appendix reports the result of a balance test.

7. Effect of the Quota on The First Mandate: Traffic Management

In this section, we exploit the experimentally induced variation in the level of the quota to estimate the effect of the quota on traffic outcomes. Since that effect could arise through its effect on the agent's allocation of effort, we also analyze the agent effort allocation.

Let i index the intersection and t index the day. In some specifications, since the team of agents is attached to a specific intersection, i also indexes the team of agents. To analyze the effect of the quota reduction *encouragement* on traffic outcomes, we estimate the following equation:

$$y_{it} \quad = \quad \alpha + \beta\, T_{it}^{quota} + \eta_i + \eta_t + e_{it} \tag{1}$$

where y_{it} measures traffic outcomes, $T_{it}^{quota} \in \{0,1\}$ is an indicator taking value one if the team of agents was assigned to the quota reduction *encouragement*, η_t is day t fixed effect, and η_i is an intersection i indicator, the randomization block. In this specification, β is the reduced form coefficient, measuring the effect of the quota reduction *encouragement* on the dependent variable y_{it}.[64] Across the manuscript, we present the reduced form coefficient in figure format by presenting the mean of intersection-days not assigned to the *encouragement*, the mean of those assigned to the *encouragement*, the 95% confidence interval of the coefficient, adjusted to the *encouragement* group mean to represent whether it overlaps with the control mean, as well as the p-value for the test for whether the means of both groups are the same.[65]

We also quantify the local average effect of a one-unit increase in the quota on the dependent variable y_{it} using the variation in the quota level induced by random assignment to the *encouragement*. To do so, we estimate the following system of equations in two-stage least squares:

$$y_{it} \quad = \quad \alpha^{2SLS} + \beta_Q^{2SLS}\, \hat{Q}_{it} + \eta_i^{2SLS} + \eta_t^{2SLS} + e_{it}^{2SLS} \tag{2}$$

$$Q_{it} \quad = \quad \alpha^{FS} + \beta_T^{FS}\, T_{it}^{quota} + e_{it}^{FS} \tag{3}$$

where $Q_{it} \in \mathbb{N}$ is the true (observed) level of the quota. In this system of equations, the variable $T_{it}^{quota} \in \{0,1\}$ is the instrumental variable for Q_{it}. Parameter β_Q^{2SLS} measures the effect of a one-driver increase in the quota level on the dependent variable. As usual, this effect is estimated from the sub-population that complied with the *encouragement* to reduce the quota.

[64] Assignment probabilities are identical across units, hence, since T_{it}^{quota} is randomly assigned within the strata, unweighted OLS produces an unbiased estimator.

[65] We have shown in Section 6 that the quota reduction *encouragement* was associated with 67% compliance, hence the reduced form coefficient *under*estimates the effect of reducing the quota. The reduced form coefficient measures the effect of encouraging the commander to reduce the quota in half.

A. *Main Result: Effect of the Quota on Traffic Outcomes*

The quota scheme worsens traffic outcomes. Figure 4 presents the daily occurrence of accidents (Panel A), and of traffic jams (Panel B), separately for intersection-days for which the corresponding team of agents-day was not assigned to quota reduction *encouragement* (left), and those for which it was (right). Panel A shows that the mean number of hours in which there is an accident in an intersection-day assigned to no quota reduction *encouragement* is .81, and that this number decreases to .26 in intersection-days assigned to the quota reduction *encouragement*, a 67.9% reduction. The p-value of the difference is less than .01. Panel B shows that, on average, the number of hours in which there is a traffic jam is 1.47 for intersection-days not assigned to the quota reduction and that in those assigned to the quota reduction, it is 1.12, a 23.8% decrease.

In Table 2, we estimate Equation 2 to analyze the local average treatment effect of a one-unit increase in the quota level on the traffic outcomes. We report the 2SLS coefficient, as well as the effective F-statistic of the first stage (Olea and Pflueger, 2013). Columns (1) and (2) analyze its effect on the occurrence of accidents. Columns (1) and (2) indicate that a one-driver increase in the quota requested by the manager increases the number of hours with an accident in the corresponding intersection by .23, and the probability of having at least one accident by 5pp, respectively. Columns (3) and (4) analyze its effect on the occurrence of traffic jams. Columns (3) and (4) show that a one-driver increase in the quota increases the number of hours with a traffic jam by .15, and increases the probability of observing a traffic jam by 3.5pp, respectively.

Overall, the quota scheme *causes* a significant worsening of traffic outcomes, causing accidents and traffic congestion. We now present a back-of-the-envelope calculation to quantify the effects on traffic outcomes induced by the quota scheme.

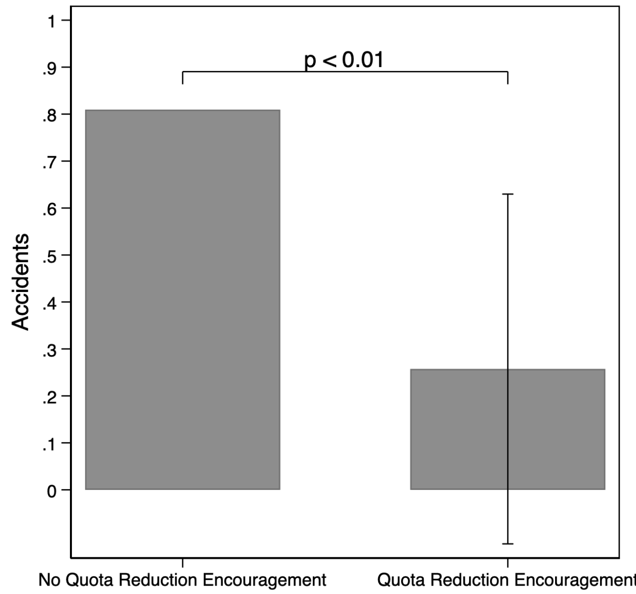
B. *Quantifying the Social Cost Created by the Quota Scheme Through Traffic Outcomes*

We now place these estimates in context to interpret their magnitude.

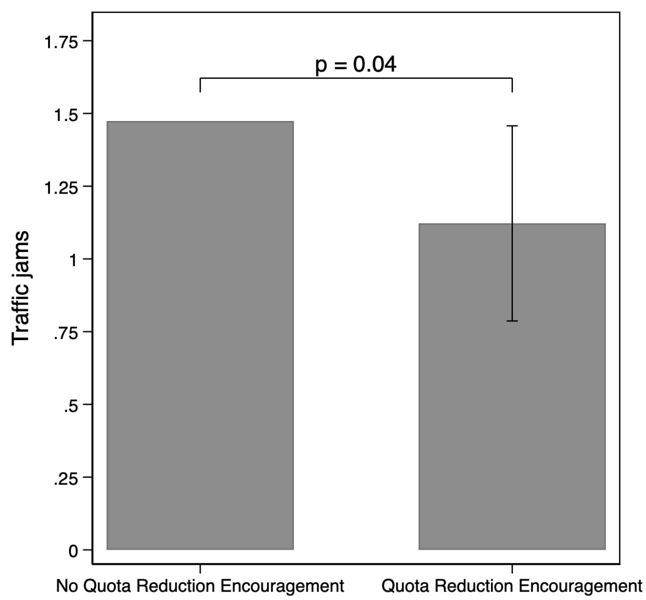
First, the magnitude of these estimates is significant. The mean number of hours with an accident, and with a traffic jam, are .84 and 1.46 at intersection-days for which the corresponding team was not assigned to quota reduction *encouragement*, respectively. The estimated coefficient implies that for every 4.4 drivers requested for a day through the quota by the manager from an intersection, there is one more hour in that day in which an accident occurs at the corresponding intersection. For every 6.8 drivers requested, there is one more hour with a traffic jam.

Figure 4: Effect of the Quota Reduction Encouragement on Traffic Outcomes

Panel A. Occurrence of Accidents



Panel B. Occurrence of Traffic Jams



Notes: This figure presents the mean of the daily occurrences of accidents per intersection (Panel A) and the mean of the daily occurrences of traffic jams per intersection (Panel B), separately for the sample not assigned to the quota reduction *encouragement* and for the sample assigned to the quota reduction *encouragement*. Accidents and traffic jams were measured and constructed as follows. The observers completed a questionnaire every hour, answering the following questions concerning the intersection over the previous hour: a. whether there were traffic jams or not; b. whether there was an accident or not. Using the street observers' reports of whether an accident, and whether a traffic jam occurred in a given intersection-hour, we construct indicators taking value 1 if at least one of the observers posted to a given intersection (there are two observers at each intersection through the working hours of the day) reported there to be one in the corresponding intersection-hour. We then sum these intersection-hour indicators at the *intersection - day level*, constituting the number of hours in the day in which an event was recorded at a particular intersection. The figure shows the re-scaled confidence interval *on the reduced form coefficient*, as well as the *p*-value for the difference between the two groups. Error bars indicate 95% confidence intervals. p is the *p*-value of the reduced form estimates in Equation 1, including randomization block (intersection) fixed effects and day fixed effects. The experimental sample covers 337 teams of agents/intersections-day observations, which are also the units of assignment, 327 of which have non-missing quota level. Observations for which the dependent variable are missing are dropped. There is no selection of data missing on treatment assignment. **Source:** street observers' records of events.

Table 2: Effect of the Quota on Traffic Outcomes

	Dep. var:			
	Accidents		Traffic jams	
	#	0/1	#	0/1
	(1)	(2)	(3)	(4)
Quota level	0.225***	0.0516***	0.146**	0.0354*
	(0.0785)	(0.0161)	(0.0666)	(0.0188)
First-stage *F*-statistic	84.68	84.68	84.68	84.68
Randomization block FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
Dep. var. mean (no encouragement)	0.84	0.19	1.46	0.51
Dep. var. mean (encouragement)	0.30	0.07	1.37	0.46
Observations	323	323	323	323

Notes: This table presents the estimates of $\hat{\beta}_Q^{2SLS}$ in Equation 2 to analyze the local average treatment effect of a one-unit increase in the quota on the traffic outcomes. Accidents and traffic jams were measured and constructed as follows. The observers completed a questionnaire every hour, answering the following questions concerning the intersection over the previous hour: a. whether there were traffic jams or not; b. whether there was an accident or not. Using the street observers' reports of whether an accident, and whether a traffic jam occurred in a given intersection-hour, we construct indicators taking value 1 if at least one of the observers posted to a given intersection (there are two observers at each intersection through the working hours of the day) reported there to be one in the corresponding intersection-hour. In odd columns, the dependent variable is the number of hours in which an event was recorded at the *intersection - day level*. In even columns (denoted 0/1), it is an indicator taking value one if at least one such event was recorded at the *intersection - day level*. We report the 2SLS coefficient, as well as the effective F-statistic of the first stage following Olea and Pflueger (2013). We include randomization block fixed effects (Randomization block FE) and day fixed effects (Day FE) in all columns. Dep. var. mean (no encouragement) and Dep. var. mean (encouragement) report the mean of the dependent variable for the regression sample without and with the quota reduction *encouragement*. The experimental sample covers 337 teams of agents/intersections-day observations, which are also the units of assignment, 327 of which have non-missing quota level. Observations for which the dependent variable are missing are dropped. There is no selection of data missing on treatment assignment. **Source:** street observers' records of events.

Second, the magnitude of these estimates implies that the quota scheme is responsible for a very large share of traffic harms observed at the battalion's intersections. The mean quota is 6.5.

Consider the occurrence of accidents. The mean level of accidents in an intersection not assigned to the quota reduction *encouragement* is .84. Given that a one-driver reduction in the quota level reduces the number of observed accidents by .225, the linear model implies that elimination of the quota scheme for a given intersection, while allowing bribe-taking by the agents to remain unconstrained, would reduce the occurrence of accidents at the corresponding intersection essentially to zero. These estimates imply that shutting down manager corruption by eliminating the quota scheme while retaining the agents' own bribe-taking would reduce the daily number of accidents that take place in the 18 experimental intersections from 15.12 to zero.

Consider the occurrence of traffic jams. The mean number of hour blocks with a traffic jam is 1.46 when the quota level is not experimentally reduced. Given that a one driver reduction in the quota level reduces the number of hour blocks with traffic jams by .146, shutting down the quota in an intersection would reduce the number of hours per day in which there is traffic jam from 1.46 to 0.51. That is, close to 65% of hours in which there is a traffic jam at the experiment intersections could be avoided shutting down the quota scheme. This implies that shutting down the quota scheme, while retaining the agents' own bribe-taking, would reduce the daily number of intersection-hours with a traffic jam in the 18 experiment intersections from 26.28 to 9.18.

Finally, these estimates imply the failure of a Coasean bargain between the managers and the collective of drivers, arising from the surplus destroyed from traffic harms. Consider the minimum monetary compensation that a manager would be willing to accept (henceforth, WTA) in order to reduce the harm done with respect to the traffic outcomes. A one-unit increase in the quota level increases the bribe revenue generated by the police station by 8.314 USD (we analyze the effect of the quota level on corruption revenues in Section 9). Since a one-unit increase in the quota increases the number of accidents by .225 at the corresponding intersection, the WTA to reduce accidents by one is $1/.225 \times 8.314 = 36.95$ USD. That is, it takes only 36.95 USD to compensate a manager to reduce accidents by one. Identical calculation shows that for each hour freed of traffic jams, a manager would need to be paid a minimum of 56.95 USD.

Assume that, for each driver caught in a traffic jam, 30 minutes are lost. Assume that the average daily income is 15 USD, amounting to an *hourly* opportunity cost of 1.875 USD hence the opportunity cost to one driver caught in a traffic jam is 0.9375 USD. The number of drivers caught in a traffic jam in the intersection per minute is 32.[66] Assume that, in addition to those, twice as many drivers are also affected driving up to the intersection, ie. 64. This implies that one traffic jam wastes 90 USD ($.9375 \times 32 \times 3$) in drivers' income, in addition to the payments made by the drivers who are escorted and pay bribes, ie. 56.95 USD. This cost, entirely born by drivers, is larger than the manager's benefit of 56.95 USD. Considering the effect of the quota on accidents, it is reasonable to assume that the mean cost of an accident, also born by drivers, is hundreds of dollars, often involving more than one driver. In contrast, it would only take 36.95 USD to compensate a commander to reduce the quota by a level as to avoid one accident. Since the quota causes both accidents and traffic jams jointly, the inefficiency is even larger.

To conclude, our estimates suggest that the effect of the quota is of a significant magnitude. They suggest that most accidents, and a 65% of traffic jams are caused by the quota scheme. They also suggest that the social cost induced on drivers arising from the loss of time and the

[66] See Section 4 and Figure A9 in the Online Appendix.

economic costs of accidents is significantly larger than the private gain to the manager. While a more comprehensive analysis would require carefully examining how the gain of the manager is used, our analysis suggests that this is a significant social cost.[67]

C. *Effect of the Quota an Agents' Behavior: Traffic Management and Absenteeism*

To document the possible ways in which the quota scheme influences traffic outcomes, we now turn to examining the effect of the quota on agent behavior. While we are unable to reliably rule out that other mechanisms than agent behavior, or even other dimensions of agent behavior, are also a channel through which the quota reduction *encouragement* influences traffic outcomes (lacking exogenous variation in agent behavior), we can nonetheless assess whether agent behavior plays a role by examining whether it is also affected by the *encouragement*.

Since the quota level is just variation in a number conveyed in a routine phone call in the morning, its effect is unlikely to arise other than through how it influences the actions of the agents. We document the two most plausible ways in which the response by the agents may be accountable for these traffic harms. Specifically, we analyze the effect of the quota on the agents' attempts to escort drivers, which may by themselves have a direct effect on traffic outcomes by creating chaos, and on the time agents spend away from the intersection.

Figure 5, Panel A, shows that the quota reduction *encouragement* leads the agents to attempt to escort drivers less often. Panel A shows the mean number of attempted escorts aggregated using our observers' data at the level of each team of agents/day. We define "attempted escort" as an interaction between a driver and an agent in which the agent escorts the driver to the police station (successful), or in which the agent is seen harassing the driver trying to get hold of the vehicle, but in which they fail to escort the driver (failed). Failed escorts are escorts attempts in which the driver escapes, or in which the driver makes a bribe payment to the agent that is neither a toll fee (mbote ya likasu) nor a voluntary contribution. This type of bribe (resulting from a tracasserie interaction) is called "*amende hors bureau*" ("bribe outside police station") in this setting and is easy to identify. Without the quota reduction *encouragement*, the average team-level number of attempted escorts is 11.22. With the quota reduction *encouragement*, it is 8.67. The p-value of the difference is .01. That is, the quota induces a large reduction in attempted escorts.

[67]We assess the robustness of this result to how we measure traffic jams in two ways in Supplemental Study Documentation, Section 7. In Subsection A, we use the street observers' source to and present different approaches to measure the occurrence of a traffic jam. The results are identical. In Subsection B, we introduce an external source to measure traffic jams and use it to replicate the result. The quota increases traffic jams using that source too.

Panel B shows that the quota reduction *encouragement* causes the agents to spend less time away from their corresponding intersection escorting drivers. Panel B shows the mean number of minutes that each agent is away from their intersection. We measure the time away as the gap between the timestamp at which the agent is seen interacting with a driver for an escort to the police station and the timestamp of the agent's next interaction at the intersection. Without the quota reduction *encouragement*, an agent spends 48.77 minutes per day away from the intersection in escorting related tasks. With the quota reduction *encouragement*, they spend 36.23 minutes, a 25% reduction. The p-value for the difference is .02.

Table 3 presents the estimates of Equation 2. Panel A, Columns (1)-(3) show that a one-driver increase in the level of the quota is associated with a one-driver increase in the number of attempted escorts. A large share of the increase in attempted escorts is successful (column 2), and the remainder are failed escorts (column 3). The coefficients imply that 55% of the additional escort attempts are successful. Column (4) shows that a one-driver increase in the quota increases the number of minutes away from the intersection by 4.2 minutes for each agent. This implies that the quota scheme alone induces each agent to miss 27 minutes each day from the intersection, amounting to 1:48 person-hours of absenteeism in a team of four agents, the majority.

In sum, the quota induces the teams at the corresponding intersections to provide more effort to attempt to escort drivers, and results in the agents spending significantly more time away from the intersections.[68] While we are unable to disentangle whether the effect of the quota on traffic outcomes arises through the direct effect of attempted escorts, or by creating officer absenteeism, the evidence we provided suggests it does so through influencing the behavior of the agent.[69]

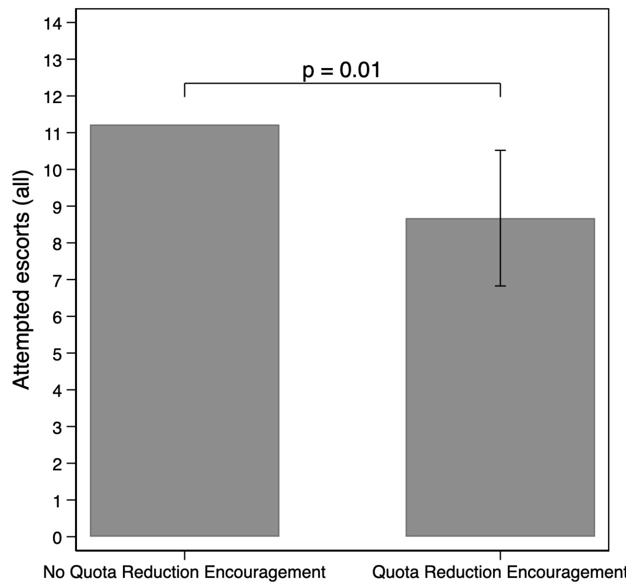
To provide additional suggestive evidence that the quota worsens traffic outcomes *because* it influences the behavior of the agents, we now analyze the heterogeneous effect of the quota reduction on traffic outcomes, by the extent to which agent behavior can be *relevant* to traffic outcomes. Specifically, Panel B of Table 3 replicates the analysis of accidents and traffic jams, but separates it into observations taking place at an hour in which the risk of traffic jams is high vs. low. For the high risk hours, changes in the behavior of the agent can be expected to have stronger effects on traffic. For the low risk hours, changes in the behavior of the agent will be unlikely to cause traffic jams. In Columns (1)-(4), the dependent variable is the number of

[68]A direct effect of the quota could arise if attempted escorts block traffic or create chaos. We find limited evidence for this in the qualitative open-ended questions after each of the 13,254 interactions observed at the intersections.

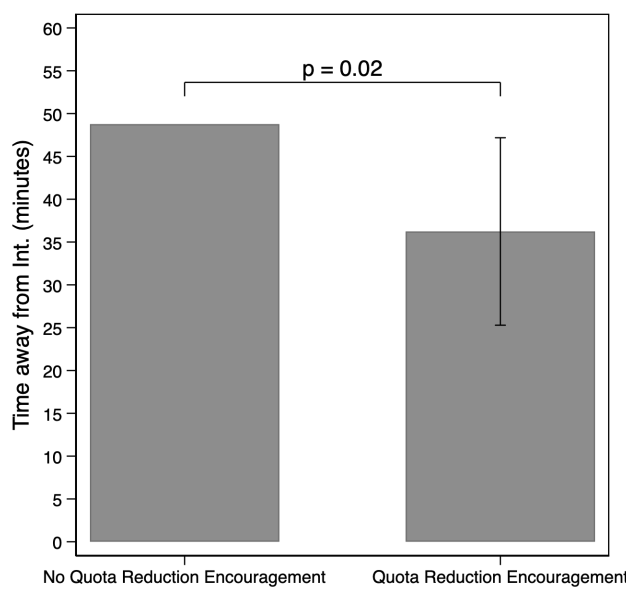
[69]Supplemental Study Documentation, Section 7 part C, we replicate the analysis with different aggregation procedures. The results are unaffected by the aggregation.

Figure 5: Effect of the Quota Reduction Encouragement on the Behavior of the Agents

Panel A. Number of Attempted Escorts



Panel B. Time Away from Intersection to Which They are Deployed



Notes: This figure presents the mean daily number of attempted escorts per team (Panel A) and the mean daily total minutes spent away from intersections due to escorting per agent (Panel B), separately for the sample not assigned to the quota reduction *encouragement* (left bars) and for the sample assigned to the quota reduction *encouragement* (right bars). "Attempted escort" is an interaction between a driver and an agent in which the agent escorts the driver to the police station (successful), or in which the agent is seen harassing the driver trying to get hold of the vehicle, but in which they fail to escort the driver (failed). Failed escorts are the ones in which the driver escapes, or in which the driver makes a bribe payment to the agent that is neither a toll fee nor a voluntary contribution. "Time away from Int." is the gap between the timestamp at which the agent is seen interacting with a driver for an escort to the police station and the timestamp of the agent's next interaction at the intersection. The figure shows the re-scaled confidence interval *on the reduced form coefficient*, as well as the p-value for the difference between the two groups. Error bars indicate 95% confidence intervals. p is the p-value of the reduced form estimates in Equation 1, including randomization block (team of agent/intersection) fixed effects and day fixed effects. The experimental sample covers 337 teams of agents/intersections-days, which are also the units of assignment, 327 of which have non-missing quota level. Observations for which the dependent variable are missing are dropped. There is no selection of data missing on treatment assignment. **Source:** street observers' records of events.

recorded accidents in a day-intersection. In Columns (1) and (2), we restrict the sample used when computing the daily number of accidents by whether the hour is an hour with a high risk of congestion. We code hours as high risk if, in the sample of intersection-hours not assigned to quota reduction *encouragement*, the fraction of observations with a traffic jam at that hour is larger than the median fraction. High risk hour blocks are concentrated in the rush hour.

Columns (1) and (2) show that the effect of the quota on accidents is unrelated to whether the hours over which the number of accidents are high vs. low risk. In Column (3), we restrict the analysis to intersection-days affected by the market days of Friday and Saturday. In those, there is a known large influx of drivers coming from Angola to the markets in Kinshasa, affecting disproportionately a subset of the intersections linking the road to Angola to the markets. The effect of the quota on accidents is unaffected by the risk of a traffic jam.

In contrast to its effect on accidents, the effect of the quota on traffic jams is entirely driven by intersection-hours and intersection-days in which substitution of the agents' effort is most likely to cause traffic congestion. Columns (5)-(8) replicate the analysis using the number of hour blocks with a traffic jam as the dependent variable. Columns (5) and (6) show that the entire effect of the quota on traffic jams is channeled through the hours in the day in which the risk of a traffic jam is high. Columns (7) and (8) use conduct the analysis of heterogeneity by whether the intersection-days are affected by the congestion of traders from Angola. Again, they show that the quota causes a sharp rise in traffic jams only on those days in which congestion is possible. That is, precisely in those days in which poor traffic management effort could translate into congestion. Thus, the effect of the quota on traffic jams is concentrated in hours in which a change in the behavior of the agents could have the largest effect on congestion. This is consistent with the quota influencing traffic outcomes through change in the agents' behavior.[70]

In sum, this section has shown that the quota scheme is responsible for a significant share of the accidents and traffic jams taking place at the intersections covered by the battalion. We have provided suggestive evidence that this effect may arise from the quota incentivizing agents to allocate their effort away from traffic management, resulting in more attempts to escort drivers, and more time away from the intersection escorting drivers to the station.

However, while it is unambiguous that the scheme causes congestion and reduces safety, its effect on society *on net* depends on its effect on the drivers' incentives to comply with the traffic code. We now analyze the implications of Proposition 2 to answer this question.

[70]Figures A16 and A17 in Online Appendix show driver escorts by hour and reduced form estimates, respectively.

Table 3: Effect of the Quota on Agents' Behavior: Main Effect and Heterogeneity Analysis

Panel A. Main Effect

	Dep. var:			
	Attempted escorts #			Time away
	All	Successful	Failed	from Int. (minutes)
	(1)	(2)	(3)	(4)
Quota level	1.067***	0.582**	0.486**	4.201**
	(0.373)	(0.276)	(0.190)	(2.092)
First-stage *F*-statistic	82.07	82.07	82.07	82.08
Randomization block FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
Dep. var. mean (no encouragement)	11.32	7.50	3.83	46.41
Dep. var. mean (encouragement)	8.94	6.26	2.68	35.90
Observations	319	319	319	316

Panel B: Heterogeneity Analysis

	Dep. var:							
	Accidents #				Traffic jam #			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quota level	0.131**	0.094**	0.224*	0.202**	0.142***	0.005	0.263**	0.071
	(0.058)	(0.041)	(0.129)	(0.094)	(0.048)	(0.033)	(0.112)	(0.079)
First-stage *F*-statistic	84.68	84.68	23.07	63.34	84.68	84.68	23.07	63.34
Sample	High risk	Low risk	Market	Non-market	High risk	Low risk	Market	Non-market
Randomization block FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dep. var. mean (no encouragement)	0.49	0.35	0.84	0.83	1.04	0.42	1.32	1.56
Dep. var. mean (encouragement)	0.15	0.16	0.26	0.32	0.86	0.52	1.37	1.38
Observations	323	323	117	206	323	323	117	206

Notes: This table presents the estimates $\hat{\beta}_Q^{2SLS}$ from Equation 2. Panel A analyzes the effect of the quota on the attempted escorts and time spent away from intersections. The dependent variables across column (1) and column (4) are the daily number of attempted escorts per intersection, the daily number of *successful* attempted escorts per intersection, the daily number of *failed* attempted escorts per intersection and the daily total minutes away from the intersections per agent due to escorting, respectively. "Attempted escort" is an interaction between a driver and an agent in which the agent escorts the driver to the police station (successful), or in which the agent is seen harassing the driver, trying to get hold of the vehicle, but in which they fail to escort the driver (failed). Failed escorts are escort attempts in which the driver escapes, or in which the driver makes a bribe payment to the agent that is neither a toll fee nor a voluntary contribution. "Time away from Int." is the gap between the timestamp at which the agent is seen interacting with a driver for an escort to the police station and the timestamp of the agent's next interaction at the intersection. Panel B analyzes the effect of the quota on the daily occurrence of accidents per intersection and the daily occurrence of traffic jams per intersection, split by high and low risk of traffic jams intersection-hour blocks, and by market day and non-market intersection-day block. To construct high vs. low risk of traffic jam intersection-hour blocks, we estimate the share of traffic jams for each intersection-hour and define intersection-hour blocks above the 50 percent quantile in the sample as "High risk", and those below the 50 percent quantile as "Low risk". "Market" is an indicator taking value one for Fridays and Saturdays on the avenues linking Angola to the central market. In those days, there is a known large influx of drivers coming from Angola to the markets in Kinshasa, affecting disproportionately a sub-set of the intersections, resulting in traffic jams. We report the 2SLS coefficient, as well as the effective F-statistic of the first stage following Olea and Pflueger (2013). We include randomization block (team of agents/intersection) fixed effects (Randomization block FE) and day fixed effects (Day FE) in all columns. Dep. var. mean (no encouragement) and Dep. var. mean (encouragement) report the mean of the dependent variable for the regression sample without and with the quota reduction *encouragement*. The experimental sample covers 337 teams of agents/intersections-day observations, which are also the units of assignment, 327 of which have non-missing quota level. Observations for which the dependent variable are missing are dropped. There is no selection of data missing on treatment assignment. **Source:** street observers' records of events.

8. Effect of The Quota on The Second Mandate: Enforcement

In this section, we analyze the effect of the quota scheme on the targeting of drivers by the agents, and on the types of charges alleged by the managers, in order to examine whether the quota has a social benefit, through its effect on the incentives for drivers to comply with the code, that may compensate the social cost documented for traffic outcomes at the affected intersections.

To guide the empirical analysis, we examine the two testable implications of our model using the random variation generated by the experiment. The role of extortion is central in determining whether the escorting induced by the quota has a socially valuable effect. First, if the system is based on extortion, then it must be that a higher quota level induces the agents to target drivers who are most likely to yield a bribe if they are successfully charged. Second, this targeting destroys the effect of detainment effort on the drivers' incentive to comply if, and only if, the number of false charges issued by the managers in response to a higher level of the quota is larger than the number of true charges.

A. *The Quota Leads Agents to Target High Bribe Drivers*

We first examine whether the quota incentivizes agents to target high-bribe drivers—Prediction 2a. As shown in Section 4, unprotected drivers have a significantly large yield, and taxi drivers comprise the largest portion of unprotected drivers. Taxi drivers are also very easy to identify in the street. Thus, if the agents are aiming to escort drivers with a high expected bribe yield upon being charged, they would target drivers who do not have a protector, especially taxis.

We analyze this prediction in Panel A of Table 4. We estimate Equation 2, where the dependent variable is the number of drivers escorted (of a particular type) by the team of the corresponding intersection in the day. Columns (1) and (2) show that the quota leads to an increase in the number of escorted drivers, entirely through its effect on escorts of unprotected drivers. Specifically, Column (1) shows that a one-unit increase in the quota level increases the number of unprotected drivers that are escorted by .34. Column (2) shows that, in contrast, the number of protected drivers that are escorted does not increase (the coefficient is even negative). Given that unprotected drivers represent 79% of the drivers when there is no quota reduction *encouragement* (rather than 100%), this suggests that the quota induces agents to target the drivers expected to yield a high bribe if they are charged.

We have shown that taxis have the highest concentration of unprotected drivers. Thus, Columns (3) and (4) use the number of taxi drivers and non-taxi drivers escorted as dependent variables, respectively. The entire effect of the quota arises through an increase in the number of taxis escorted (Column 3). In contrast, the quota has no effect on the number of non-taxis escorted (Column 4). Column (5) uses the number of unprotected drivers escorted as dependent variable and controls for the number of taxi drivers escorted. The coefficient on the quota level vanishes, and the coefficient on the taxi variable is statistically significant and close to one, thus the effect of the quota on escorting unprotected drivers is entirely channeled through taxis. Column (6) does the reverse. In this case, both coefficients are large and significant, indicating that the quota induces agents to target taxi drivers and confirms that those are least protected.

The evidence shown in Panel A of Table 4 shows that the quota scheme leads to the escorting of taxi drivers, who are vulnerable to paying a bribe due to their weak protection, and who are easy to detect. This provides supporting evidence for implication 2a.[71] However, the expected bribe yield of a driver may depend on more than these two observable characteristics. In Table A6, we use Logit and OLS (Panel A), and Lasso (Panel B) to generate a predicted bribe yield using *all* of the observable characteristics of a driver, and estimate Equation 2 using, as dependent variables, average predicted bribe yield of escorted drivers and the number of high yield drivers escorted.[72]

Columns (1) and (2) show that a higher quota increases the predicted probability of paying a bribe for escorted drivers, and that it has no effect on the predicted probability of paying a fine of escorted drivers. Columns (3)-(6) show that a higher quota level leads to a strong increase in the number of escorted drivers whose predicted bribe, as predicted by their observable characteristics, is above the median predicted bribe level in the intersection-hours not assigned to the quota reduction *encouragement*. It leaves unaffected the number with a predicted bribe below that median. Furthermore, the quota has no effect on the number of escorted drivers with a predicted fine above that median, and increases those with a predicted fine below.

The analysis in this section suggests that the quota induces agents to target drivers who yield a high bribe if they are charged, which tends to also correspond to drivers who yield a low fine.

[71]Figure A18 in the Online Appendix presents the reduced form coefficients. It confirms that reducing the quota leads to a reduction of escorts of drivers who are unprotected, and to a reduction of escorts of taxi drivers.

[72]We include all the variables we collected in the prediction: indicators for whether the driver has an infraction, for whether the infraction is verifiable, for whether the driver is protected, for different car types (taxi, jeep, minibus, motorbike, private car), for whether a protector belongs to a significant institution (police, army, auditoriat), for whether a protector belongs to a major rank (colonel, major, sergeant), and the type of observer and the hour blocks at which the driver traveled.

B. ***The Quota does not Strengthen the Incentives of Drivers to Comply with the Code***

We now analyze implication 2b, namely whether a higher level of the quota increases the fraction of (threat of) false charges in the set of charges JPOs and drivers negotiate over.

We begin our analysis examining the 2,252 alleged infractions that the JPOs threaten to charge the drivers with at the police stations. This data does not allow us to distinguish true from false allegations, because it is reported by officers inside the police station, only after the alleged infraction was made by the driver. However, it is the most reliable and comprehensive indirect data about the alleged infractions concerning the likelihood that they are true. Specifically, we classify the alleged infractions by whether the allegations are verifiable by a third party. Some alleged infractions, such as actions taken by the driver at the intersection, hinge on the report made by the agent. Others, for example the driver not owning a licence, could be verified by any third-party. In Section 4, we have shown that, of the 2,252 alleged infractions observed in the observational sample, 56% were unverifiable. Verifiable allegations are unlikely to be false, since drivers can complain to other authorities and thus it is often not desirable to accuse a driver of an infraction that can be proven wrong. Unverifiable allegations, such as dangerous maneuver, are subject to the discretion of the agents in the street, thus can be fabricated.

We analyze this prediction in Panel B of Table 4. We estimate Equation 2. Column (1) shows that a one-unit increase in the level of the quota is associated with a .5 increase in the number of drivers who are alleged to have made an unverifiable infraction. Columns (2) and (3) show that this result holds irrespective of whether we control for the number of taxi drivers escorted or the number of unprotected drivers escorted. In Columns (4)-(6), the dependent variable is the number of drivers escorted alleged to have made a verifiable infraction. In contrast to unverifiable allegations, the quota has no statistically significant effect on the number of drivers escorted to the station accused of making a verifiable infraction. The coefficients without controls (columns 1 and 4) imply that a one-unit increase has a 2.8 times larger effect (6 times larger controlling for the number of unprotected drivers, and 2 times larger controlling for the number of taxis) on the number of drivers escorted with unverifiable allegations than on those with verifiable ones.[73]

These estimates imply that between 63% (0.233/(0.233+0.134)) and 86% (0.303/(0.303+0.049)) of alleged infractions induced by the quota are unverifiable—74% for the coefficient without controls. If unverifiable infractions were all false, this alone would show that the quota destroys

[73] Figure A19 in the Online Appendix presents the reduced form coefficients.

Table 4: Effect of the Quota on Types of Drivers Escorted and on Types of Allegations

Panel A. Number of Drivers Escorted Who are Likely to be High-Bribe

	Dep. var: Escorts #					
	Unprotected (1)	Protected (2)	Taxi (3)	Non-taxi (4)	Unprotected (5)	Taxi (6)
Quota level	0.340**	-0.0273	0.318***	-0.0155	0.0601	0.199**
	(0.146)	(0.0719)	(0.0955)	(0.128)	(0.129)	(0.0820)
# Taxi					0.879***	
					(0.0810)	
# Unprotected						0.352***
						(0.0336)
First-stage F-statistic	81.70	81.70	81.70	81.70	72.06	76.09
Randomization block FE	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes
Dep. var. mean (no encouragement)	6.29	1.84	2.70	5.40	6.29	2.70
Dep. var. mean (encouragement)	5.36	2.04	1.48	5.91	5.36	1.48
Observations	289	289	289	289	289	289

Panel B. Number of Alleged Infractions That are Likely to be False

	Dep. var: Escorts #							
	Unverifiable			Verifiable			Open ended	
							False	True
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quota level	0.503***	0.233**	0.303***	0.180	0.134	0.0490	0.0324*	0.115
	(0.132)	(0.108)	(0.109)	(0.134)	(0.141)	(0.128)	(0.0177)	(0.100)
# Taxi		0.872***			0.147			
		(0.0765)			(0.1000)			
# Unprotected			0.548***			0.358***		
			(0.0517)			(0.0605)		
First-stage F-statistic	122.76	109.89	114.85	122.76	109.89	114.85	82.07	82.07
Randomization block FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dep. var. mean (no encouragement)	5.09	5.09	5.09	3.59	3.59	3.59	0.10	1.22
Dep. var. mean (encouragement)	3.98	3.98	3.98	3.45	3.45	3.45	0.03	0.92
Observations	243	243	243	243	243	243	319	319

Notes: This table analyzes the effect of the quota on the types of escorts. We estimate $\hat{\beta}_Q^{2SLS}$ in Equation 2. In Panel A, the dependent variable in columns (1) and (5) is the daily number of unprotected drivers escorted to police station per intersection, in column (2) it is the daily number of protected drivers escorted to the police station per intersection, in columns (3) and (6) it is the daily number of taxi drivers escorted to the police station per intersection, and in column (4) it is the daily number of non-taxi drivers escorted to the police station per intersection. Columns (5) and (6) control for the daily number of taxi drivers escorted and unprotected drivers escorted, respectively. In Panel B, the dependent variable in columns (1) and (3) is the daily number of drivers escorted to the police station per intersection who were accused of having committed an infraction that would be unverifiable by a third-party. In Columns (4) and (6), the dependent variable is the daily number of drivers escorted to the police station per intersection who were accused of verifiable infractions. A verifiable infraction is an accusation that could be verified by a third party, such as having no driving licence; an unverfiable infraction is an accusation that relies on the testimony of the police agent, such as conducting a dangerous maneuver, and is often the result of a forged allegation. In Columns (7) and (8), the dependent variable is the daily number of drivers escorted to the police station per intersection that were accused of making an infraction that was reported to be *false*, or *true*, in the open-ended answers provided by the street observers, respectively. Street observers, who were placed at the intersections and hence witnessed the alleged crimes, answered the question "Describe the interaction you just saw" for each agent-driver interaction. A true infraction is an accusation that the observers confirmed to be a true accusation; a false infraction is an accusation that the observers confirmed to be forged, and thus would amount to extortion. Columns (2) and (5) control for the daily number of taxi escorts. Columns (3) and (6) control for the daily number of unprotected escorts. We report the 2SLS coefficient, as well as the effective F-statistic of the first stage following Olea and Pflueger (2013). We include the randomization blocks (team of agents/intersection) fixed effects (Randomization block FE) and day fixed effects (Day FE) in all columns. Dep. var. mean (no encouragement) and Dep. var. mean (encouragement) report the mean of the dependent variable for the regression sample without and with the quota reduction *encouragement*. The experimental sample covers 337 teams of agents/intersections-day observations, which are also the units of assignment, 327 of which have non-missing quota level. To examine official and unofficial police station data, we further restrict to the intersection-days for which the JPO and FCA records existed both in the scans of the original source and in the originally data entered in surveycto from the original source, resulting in the loss of 30 additional observations. In addition, observations of this sample for which the dependent variable are missing are dropped. See Supplemental Study Documentation, Section 1 for a detailed description. There is no selection of data missing on treatment assignment. **Source:** police station observers (JPO and FCA); Panel B column (7) and (8) street observers.

the incentives of drivers to comply to the code, as it would increase the fraction of false charges.

This increase in unverifiable allegations is also unusually large when compared to the prevalence of unverifiable allegations were the quota level to be smaller. With the quota reduction encouragement, the fraction of unverifiable allegations is 53.5% in the experimental sample, as seen by the means of the dependent variables reported in Table 4 (3.98/(3.98+3.45)). This is substantially smaller than 74%, the fraction of unverfiable allegations in the set of allegations induced by the quota increase, suggesting that the quota distorts the type of alleged infractions sought by the agents compared to that which would prevail in the absence of the quota. That is, the quota induces the agents to produce unverifiable allegations at an *unusually* high rate.

However, unverifiable allegations may have characteristics other than being false. Thus, this increase may reflect that the quota leads agents to target drivers who have committed true infractions with characteristics that also tend to be unverifiable rather than being false. We thus complement this analysis with direct reports of false allegations from third-parties witnessing the alleged crimes. Observers stationed at the intersections detailed each of 13,254 interactions between agents and drivers in open-ended answers to the question "*Describe the interaction you just saw*." We manually analyzed each report to identify escorting attempts based on false allegations. The mean dependent variables reported in Columns (7) and (8) show that, with a quota half the natural quota, the number of alleged infractions reported by our observers as true is 31 times that of false ones. In contrast to the predominance of true allegations, the quota has no statistically significant effect on the number of infractions reported to be true, but has a statistically significant effect on that of allegations reported as false. The magnitude of the coefficients indicates that, compared to the level that would prevail if the quota were half its natural level, a one-driver increase in the quota increases true infractions in 12.5% (0.115/.92), not statistically significant, and false infractions by 108% (.0324/.0300), significant at the 10% level. This is consistent with the quota increasing false allegations more than true ones.[74]

In sum, this analysis suggests that the social cost created by the quota through worse traffic outcomes is not matched by better incentives of drivers to comply. That is, on net, it is costly.

[74]We have shown that the quota worsens traffic conditions at the intersections. It is thus possible that the type of infractions drivers are induced to make as a result of the different driving conditions may also be different, which could generate this result even if agents' production of allegations were unchanged. To examine whether the increase in unverifiable and false allegations could be explained by the traffic conditions, we replicated 2 including, as controls, the occurrence of traffic jams and accidents. The result is identical, with the relative effect on unverifiable and false allegations accentuated. Since this control is endogenous and hence a "bad control," the main coefficient's size does not have a causal interpretation. However, the fact that its inclusion leaves the coefficients unaffected and their relative magnitudes accentuated is conclusive that the quota does not influence the type of alleged infractions through its effect on traffic outcomes and the effect of traffic outcomes on the types of infractions that drivers actually make.

9. Significance of the Quota in the Manager's Demand for Unofficial Revenue

Having shown that the quota scheme is costly, in this section, we interrogate whether the quota is a tool for corruption, or instead, for other purposes but incidentally enriches commanders.

First we analyze how the quota affects police station revenue generation. Rather than serving as a tool for private profit-making by generating bribes, the quota may serve as a fine generating tool, increasing public revenue. Table 5 estimates Equation 2, using the revenues generated at the police station as dependent variable. We separately analyze all daily revenue (bribe and formal fine), bribe revenue, and formal fine revenue, in Columns (1)-(3) of each panel, respectively. In Panel A, we analyze the effect of the quota on the total Dollar revenue (official and unofficial), and we decompose this effect into the number of drivers escorted in Panel B and the level of the average positive payments observed in Panel C. Panel A shows that a one-unit increase in the quota level increases the total Dollar revenue at the police station by 10.54 USD. Almost all of that increase arises from an increase in the bribe revenue (8.314 USD), which is statistically significant at the 5% level. The quota, however, has no statistically significant effect on the formal fine revenue generated by the corresponding police station. Panels B and C show that this effect is entirely driven by the number of drivers escorted to the police station. Panel B shows that, while a one-driver increase in the quota is associated with a .4 increase in the number of drivers escorted to the police station (Column 1), this increase is almost exclusively driven by the drivers who end up paying a bribe: Column (2) shows that a one-driver increase in the quota corresponds to an increase of .355 drivers who pay a bribe in the police station, statistically significant at the 1% level. Column (3) shows that the quota level is unrelated to the number of drivers who pay a formal fine. Panel C shows that the increase in bribe revenue documented in Panel A is not driven by a change in the average level of bribes paid.

In sum, Table 5 shows that the quota is intimately related to escorting drivers who end up paying a bribe, and that this translates into increased bribe revenue at the police station—but it is entirely unrelated to the formal fines. This suggests that the quota is, essentially, an instrument for generating corruption revenue rather than official public revenue.[75]

Second, we examine whether using the quota is collectively rational for the manager and the agents to maximize unofficial revenue. This is important to establish because if the choice to use the quota for contracting between the manager and the agent reflects that they face contracting

[75] Figure A20 in the Online Appendix shows the reduced form results.

frictions, such as agent private information over the level of the bribes they may take in the street, or agent liquidity constraints, then without a proper accounting for why the quota exists in the first place, these results may be less generalizable. In principle, if neither the manager nor the agent is risk-averse, if neither of them faces a wealth constraint, if everything is public information, and if both are equally good at extracting a bribe from drivers, it would be natural to expect the manager to simply lease out the intersection to the agent in exchange for a fee. Given that we have documented that their contract relies on a quota of drivers, there are two families of rational explanations for why they may have chosen to contract using the quota.

The first family is that contracting frictions prevent the manager and the agent from designing a contract that would maximize their joint surplus from corruption. For instance, if the agent is risk-averse, leasing out the intersection is known to be sub-optimal, as the agent would internalize all the risk. In that case, a sharecropping agreement or insurance contract (e.g. transferring a share of the risk to the manager such as the quota), would emerge which, if the agent has private information, could dis-incentivize the agent. An extreme version of this contracting friction is if the agent has a wealth constraint and is unable to pay for the lease in advance, but the bribe revenues made by the agent are private information. In that case, the manager could, in some cases, prefer to destroy surplus by allocating drivers to the manager directly (e.g. by requesting a quota), because he cannot trust the agent's report at the end of the day on the bribe revenues made. In this family of explanations, the quota would be introduced at a level that destroys the sum of corruption revenues made by the manager and by the agent. In that case, while reducing the quota from its equilibrium would reduce the manager's profits, it would increase the revenues made by the agent from bribes by a larger amount.

The second family of explanations is that the manager is simply more effective at extracting bribes from the drivers directly. For instance, the manager is better connected, and can exert more credible threats on the drivers than the agents themselves. Managers have the power to hold the drivers at the police station for a longer amount of time without it being costly for traffic, allowing them to solve some of the drivers' wealth constraints that may reduce their ability to pay on the spot; or the manager may have the power by law to impose charges, and thus be better able to make and negotiate threats; or it may be too costly for agents to negotiate bribes at the intersections, leading to even more traffic congestion and accidents than escorting drivers causes; or it could be too risky for agents to take bribes in the street, as they could be arrested for bribery. Whatever is the mechanism making the use of the quota first best from the perspective

Table 5: Effect of the Quota on Total Corruption and Fine Revenue

Panel A. *Revenue*: Police Station Revenue

	Dep. var: Revenue (USD)		
	All	Bribe	Fine
	(1)	(2)	(3)
Quota level	10.54**	8.314**	2.225
	(4.914)	(3.436)	(2.802)
First-stage *F*-statistic	76.16	76.16	76.16
Randomization block FE	Yes	Yes	Yes
Day FE	Yes	Yes	Yes
Dep. var. mean (no encouragement)	183.42	136.69	46.73
Dep. var. mean (encouragement)	153.97	114.28	39.69
Observations	261	261	261

Panel B. *Quantity*: Number of Drivers Escorted to the Police Station

	Dep. var: Quantity (of drivers)		
	All	Bribe	Fine
	(1)	(2)	(3)
Quota level	0.400**	0.355***	0.0323
	(0.158)	(0.133)	(0.0576)
First-stage *F*-statistic	79.26	79.26	79.26
Randomization block FE	Yes	Yes	Yes
Day FE	Yes	Yes	Yes
Dep. var. mean (no encouragement)	8.33	5.69	0.97
Dep. var. mean (encouragement)	7.50	4.78	0.89
Observations	275	275	275

Panel C. *Price*: Value of the Payments for Drivers Who Pay

	Dep. var: Price (USD, > 0)		
	All	Bribe	Fine
	(1)	(2)	(3)
Quota level	-0.00679	-0.435	0.377
	(0.501)	(0.352)	(0.790)
First-stage *F*-statistic	75.39	72.92	46.18
Randomization block FE	Yes	Yes	Yes
Day FE	Yes	Yes	Yes
Dep. var. mean (no encouragement)	20.91	21.13	47.14
Dep. var. mean (encouragement)	20.05	22.06	41.70
Observations	242	239	123

Notes: This table presents the estimates of $\hat{\beta}_Q^{2SLS}$ in Equation 2. In Panel A, the dependent variable is the daily total revenue (USD) made at the police station through payments made by drivers inside the police station, per intersection of origin of the driver, broken by unofficial (bribe) revenue and official (fine) revenue. In Panel B, the dependent variable is the daily number of drivers escorted to a police station per intersection of origin who make a payment, broken by drivers who pay a bribe and those who pay a fine. In Panel C, the dependent variable is the revenue per driver escorted, in USD, for each driver escorted to the police station who makes a payment, broken by drivers escorted who pay a bribe, and drivers escorted who pay a fine. The data in this panel is restricted to payments by drivers who make a strictly positive payment. We report the 2SLS coefficient, as well as the effective F-statistic of the first stage following Olea and Pflueger (2013). We include the randomization block (team of agents/intersection) fixed effects (Randomization block FE) and the day fixed effects (Day FE) in all columns. Dep. var. mean (no encouragement) and Dep. var. mean (encouragement) report the mean of the dependent variable for the regression sample without and with the quota reduction *encouragement*. The experimental sample covers 337 teams of agents/intersections-day observations, which are also the units of assignment, 327 of which have non-missing quota level. To examine official and unofficial police station data, we further restrict to the intersection-days for which the JPO and FCA records existed both in the scans of the original source and in the originally data entered in surveycto from the original source, resulting in the loss of 30 additional observations. In addition, observations of this sample for which the dependent variable are missing are dropped. There is no selection of data missing on treatment assignment. See Supplemental Study Documentation, Section 1 for a detailed description. **Source:** police station observers (JPO and FCA).

of the manager-agent pair, this family of explanations would imply that a reduction in the quota would decrease the joint surplus from corruption generated by the pair.

To discriminate between these two families of explanations, we analyze the effect of the quota on the joint surplus from corruption. Table 6 performs this analysis. Columns (1) - (3) estimate Equation 2, using the payments made by drivers directly to agents in the street as dependent variable. If the quota is second best, then, using our experimental reduction of the quota, we should find that a one-driver increase in the quota is associated with a decrease in bribe revenues in the street that is larger than the increase in bribe revenues at the station. If the quota is first best, however, the decrease can be smaller, or it may not even lead to any decrease. Column (1) shows that the quota does not decrease the revenue made by agents from tracasserie bribes at the intersections. The coefficient is negative and insignificant. Column (2) shows that the toll fees and tips are also unaffected by the quota. The coefficient is positive and insignificant. Column (3) shows that, overall, the bribe revenue by the agents in the street is unaffected. The dependent variable in Column (4) is the total bribe revenue generated by the team of agents-manager pairs. Columns (1)-(3) showed that the quota had no effect on the corruption revenue generated by the agents in the street, but the coefficients on the different components were opposite. The quota significantly increases total corruption revenue generated by the agents'-manager pairs.[76]

What these two sets of explanations have in common is that the scheme hinges on the inability of drivers to pay the agents in anticipation of the bribes and time waste that they would incur if they are escorted. Our qualitative interviews indicate that, except for the few wealthy drivers who sometimes pay a tip in the street, private drivers often have low liquidity. Hence, they are also unable to pay in the street. This feature of Kinshasa reflects the "survival economy" of the city, whereby most residents start the day with no or limited savings, and go through the day in order to find income. Liquidity constraints thus can explain, according to our interviews, the failure of the Coasean bargain between the private drivers who are escorted and the agents who escort them.[77] Public transport drivers accumulate cash naturally as part of their job, especially taxi and minibus drivers. However, these drivers are almost never the owners of their car. Since the bribes paid by the driver in the street are private information to the driver, many drivers cannot credibly convey to their owner that they paid a bribe. Since the owner is routinely called in to negotiate the bribe after an escort, this could explain failure of the Coasean bargain.

[76]Figure A21 in the Online Appendix presents the reduced form estimates, separately estimated for different sources of street bribe revenue. The conclusions are identical.

[77]This may also explain why in wealthier so-called emerging economies, quota systems are designed in cash.

Table 6: The Quota as a Corruption Surplus Maximization Contract

	Dep. var:			
	Revenue From Street (USD)			Total Corruption (USD)
	Harassment Bribe	Toll Fee and Tip	(1) + (2)	Bribe Revenue + (1) + (2)
	(1)	(2)	(3)	(4)
Quota level	-0.291	0.482	0.191	8.407**
	(1.306)	(1.546)	(2.116)	(4.222)
First-stage *F*-statistic	75.28	75.28	75.28	75.28
Randomization block FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
Dep. var. mean (no encouragement)	10.89	46.00	56.89	193.48
Dep. var. mean (encouragement)	11.89	43.74	55.63	169.95
Observations	256	256	256	256

Notes: This table analyzes the effect of the quota on street and total corruption revenue. We present the estimates for $\hat{\beta}_Q^{2SLS}$ in Equation 2. In Columns (1)-(3), the dependent variable is the daily police revenue generated in the street, broken by tracasserie bribes, and toll fees and tips. In Column (4), the dependent variable is the daily total corruption revenue, constructed as the sum of the police station bribe revenue analyzed in Table 5 Panel A and the police revenue from the street in Column (3) of this table. We report the 2SLS coefficient, as well as the effective F-statistic of the first stage following Olea and Pflueger (2013). We include the randomization block (team of agents/intersection) fixed effects (Randomization block FE) and the day fixed effects (Day FE) in all columns. Dep. var. mean (no encouragement) and Dep. var. mean (encouragement) report the mean of the dependent variable for the regression sample without and with the quota reduction *encouragement*. The experimental sample covers 337 teams of agents/intersections-day observations, which are also the units of assignment, 327 of which have non-missing quota level. To examine official and unofficial police station data, we further restrict to the intersection-days for which the JPO and FCA records existed both in the scans of the original source and in the originally data entered in surveycto from the original source, resulting in the loss of 30 additional observations. In addition, observations of this sample for which the dependent variable are missing are dropped. See Supplemental Study Documentation, Section 1 for a detailed description. There is no selection of data missing on treatment assignment. **Source:** street observers' records (Columns 1-3) and JPO and FCA observers (Column 4).

In sum, managers use the quota to increase their corruption revenue, not revenues from fines. This also maximizes the joint surplus from corruption when drivers cannot pay it off.

We showed that managers used the quota to fulfill their demand for unofficial revenue, and that the quota is socially costly. However, in reducing the quota and compensating managers for its reduction, we also reduced managers' demand for unofficial revenue. If, in order to satisfy their demand, managers were able to extract a share of the unofficial revenue collected by the agents rather than requesting a quota of drivers, there is no guarantee that the costs of manager's demand, arising from more effort by the agents to collect bribes, may be the same. Stopping drivers, harassing them, using violent tactics, and using effort to negotiate away from traffic management would likely have similar effects if the agents were induced to collect bribes for the managers themselves. In that case, our results continue to indicate that manager's demand creates social costs orders of magnitude larger than those created by the agents' corruption alone. On the other hand, the social costs of manager's demand for unofficial revenue are almost surely larger with the quota since, as we have shown, the quota creates agent absenteeism, as agents are escorting drivers to a station far away, and act as witnesses in the station. This effect would be mitigated if manager's demand was channeled through taking a cut of agents' bribes' revenue.

10. Conclusion

This study documents the real but unofficial system of revenue generation inside the traffic police agency (i.e. corruption), providing a novel and extensive picture of how a system of corruption operates. After three years of fieldwork in which trust relationships were nurtured, we trained and worked with 160 individuals to implement six independent wide-casting research operations in the agency. Our collaboration with these individuals allowed us to obtain an unprecedented snapshot of the inner workings of a state agency in which corruption has spread through the hierarchy. We quantify, for the first time, an example of "*real governance*" inside a state agency, depicting how the *real* state operates. The system of corruption involving managers generates significant revenue for the traffic police agency and directly worsens traffic outcomes, while it does not appear to incentivize drivers to comply with the driving code—additional arrests caused by the system are likely driven by false allegations. Organizing corruption as a system with manager participation imposes costs beyond those which would exist with individual corruption.

Specifically, leveraging these data collection efforts, we document that the pillar of unofficial revenue generation is a so-called *quota scheme* that would be invisible to the external observer, whereby the manager requests that agents escort drivers to the manager for the manager to extract bribes. Most of the corruption revenues arise from this scheme. In addition, we conducted a one of a kind experiment *with* the agency's schemes of corruption. With appropriate care for obvious ethical challenges that we describe in Supplemental Ethics Appendix, we experimentally reduced the manager's demand for unofficial revenue through the manager's main tool for corruption to analyze its effect on society.

Using this experiment, we analyzed the social cost of this scheme. The scheme alone is accountable for most traffic jams observed at the intersections, and almost all accidents. Simple back-of-the-envelope calculations suggest that drivers would be willing to pay more than the manager obtains through the scheme in order to prevent the traffic jams and accidents it creates. The incentives of managers to take bribes thus influence the behavior of the agents in ways that are invisible to the external observer, and cause a major social cost.

We then analyzed the implications of the scheme on the second mandate of the agency: traffic code enforcement. If the quota scheme made it costlier for drivers to violate the law by increasing the expected cost increase they face if they violate the law, its effect on traffic jams may be compensated by a social gain. Our data suggests that the scheme is fueled by the agency's ability to use extortion, with the agency fabricating a large number of alleged infractions. We found that the quota scheme translates into a disproportionate increase in the number of charges that are almost surely false intended to generate profits, consistent with the scheme destroying the drivers' incentives to comply with the code. We then turned to interrogate the significance of the quota for corruption. After all, the quota may just be a tool for the generation of public revenue from fines. We found that the opposite is true: the quota is used for the generation of corruption revenue at the stations. This revenue does not come at the expense of bribes taken by agents in the street. This provides reassurance that the social cost created by managers' demand for bribes does not hinge on context-specific manager-agent contracting frictions.

While the explanations for this institutional design are beyond the scope of the paper, we have suggested that its existence hinges on the fact that a significant share of drivers is unable to pay—either because they have low liquidity, or because they do not own the vehicle. This failure of the Coasean bargain, which underpins a share of the social costs we document, is solved by other drivers—those who are able to develop relationships with the agents based on a toll fee system. The toll fee system can solve problems of drivers liquidity constraints and of private information vis a vis their owners, enabling them to forego the time waste created by escorting. In ongoing research, we are currently examining the effect of removing, and creating, repeated interaction between a sub-set of drivers and the police agents to quantify the economic benefits of the toll fee syste, and the extent to which they reduce certain costs of corruption.

One of the responses to corruption most commonly discussed is that of providing efficiency wage to state officials above their outside option: if the risk of detection and dismissal is sufficiently large, state officials could be deterred with a sufficiently high wage. A problem with this family of interventions is that, with more income by the agents, the managers may just request a higher quota or even begin taking a cut of the agents' income. In that case, the effect of such interventions will depend on the bargaining power of the manager to extract a share of that increase. In ongoing research, we are analyzing the effect of a randomized one-off cash transfer to the agents on the rate of "taxation" by the managers, and tracing how much is taken by the managers. Consistent with the existence of a real state, we find that the manager taxes 30% of such income, but the taxation occurs almost only when the cash transfer produces inequality between teams of agents, consistent with the distribution of unofficial income being important in the preservation of the system.

This paper also opens up a possibility beyond the scope of this study. The opportunities of the manager could be leveraged to correct inefficiencies created by agents' corruption – a second best argument. If the agent has weak incentives to detain drivers who commit infractions, for instance, or if the agent uses extortion, then appropriately making it costlier for the manager to engage in extortion, but allowing the manager to benefit from drivers escorted could in some cases amount to a pay for performance system that could re-align the performance of the agency. Smart interventions that leverage corruption or implement targeted legalizations, rather than just combating it for being illegal remain an intriguing avenue for future research.

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Mathematical Appendix

Proof of Proposition 1 We solve the problem by backward induction. The agent's reaction function is determined by the agent's first order condition with respect to e_T. It is straightforward to see that:

$$e_T^* = \frac{\beta}{2} - e$$

The manager's problem becomes:

$$\max_{e,s} y(e)b(s(\sigma_{vb} + (1-\sigma_{vb})\alpha) + (1-s)(\sigma_{bv})) + \frac{\beta^S \beta^A}{2} - \beta^S e$$

The manager's first order condition with respect to e is:

$$y'(e)b(s(\sigma_{vb} + (1-\sigma_{vb})\alpha) + (1-s)(\sigma_{bv})) - \beta^S = 0$$

Hence,

$$e^* = h(\frac{\beta^S}{b\left(s(\sigma_{vb} + (1-\sigma_{vb})\alpha) + (1-s)(\sigma_{bv})\right)})$$

Without specifying $c(e_T,e)$, from the agent's maximized level of e_T^*, we can get

$$\frac{de_T^*}{de} = -\frac{c_{Te}(e_T,e)}{c_{TT}(e_T,e)} < 0$$

since we assume $c_{Te}(e_T,e) > 0$ and $c_{TT}(e_T,e) > 0$. □

Proof of Proposition 2 First, we show that the manager will order the agents to allocate all escorting effort towards drivers with $b_i = 1$ if, and only if, the marginal benefit to the manager of an additional unit of s is positive. The manager's first order condition with respect to s is:

$$\frac{\partial u^S}{\partial s} > 0$$

Which holds if, and only if:

$$\sigma_{vb} + (1-\sigma_{vb})\alpha - \sigma_{bv} > 0$$

which is equivalent to

$$\alpha > \frac{\sigma_{bv} - \sigma_{vb}}{1-\sigma_{vb}}$$

Then, we show that a higher level of s dis-incentivizes drivers to comply with the regulation. To see this, consider the expected payment by a driver who has committed a true infraction, and compare that to that of a driver who did not commit a violation. There are two cases: either the agent is focusing fully on drivers who can be induced to pay a bribe ($s = 1$); or she is focusing on those who have committed an infraction ($s = 0$).

In the first case ($s = 1$), the probability that a randomly selected driver who has committed a true infraction is escorted is $\sigma_{bv}e$, as only fraction σ_{bv} of drivers committed an infraction and, of those, the agent only attempts to escort fraction e. The driver's expected cost for these drivers is thus $\sigma_{bv}e(b)$. Since they have committed a true infraction, all of those escorted will be induced to pay a bribe. In contrast, the expected cost to a driver who made no true infraction is $\sigma_{b\neg v}e(\alpha b)$. Here, only fraction α will pay a bribe, since with no charge, they do not pay a bribe.

In reality, it is reasonable to assume that drivers who would yield a bribe if they have committed an infraction are less likely to find it optimal to commit an infraction, compared to those who would not yield a bribe (e.g., because they are protected). Hence, a more realistic assumption would be $P(b = 1|v = 1) < P(b = 1|v = 0)$, i.e. $\sigma_{bv} < \sigma_{b\neg v}$ [78]. This would further amplify the conclusions in this section that the wedge in the expected cost is reduced by α, and implies that, even when α is less than one, the resulting wedge could be zero. Indeed, the wedge in this case is $\Delta_1 = eb\left(\sigma_{bv} - \alpha\sigma_{b\neg v}\right)$. This means that an additional unit of effort escorting decreases the wedge, in that case, if and only if $\alpha > \frac{\sigma_{bv}}{\sigma_{b\neg v}}$.

In the second case ($s = 0$), the same reasoning shows that the difference in the expected costs when committing a true infraction vs. not committing an infraction is $\Delta_2 = e(C^E + b) > 0$. That is, when the agent is focusing on drivers who have committed an infraction, the correlation is larger than when the agent focuses on drivers who can be induced to pay a bribe.

When $\alpha > \frac{\sigma_{bv} - \sigma_{vb}}{1 - \sigma_{vb}}$, the manager will choose $s = 1$. In this case [79], specifically when $\alpha > \frac{\sigma_{bv}}{\sigma_{b\neg v}}$, there are no incentives to comply for a hypothetical driver choosing whether to comply or not. Manager corruption creates a social cost since $\frac{de_T^*}{de} < 0$ from Proposition 1 and that cost is not compensated by an increase in the incentives to comply.

□

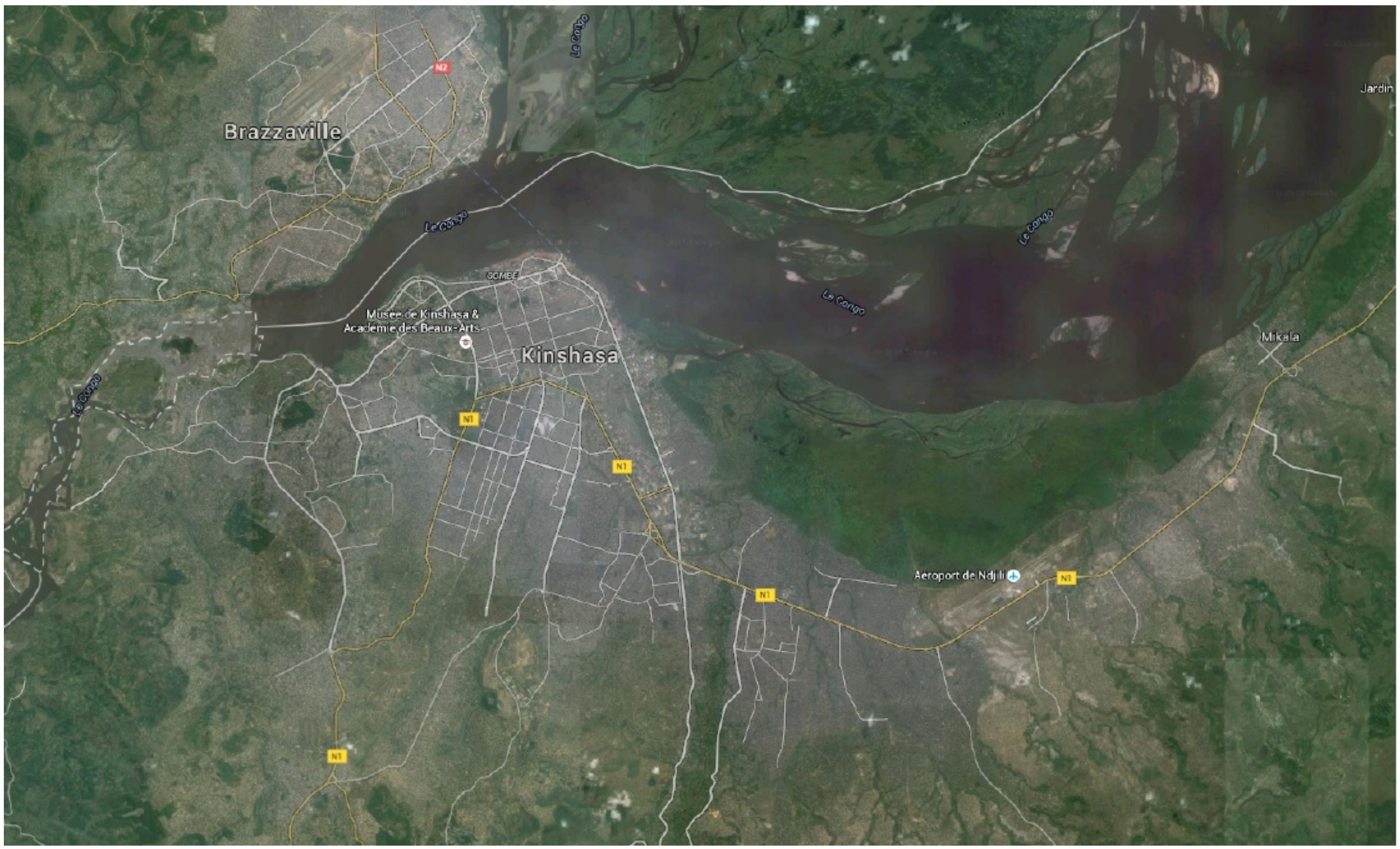
[78] If $\sigma_{bv} = \sigma_{b\neg v}$, the wedge is $\Delta_1 = e\sigma_{bv}[(1 - \alpha)b]$. Clearly, the better the manager is at forging infractions, the lower the correlation between making an infraction and the expected cost. In the extreme, if the manager can arbitrarily make charges, the correlation is zero.

[79] If $\sigma_{bv} = \sigma_{b\neg v}$, then $\Delta_1 = 0$, where there are still no incentives to comply for a hypothetical driver.

For Online Publication—Online Appendix

Appendix A. Appendix Figures

Figure A1: The City of Kinshasa



Notes: Map of the city of Kinshasa. The river Congo separates Brazzaville, the capital of the Republic of the Congo (North side) from Kinshasa, the capital of the Democratic Republic of the Congo (South side). **Source**: Google maps.

Figure A2: One Roundabout Controlled by the Battalion

Notes: Image of one of Kinshasa's roundabouts, where traffic is controlled by agents of the traffic police battalion. The roundabout is home to four teams of agents, who are deployed to four different intersections/street-corners. **Source**: Oia Photography.

Figure A3: Bribes in the Street, the "*Mbote Ya Likasu*" Handshake

Notes: This figure shows an example of the Mbote Ya Likasu handshake, which is made very quickly to avoid being observed. This involves very little money (50 cents) and is only applicable to the drivers who the agents can trust not to report on them. **Source**: radiookapi.net. The original photo was presumably taken in Lubumbashi, but represents the same transaction.

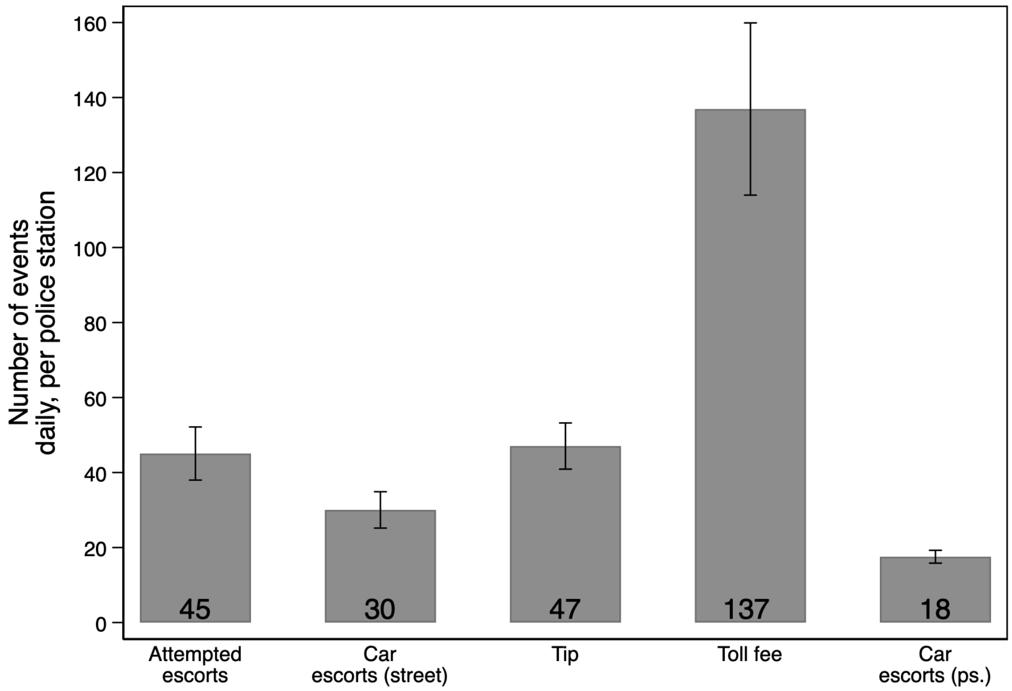
Figure A4: The Formal Process for Escorting Drivers to the Police Station.

Notes: Due to the incentives provided by the quota scheme, agents were perceived to target high yield drivers (typically richer but with no protector, and often taxi drivers) rather than drivers who have committed a violation
Source for images on top: Amen Ministry TV, Bitaka tracasserie ya ba roulage na kin ekomi koleka makasi. **Source for image on bottom**: Youtube Congo Avenir.

Figure A5: Typical Police Stations in Kinshasa

Notes: This figure shows four police stations of the traffic police battalion in the city of Kinshasa. **Source**: research team.

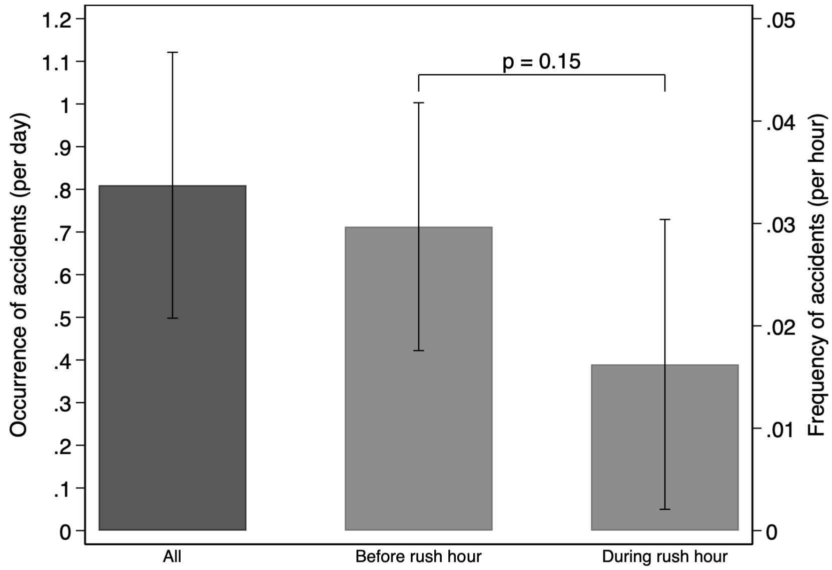
Figure A6: Agents' Daily Behavior, Aggregated Across All Street Agents Attached to a Given Police Station, Averaged Across Police Stations



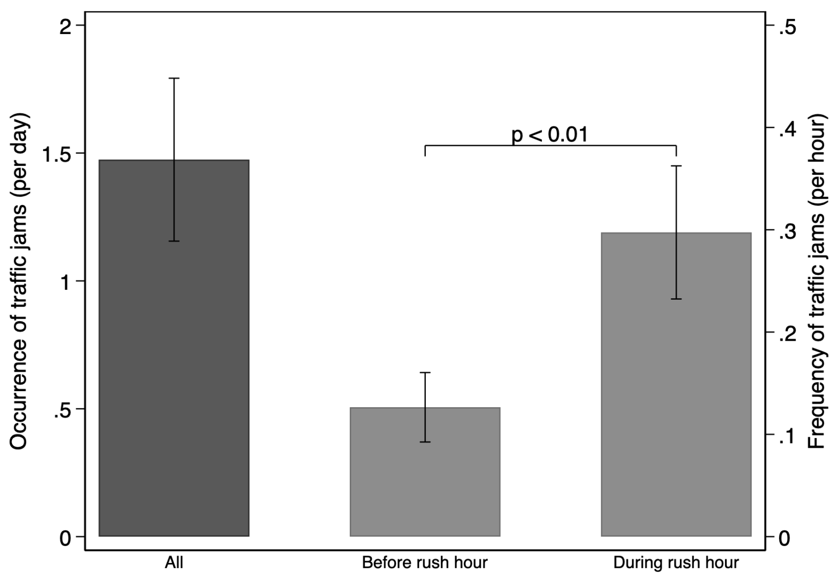
Notes: This figure presents the police-station aggregates of the daily number of agent-driver interactions of the agents in the street that are attached to a particular police station, with tracasserie (Attempted escorts), with tracasserie that results in an escort (Car escorts), as well as agent-driver interactions with a tip request (Tip) and with a toll fee request (Toll fee). "street" denotes that the data source is the street observers' records of events. "ps." denotes that the data source is the police station observers (JPO and FCA). Error bars indicate 95% confidence intervals. The observational sample covers 352 teams of agents/intersections-days. This figure uses the data from the subset of 157 observations in that set that had no experimental manipulation. **Source**: street observers' records of events and police station observers (JPO and FCA), assembled following the description provided Supplemental Study Documentation, Section 1.

Figure A7: Accidents and Traffic Jams, Before and After the Rush Hour

Panel A. Accidents Happen Throughout the Day



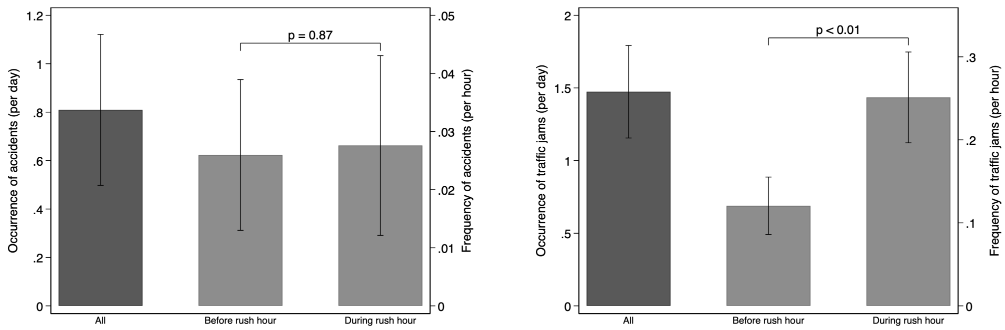
Panel B. Traffic Jams are Concentrated during Rush Hour



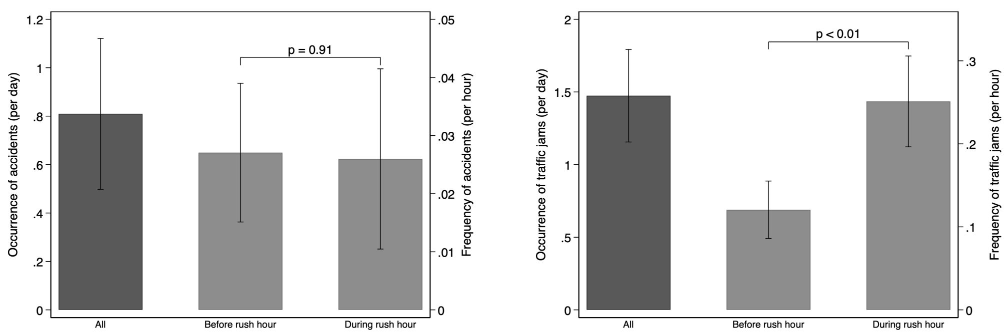
Notes: The first bar presents the mean number of hours in which an accident was recorded in the day (Panel A) and the mean number of hours in which a traffic jam was recorded in the day (Panel B). The second and third bars present the frequency of reported accidents *per hour* (Panel A) and the frequency of reported traffic jams *per hour* (Panel B), for the sample before the rush hour and during the rush hour, respectively. Accidents and traffic jams were measured and constructed as follows. The observers completed a questionnaire every hour, answering the following questions concerning the intersection over the previous hour: a. whether there were traffic jams or not; b. whether there was an accident or not. Using the street observers reports of whether an accident, and whether a traffic jam occurred in a given intersection-hour. We construct indicators taking value 1 if at least one of the observers posted to a given intersection (there are two observers at each intersection through the working hours of the day) reported there to be one in the corresponding intersection-hour. We then sum these intersection-hour indicators at the intersection - day level (the first bar) and the intersection - day - rush hour level (the second and third bar). The rush hour cutoff is defined as 3pm. The results are robust to different rush hour cutoffs (1pm, 2pm and 4pm), as shown in Figure A8. Error bars indicate the 95% confidence interval. p is the *p*-value obtained from a two-sample *t*-test of the equality of means. The observational sample covers 352 teams of agents/intersections-days. This figure uses the data from the subset of 157 observations in that set that had no experimental manipulation. **Source**: street observers' records of events.

Figure A8: Accidents and Traffic Jams, Different Rush Hour Cutoffs

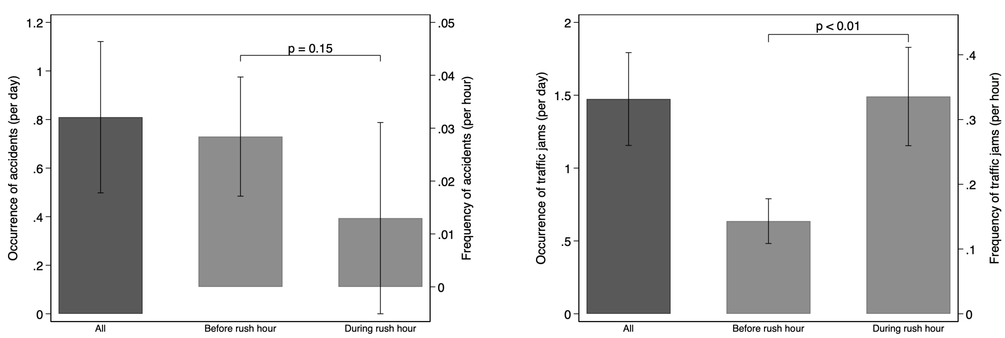
Panel A. Rush hour cutoff: 1pm



Panel B. Rush hour cutoff: 2pm



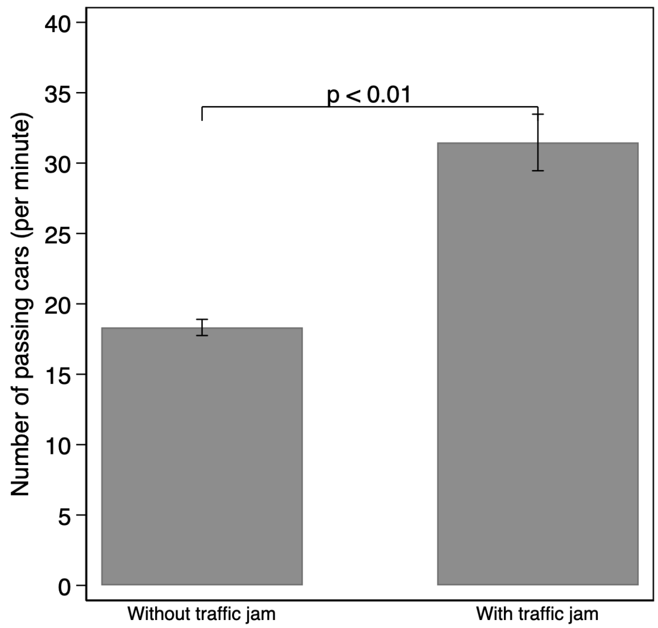
Panel C. Rush hour cutoff: 4pm



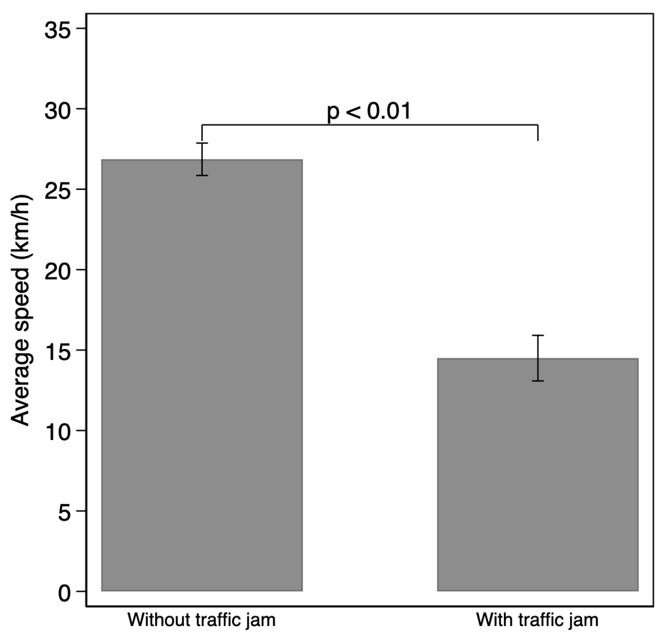
Notes: This figure replicates Figure A7 using different rush hour cutoffs. The first bar presents the mean number of hours in which an accident was recorded in the day (Panel A) and the mean number of hours in which a traffic jam was recorded in the day (Panel B). The second and third bars present the frequency of reported accidents per hour (Panel A) and the frequency of reported traffic jams per hour (Panel B), for the sample before the rush hour and during the rush hour, respectively. Accidents and traffic jams were measured and constructed as follows. The observers completed a questionnaire every hour, answering the following questions concerning the intersection over the previous hour: a. whether there were traffic jams or not; b. whether there was an accident or not. Using the street observers reports of whether an accident, and whether a traffic jam occurred in a given intersection-hour. We construct indicators taking value 1 if at least one of the observers posted to a given intersection (there are two observers at each intersection through the working hours of the day) reported there to be one in the corresponding intersection-hour. We then sum these intersection-hour indicators at the intersection - day level (the first bar) and the intersection - day - rush hour level (the second and third bar). The rush hour cutoffs are defined as 1pm, 2pm and 4pm. Error bars indicate the 95% confidence interval. p is the *p*-value obtained from a two-sample *t*-test of the equality of means. The observational sample covers 352 teams of agents/intersections-days. This figure uses the data from the subset of 157 observations in that set that had no experimental manipulation. **Source**: street observers' records of events.

Figure A9: Correlates of a Traffic Jam

Panel A. Number of Vehicles Present at the Intersection per Minute

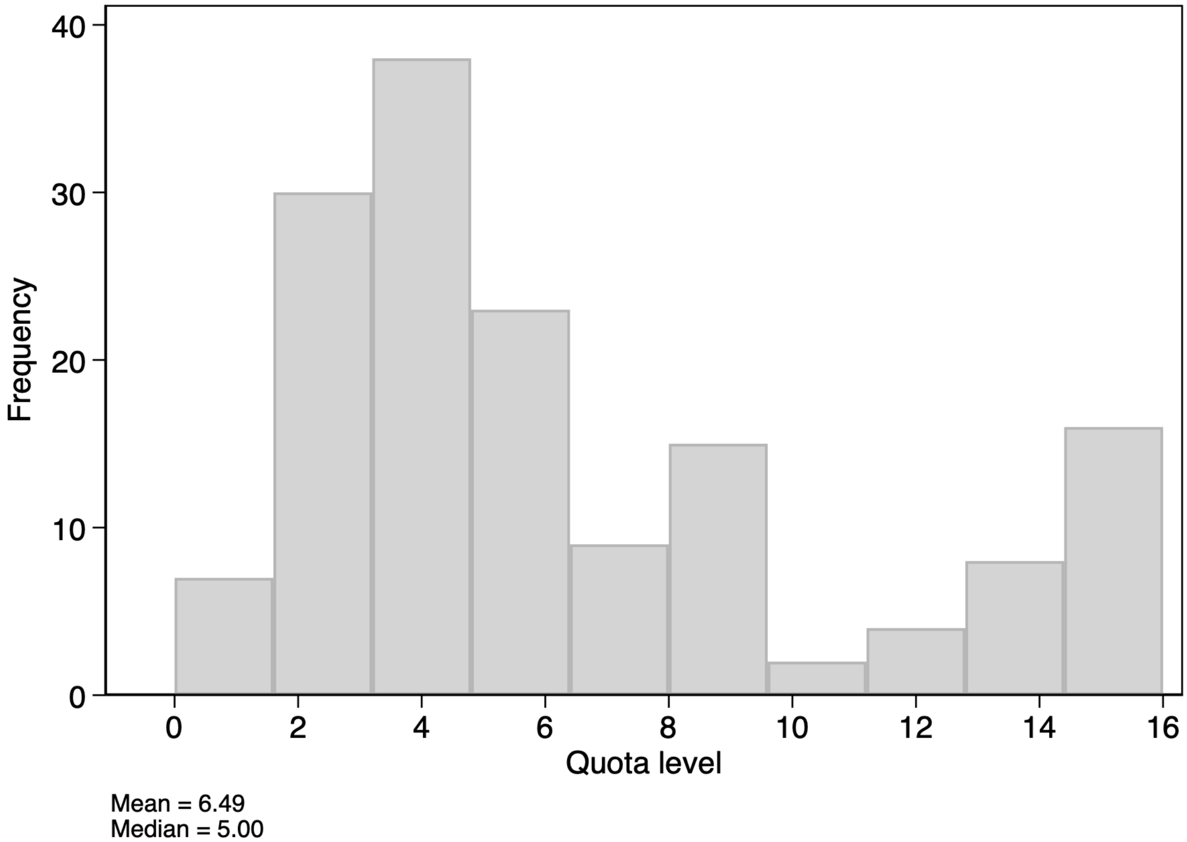


Panel B. Average Speed of Vehicles Driving Through the Intersection



Notes. In both panels, the mean of the corresponding variable is reported for hour blocks in which there was no traffic jam recorded (left bar) and hour blocks in which there was (right bar). In Panel A, the variable analyzed is the number of vehicles that are present at the intersection in last minute of each hour at each intersection. To gather this information, observers at each intersection were instructed to count the number of vehicles at the intersection (or passing through) for the last minute of each hour. In Panel B, the variable analyzed is the average speed of a vehicle in the last minute of each hour. To gather this information, the observers at each intersection were instructed to provide an estimate for the average speed of the vehicles passing by in the last minute of each hour. Error bars indicate the 95% confidence interval. p is the *p*-value obtained from a two-sample *t*-test of equality of means. The observational sample covers 352 teams of agents/intersections-days. This figure uses the data from the subset of 157 observations in that set that had no experimental manipulation. **Source**: street observers' records of events.

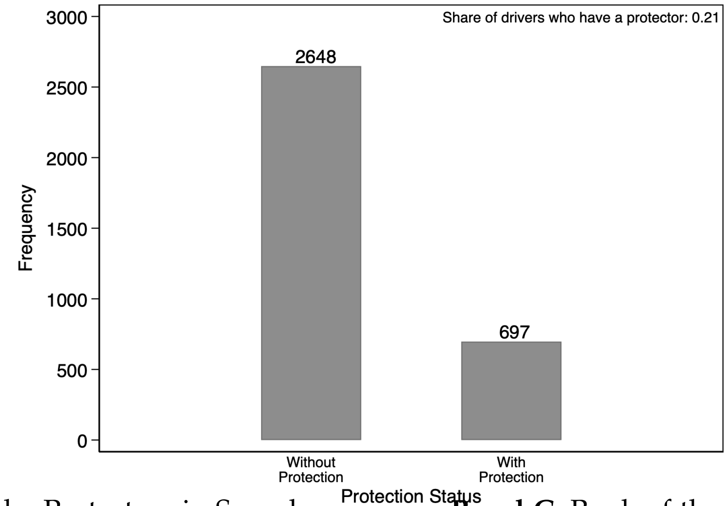
Figure A10: Distribution of the Level of the Quota



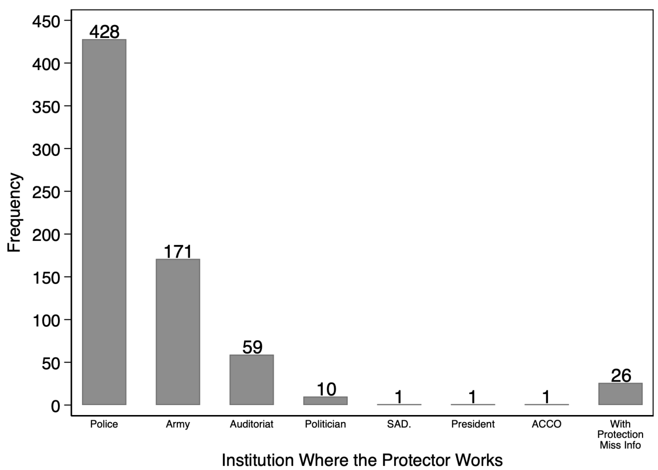
Notes: This figure presents the distribution of the actual quota level in the observational sample. The observational sample for which we have data on the level of the quota covers 327 teams of agents/intersections-days, of which 155 were observed at their level without experimental manipulation. This figure uses the data from these 157 observations. **Sources**: police station data (JPO and FCA sources), research coordinator general tracking sheet (which we called "tracking grade d'elite"), JPO research supervisor process tracking sheet, the street-level assistants' process tracking sheet (which we called "tracking assistants"), auditor's process tracking sheet, and daily records of the three daily supervision meetings. See Supplemental Study Documentation, Section 2 for a description of these sources and their aggregation.

Figure A11: Negotiating the Police Station Bribe—Protectors

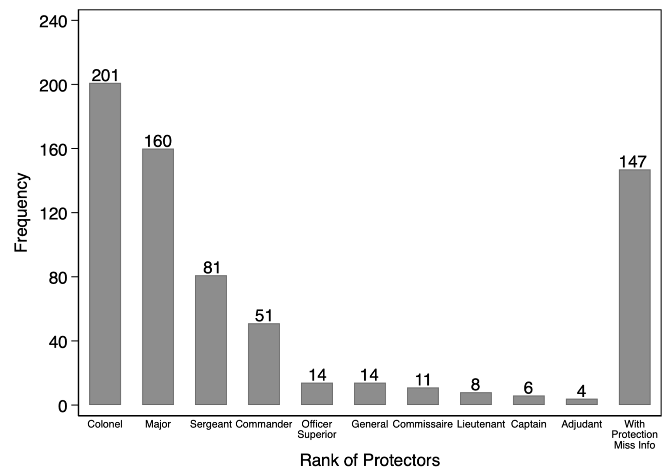
Panel A. Share of Drivers Escorted to the Police Station Who Have a Protector



Panel B. Institution of the Protectors in Sample



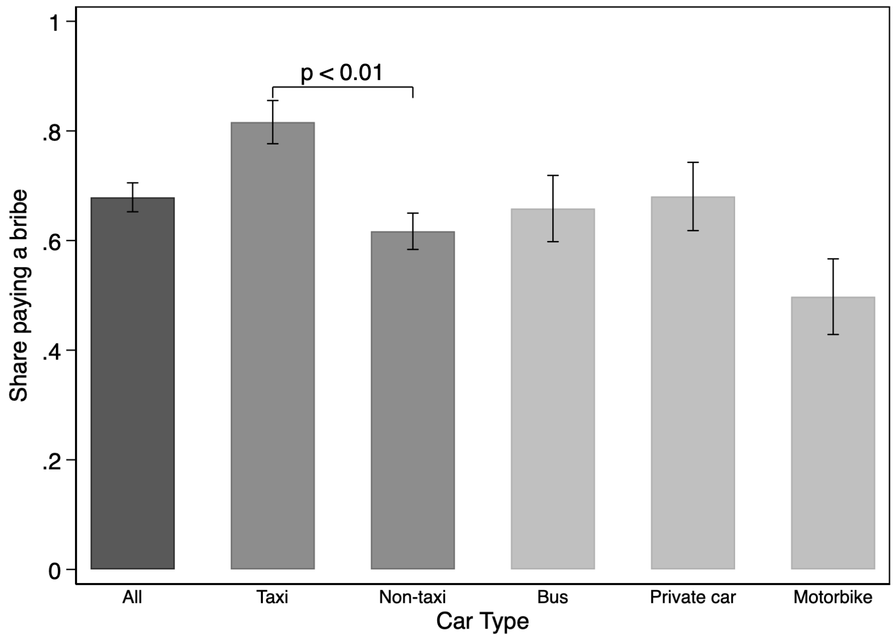
Panel C. Rank of the Protectors in Sample



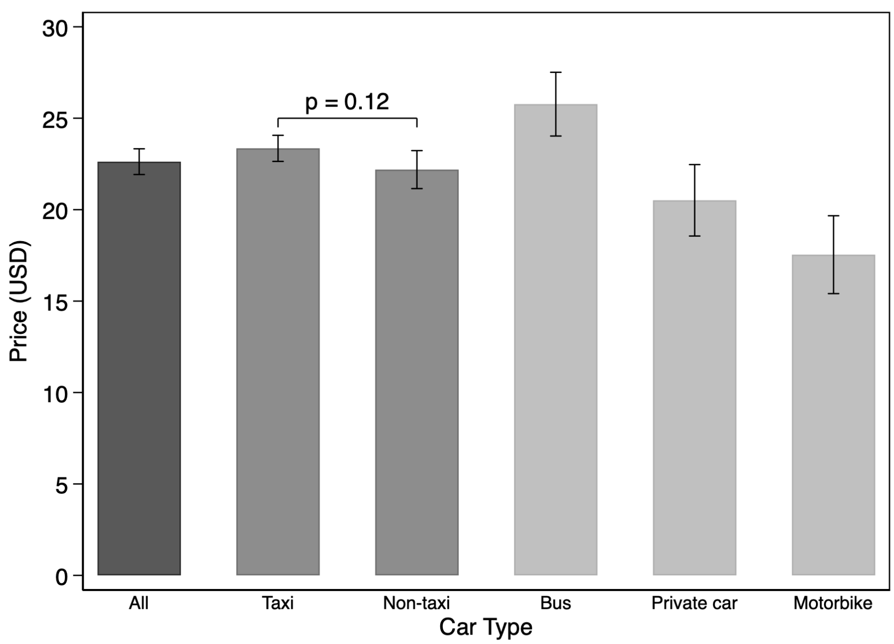
Notes: This figure presents the frequency of drivers escorted to the police stations who have a protector (Panel A), the frequency of drivers who have a protector from a given state institution (Panel B) and the military rank of the protectors (Panel C). The state institutions are the police, the army, the "Auditoriat Militaire" (office of the prosecution for military affairs), a politician, state administrators (State ADministrators, such as administrator of marché liberté, neighborhood chiefs, agents of the territory administrative division) , the president of the country, the national association of drivers (*ACCO – Association des Chaufeurs du Congo* in French), or have a protector for which the information is missing. In the DRC, the organization of the police also followed military ranks just prior to our study and those ranks were routinely used in French, hence Panel C's ranks include both military and police protectors. The titles were ranked as followed, where we first list the official rank, and then the one it is routinely referred to as, based on the titling before the study's period (only some ranks are relevant in the figure because some ranks are not represented among the protectors): 1. Commissaire divisionnaire adjoint - commissaire provincial de la police, 2. Commissaire supérieur principal - colonel; 3. Commissaire supérieur - lieutenant-colonel; 4. Commissaire supérieur adjoint - major; 5. Commissaire principal - capitaine; 6. Commissaire - Lieutenant; 7. Commissaire-adjoint - sous lieutenant; 8. Sous-commissaire principal - adjudant en chef; 9. Sous-commissaire - adjudant de première classe; 10. Sous-commissaire adjoint - adjudant de 2eme classe; 11. Brigadier en chef - 1er sergent major; 12. Brigadier 1ere classe - premier sergent; 13. Brigadier - sergent; 14. Agent de police principal - caporal; 15. Agent de police - soldat de première classe; 16. Agent de police première classe - soldat; 17. Élève policier - recrue. The observational sample covers 352 teams of agents/intersections-days. This figure uses the full observational sample. **Source:** police station observers (JPO and FCA).

Figure A12: Bribe Yield by Type of Driver

Panel A. Taxi Drivers are the Most Likely to Pay a Bribe

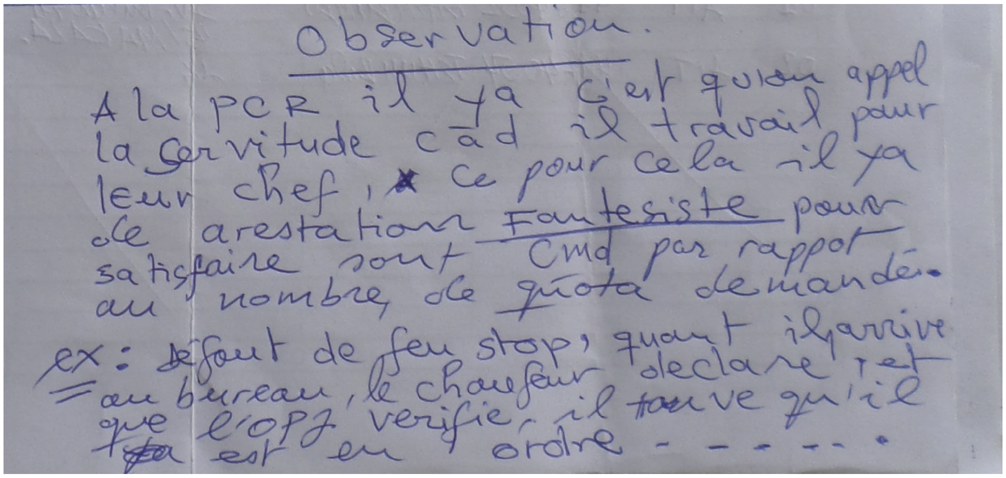


Panel B. Taxi Drivers are Profitable



Notes: Panels A and B respectively show the share paying a bribe and the mean price (the bribe revenue per driver escorted, in USD, for each driver escorted to the police station who makes a payment) for all car types (bar 1), broken by taxi (bar 2) and non-taxi (bar 3). Non-taxi is decomposed by bus (bar 4), private car (bar 5) and motorbike (bar 6). Error bars indicate 95% confidence intervals. p is the *p*-value obtained from a two-sample (taxi vs non-taxi) *t*-test of equality of means. The observational sample covers 352 teams of agents/intersections-days. This figure uses the data from the subset of 157 observations in that set that had no experimental manipulation. **Source**: police station observers (JPO and FCA) and police stations' formal accounting of informal payments.

Figure A13: Forging *"Fantasy Arrests"*


Observation.

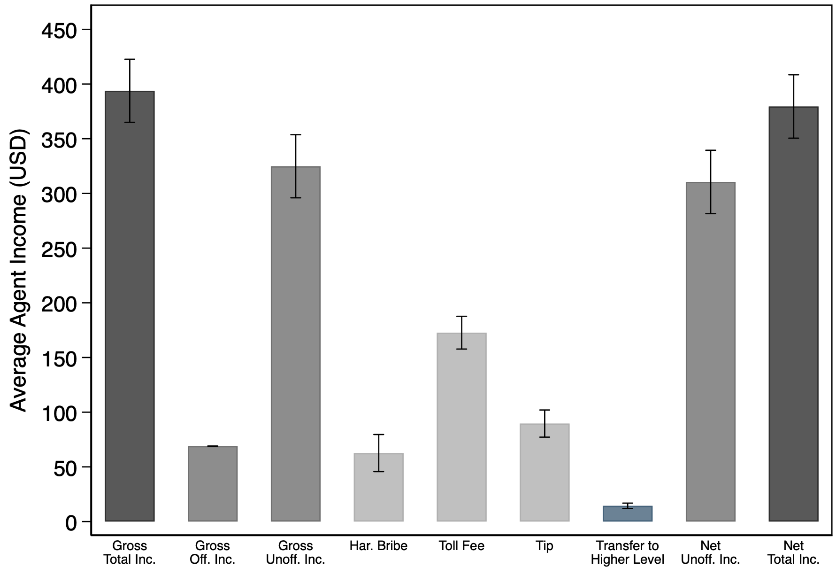
A la PCR il ya c'est quon appel la servitude c à d il travail pour leur chef, ce pour cela il ya de arestation Fantesiste pour satisfaire sont Cmd par rappot au nombre de quota demandé.

ex: défaut de feu stop, quant il arrive au bureau, le chaufeur declare et que l'OPJ verifie, il trouve qu'il est en ordre - - - - - .

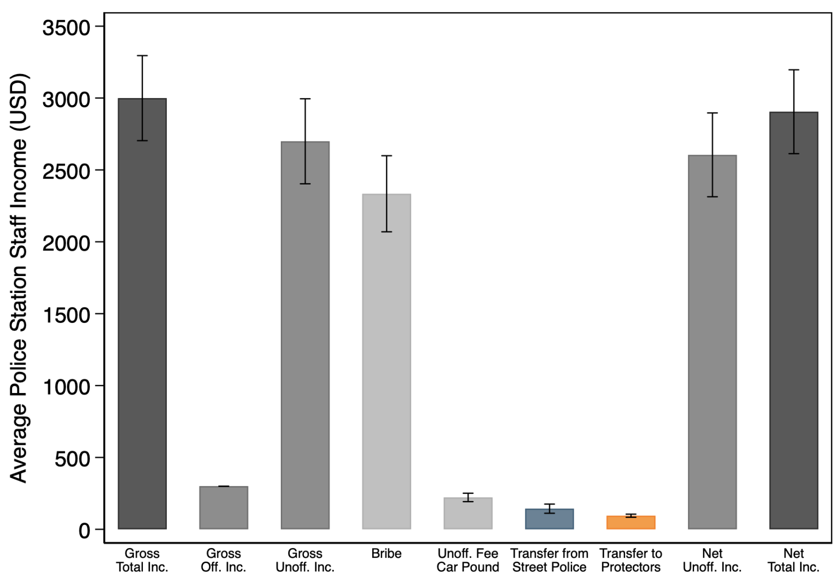
Notes: Excerpt from the back of a Fine Collection Agency's agent (FCA) report. FCAs recorded the details of the universe of transactions inside police stations on a blank sheet of paper every day. In addition, they were encouraged to report as much information as possible regarding the system, and their interpretations on the back of their sheets each day. Translation from authors: *"At the traffic police agency, there is what we call 'serfdom', which means that they work for their boss, this is why there are fantasy arrests to satisfy their commander vis a vis the number of quota that he requests. For example: defective brake light, yet when he [the driver] comes to the station, the driver declares, and the JPO verifies, only to find that it is actually working......"*

Figure A14: Official and Unofficial Income From the System

Panel A. Monthly Income of an Agent in the Street

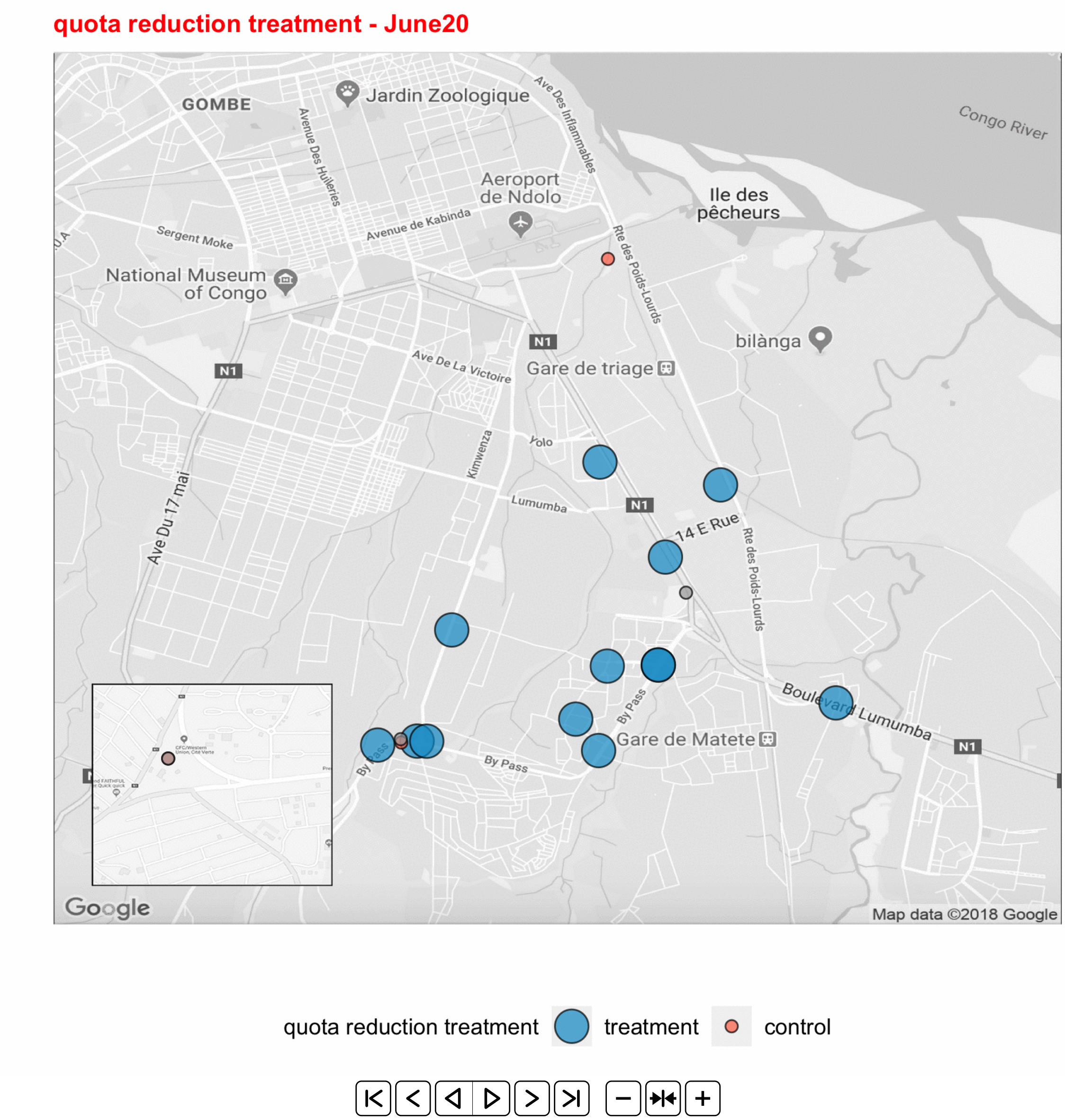


Panel B. Monthly Income of a Manager (Police Station Commander)



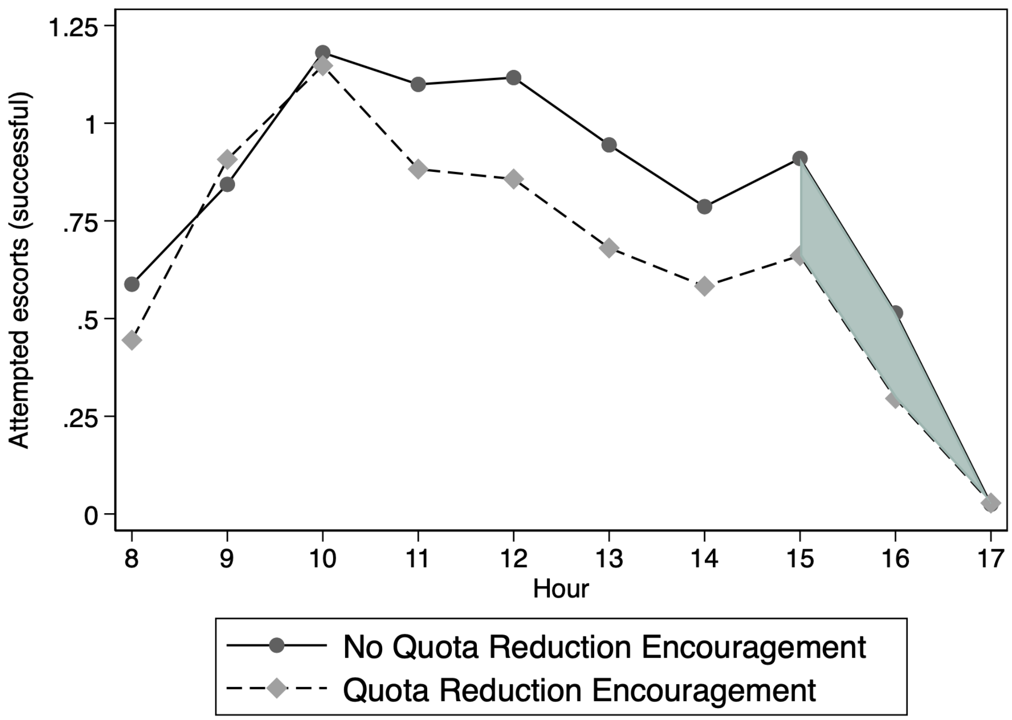
Notes: This figure presents the unofficial revenue generated by the corruption system. In both panels, the means reported in the bars are broken down as follows: bar 1 = bar 2 + bar 3, bar 3 = bar 4 + bar 5 + bar 6, bar 8 = bar 3 - bar 7, bar 9 = bar 1 - bar 7. The gray scale in the bars indicates the breakdown of the different forms of revenue: darker bars are the aggregate, lighter bars are the breakdown of the bars one level darker. In both panels, blue color indicates the monetary payments from state officials to their respective superior: in Panel A, it is reported as a cost in the agent's accounting, in Panel B, it reported as a revenue from the perspective of the supervisor. Orange color indicates the transfer from a supervisor to their superiors in the agency. In Panel B, the transfer from the street police and the transfer to protectors are considered as the total transfers of a whole team, thus are not divided by the number of commanders in the police station. Error bars indicate 95% confidence intervals. The observational sample covers 352 teams of agents/intersections-days. This figure uses the data from the subset of 157 observations in that set that had no experimental manipulation. **Source**: street observers' records of events (Panel A); police station observers (JPO and FCA) (Panel B); and street assistants for "Transfer from street police" in Panel B. We assembled the sources following the description provided in Supplemental Study Documentation, Section 1.

Figure A15: Assignment of the Quota Reduction Encouragement



Notes: This figure shows the assignment of the quota reduction *encouragement* to the corresponding intersections of the treated teams of agents across days. The experimental sample covers 337 teams of agents/intersections-days, which are also the unit of assignment. **Source:** randomization calendar.

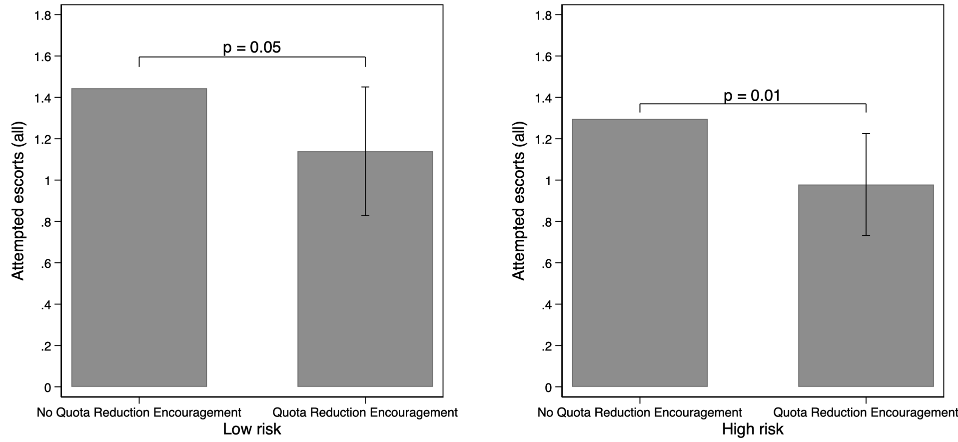
Figure A16: The Quota Reduction Encouragement and the Rush Hour



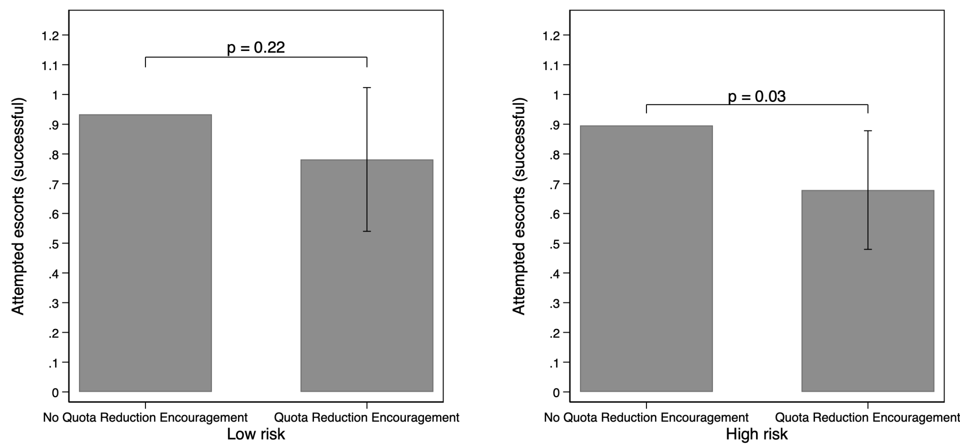
Notes: This figure presents the team hourly mean number of successful escorts, separately for the sample not assigned to the quota reduction *encouragement* and for the sample assigned to the quota reduction *encouragement*. The shaded area denotes the hour blocks that are the rush hours. The experimental sample covers 337 teams of agents/intersections-days, which are also the unit of assignment. Observations for which the dependent variable are missing are dropped. There is no selection of data missing on treatment assignment. **Source:** street observers' records of events.

Figure A17: Effect of Quota Reduction Encouragement on Agent Behavior by Rush Hour

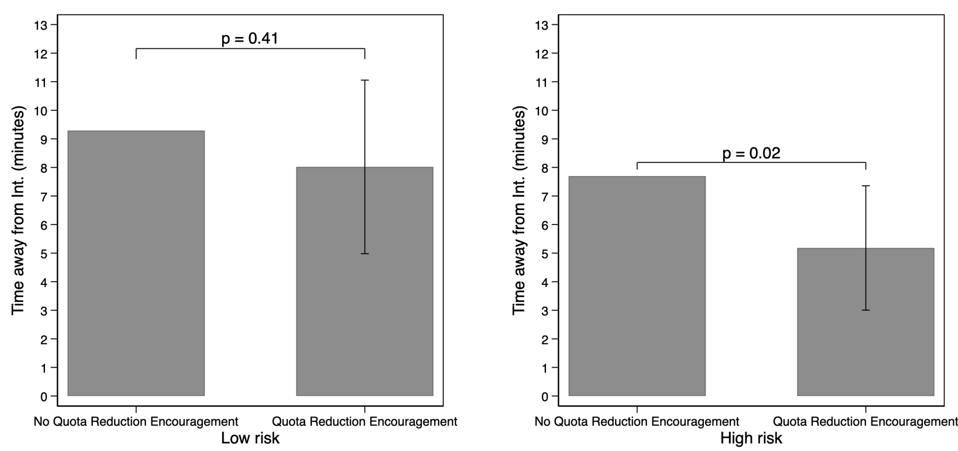
Panel A. Attempted Escorts Increase at all Hours



Panel B. Successful Escorts Increase Especially during Rush Hour



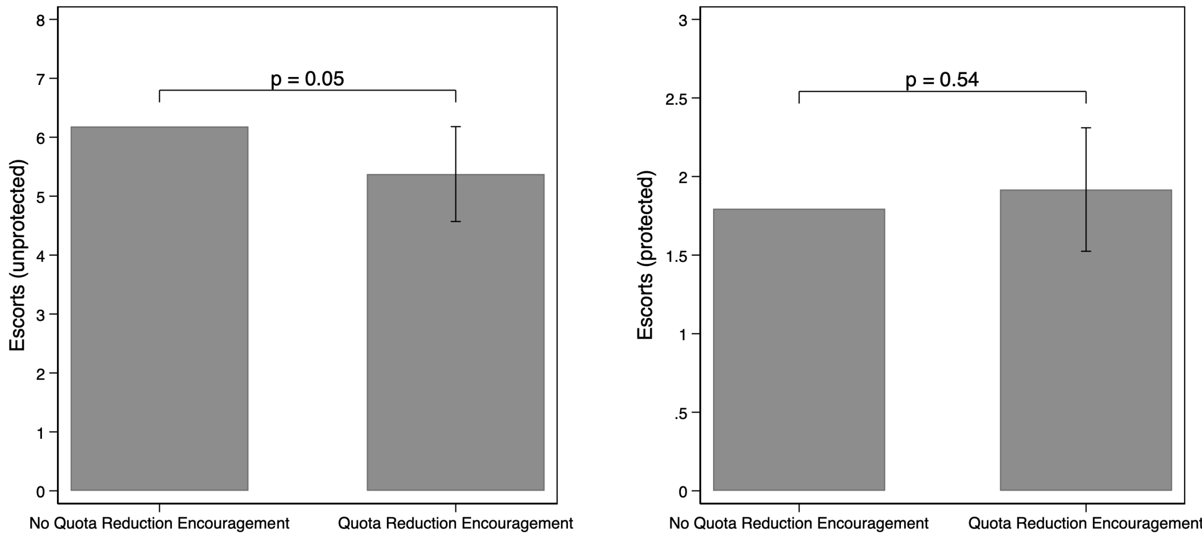
Panel C. Time Away Escorting Increases during Rush Hour



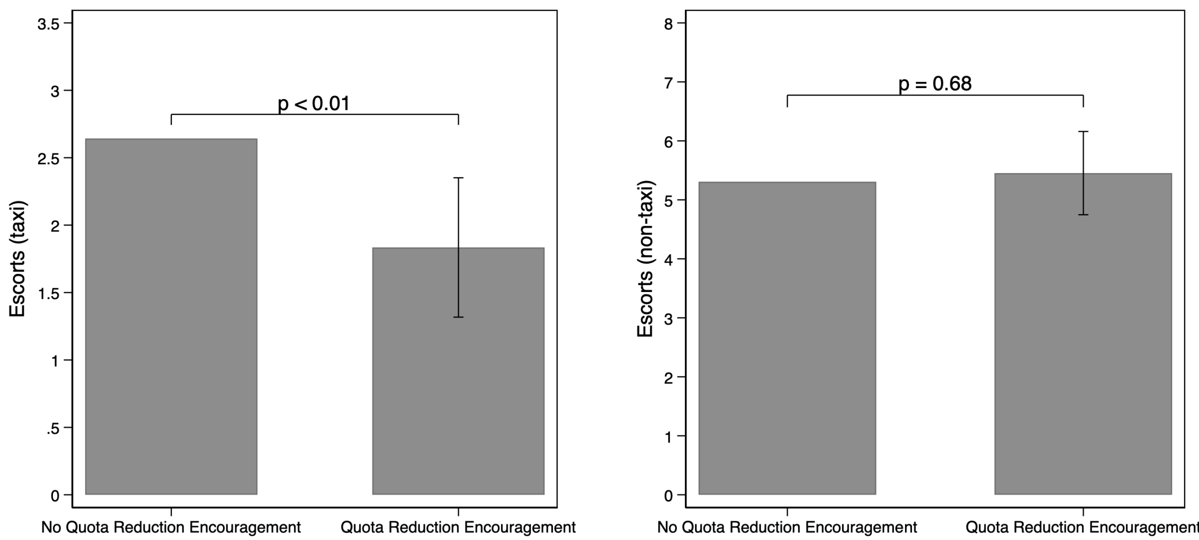
Notes: This figure presents the mean of the daily number of all attempted escorts per intersection (Panel A), the mean of the daily number of successful attempted escorts per intersection (Panel B), and the mean of the daily total minutes away from intersections due to escorting per agent (Panel C), respectively for "High risk" and "Low risk." To classify intersection-hours as high vs. low risk, we estimate the share of traffic jams for each intersection-hour and define intersection-hour blocks above the 50 percent quantile as "High risk", and below the 50 percent quantile as "Low risk"), separately for the sample not assigned to the quota reduction *encouragement* and for the sample assigned to the quota reduction *encouragement*. "Attempted escort" is an interaction between a driver and an agent in which the agent escorts the driver to the police station (successful), or in which the agent is seen harassing the driver trying to get hold of the vehicle, but in which they fail to escort the driver (failed). "Time away from Int." is the gap between the timestamp at which the agent is seen interacting with a driver for an escort to the police station and the timestamp of the agent's next interaction at the intersection. The figure shows the re-scaled confidence interval *on the reduced form coefficient*, as well as the *p*-value for the difference between the two groups. Error bars indicate 95% confidence intervals. p is the *p*-value of the reduced form estimates in Equation 1, including randomization block (team of agents/intersection) fixed effects and day fixed effects. The experimental sample covers 337 teams of agents/intersections-days, which are also the unit of assignment. Observations for which the dependent variable are missing are dropped. There is no selection of data missing on treatment assignment. **Source**: street observers' records of events.

Figure A18: Are High-Bribe Drivers Targeted to Fulfill the Quota?

Panel A. Unprotected vs. Protected Drivers

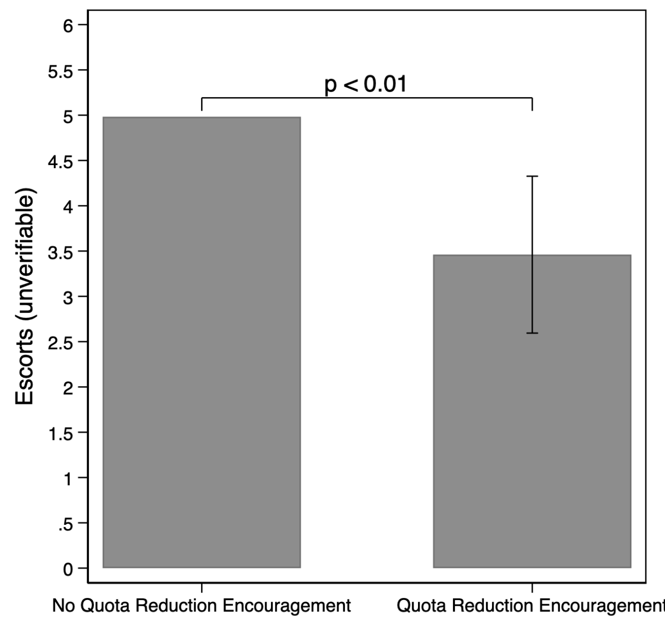


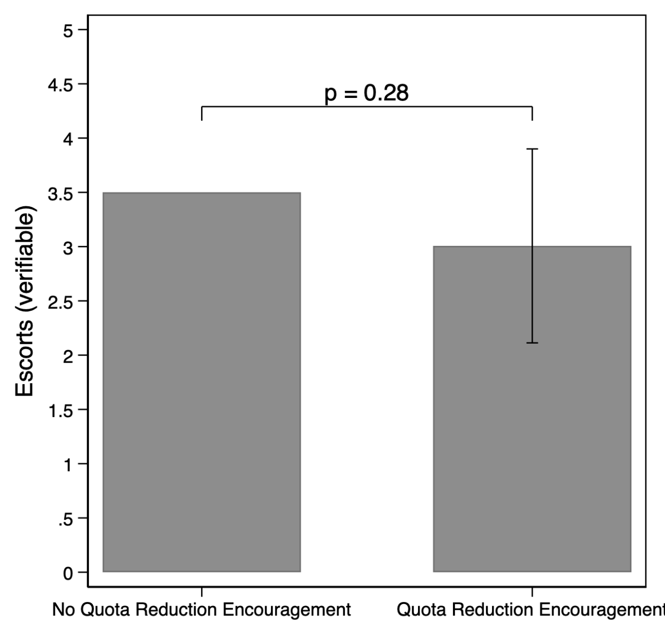
Panel B. Taxi vs. Non-taxi Drivers



Notes: This figure presents the mean daily number of unprotected and protected drivers escorted to the police station per intersection (Panel A), and the mean daily number of taxi and non-taxi drivers escorted to the police station per intersection (Panel B), separately for the sample not assigned to the quota reduction *encouragement* and for the sample assigned to the quota reduction *encouragement*. The figure shows the re-scaled confidence intervals *on the reduced form coefficients*, as well as the *p*-value for the differences between the two groups. Error bars indicate 95% confidence intervals. p is the *p*-value of the reduced form estimates in Equation 1, including randomization block (team of agents/intersection) fixed effects and day fixed effects. The experimental sample covers 337 teams of agents/intersections-day observations, which are also the units of assignment. To examine official and unofficial police station data, we further restrict to the intersection-days for which the JPO and FCA records existed both in the scans of the original source and in the originally data entered in surveycto from the original source, resulting in the loss of 30 observations. In addition, observations of this sample for which the dependent variable are missing are dropped. See Supplemental Study Documentation, Section 1 for a detailed description. There is no selection of data missing on treatment assignment. **Source**: police station observers (JPO and FCA) and police station formal accounting of unofficial payments.

Figure A19: Does the Quota Induce Allegations that are Unverifiable?

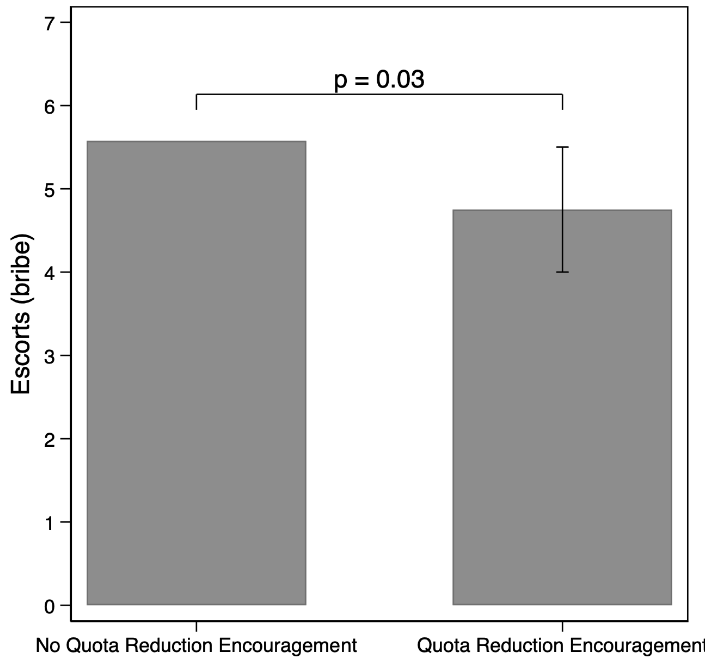




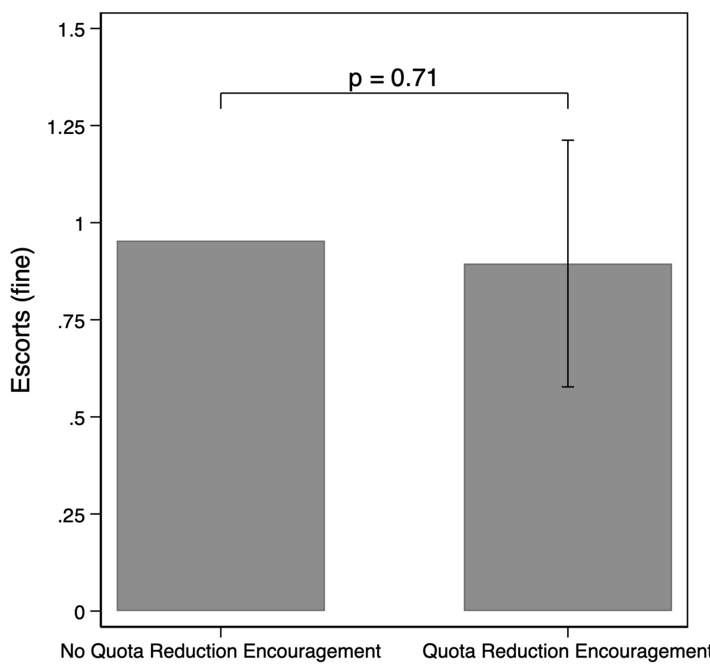
Notes: This figure presents the mean daily number of drivers escorted to the police station accused of unverifiable and verifiable infractions per intersection, separately for the sample not assigned to the quota reduction *encouragement* and for the sample assigned to the quota reduction *encouragement*. A verifiable infraction is an accusation that could potentially be verified by a third party, such as having no driving licence; an unverfiable infraction is an accusation that relies on the arbitrary report of the police agent and cannot be verified even if a third-party was invoked, such as having conducted a dangerous maneuver, and is sometimes based on forged evidence. The figure shows the re-scaled confidence interval *on the reduced form coefficient*, as well as the p-value for the difference between the two groups. Error bars indicate 95% confidence intervals. p is the p-value of the reduced form estimates in Equation 1, including the randomization block (team of agents/intersection) fixed effects and day fixed effects. The experimental sample covers 337 teams of agents/intersections-day observations, which are also the units of assignment. To examine official and unofficial police station data, we further restrict to the intersection-days for which the JPO and FCA records existed both in the scans of the original source and in the originally data entered in surveycto from the original source, resulting in the loss of 30 observations. In addition, observations of this sample for which the dependent variable are missing are dropped. See Supplemental Study Documentation, Section 1 for a detailed description. There is no selection of data missing on treatment assignment. **Source**: police station observers (JPO and FCA) and police station formal accounting of unofficial payments.

Figure A20: The Quota Generates Corruption Revenues, not Fines

Panel A. Number of Drivers that Pay Bribes at the Police Station



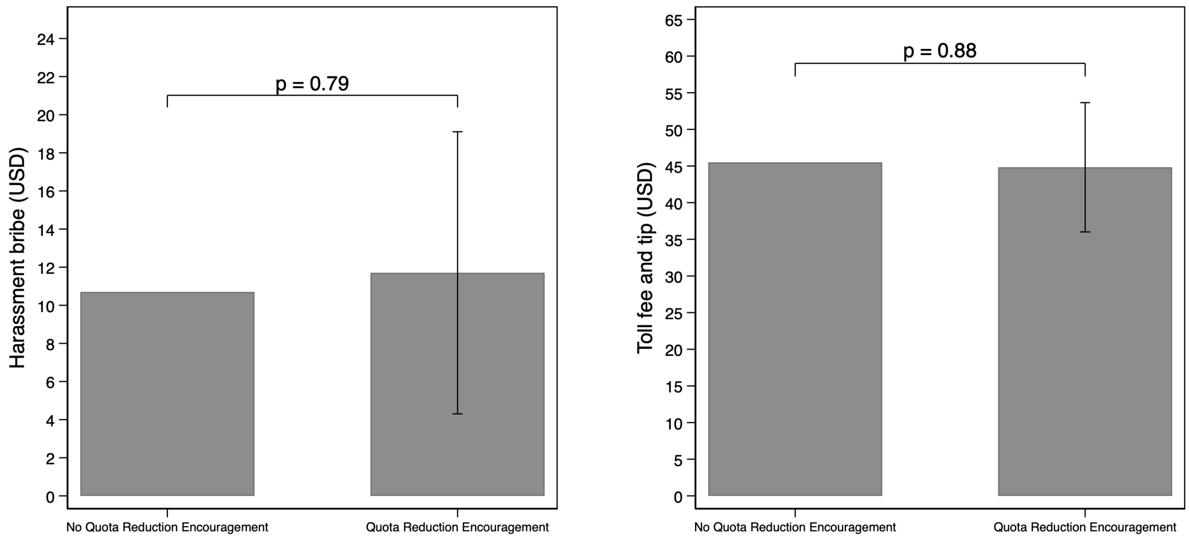
Panel B. Number of Drivers that Pay Fines at the Police Station



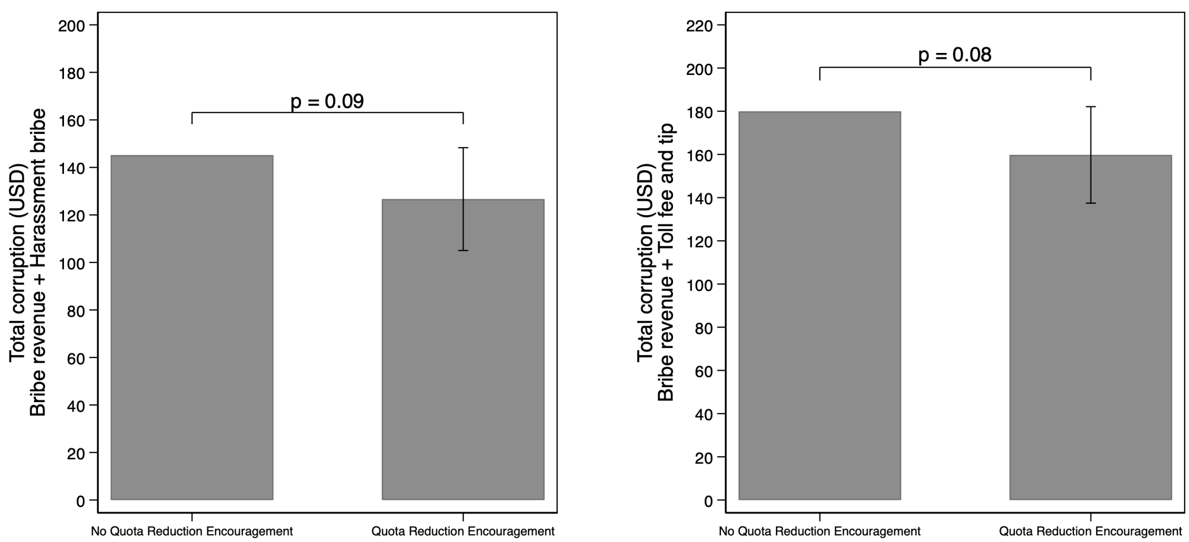
Notes: This figure presents the mean daily number of drivers escorted who pay a bribe (Panel A) and who pay a fine (Panel B) per intersection, separately for the sample not assigned to the quota reduction *encouragement* and for the rest. The figure shows the re-scaled confidence interval *on the reduced form coefficient*, as well as the p-value for the difference between the two groups. Error bars indicate 95% confidence intervals. p is the p-value of the reduced form estimates in Equation 1, including the randomization block (team of agents/intersection) fixed effects and day fixed effects. The experimental sample covers 337 teams of agents/intersections-day observations, which are also the units of assignment. To examine official and unofficial police station data, we further restrict to the intersection-days for which the JPO and FCA records existed both in the scans of the original source and in the originally data entered in surveycto from the original source, resulting in the loss of 30 observations. In addition, observations of this sample for which the dependent variable are missing are dropped. See Supplemental Study Documentation, Section 1 for a detailed description. There is no selection of data missing on treatment assignment. **Source**: police station observers (JPO and FCA) and police station formal accounting of unofficial payments.

Figure A21: The Quota Maximizes the Corruption Surplus

Panel A. Corruption Revenue from Bribes Paid to Agents in the Street



Panel B. Total Corruption Revenue: from Bribes Paid to Agents in the Street, and to Managers in Police Stations



Notes: This figure presents the mean daily police revenue generated in the street, i.e. tracasserie bribes, toll fees and tips per intersection (Panel A), and the mean daily total corruption revenue described in Table 5 (Panel B) per intersection, separately for the sample not assigned to the quota reduction *encouragement* and for the sample assigned to the quota reduction *encouragement*. The figure shows the re-scaled confidence intervals *on the reduced form coefficients*, as well as the p-value for the differences between the two groups. Error bars indicate 95% confidence intervals. p is the p-value of the reduced form estimates in Equation 1, including randomization block (team of agents/intersection) fixed effects and day fixed effects. The experimental sample covers 337 teams of agents/intersections-day observations, which are also the units of assignment. To examine official and unofficial police station data, we further restrict to the intersection-days for which the JPO and FCA records existed both in the scans of the original source and in the originally data entered in surveycto from the original source, resulting in the loss of 30 observations. In addition, observations of this sample for which the dependent variable are missing are dropped. See Supplemental Study Documentation, Section 1 for a detailed description. There is no selection of data missing on treatment assignment. **Source**: street observers' records (Panel A); police station observers (JPO and FCA) (Bribe revenue in Panel B).

Appendix B. Appendix Tables

Table A1: Summary Statistics of Study Participants

	Mean outcomes	
	Agents	Police station police staff
	(1)	(2)
Panel A: Characteristics of officers		
Age	41.68	44.77
	(4.94)	(8.23)
Is female	0.16	0.30
	(0.37)	(0.46)
Highest education level is primary education	0.38	0.50
	(0.50)	(0.51)
Highest education level is secondary education	0.62	0.44
	(0.50)	(0.51)
Is married	0.94	0.78
	(0.25)	(0.42)
Number of children	5.00	5.74
	(1.82)	(2.51)
Speaks the language of the capital	1.00	1.00
	(0.00)	(0.00)
Speaks the regional language of the South	0.32	0.35
	(0.48)	(0.48)
Speaks the regional language of the East	0.45	0.50
	(0.51)	(0.51)
Panel B: Job properties		
Formal recruitment process	0.84	0.80
	(0.37)	(0.41)
Appointed by protector	0.16	0.20
	(0.37)	(0.41)
Number of years working in the traffic police	9.81	7.79
	(5.41)	(5.49)
Formal wage in 2015	69.00	103.46
	(0.00)	(5.63)
Days since last wage paid	93.84	99.88
	(25.04)	(15.08)
Daily unofficial revenue (USD)	17.62	14.94
	(4.52)	(4.68)
Daily savings	2.32	2.90
	(1.63)	(2.65)
Days can survive with current savings	14.68	12.06
	(23.15)	(22.68)
Obs	38	40

Notes: This table presents summary statistics of the police agents in the sample that were interviewed in the exit survey. Panel A shows properties of the police officers themselves, and Panel B of the job they held in 2015. The answers are separated across street staff (column 1) and police station staff (column 2). **Source:** exit surveys after the study was complete (which took place immediately after, and 1 year after the study).

Table A2: Protection and Unofficial and Official Revenue

Panel A. Effect of Having a Protector on Bribe Paid

	Dep. var: Payment		
	(1)	(2)	(3)
Protection	-8.661***		-3.741***
	(1.066)		(1.151)
Post		-41.27***	-39.34***
		(0.692)	(0.795)
Protection × Post			-6.892***
			(1.574)
Randomization block FE	Yes	Yes	Yes
Day FE	Yes	Yes	Yes
Dep. var. mean	40.26	58.26	59.19
Dep. var. s.d.	34.20	35.75	36.64
Observations	5640	5640	5640
R-squared	0.09	0.44	0.45

Panel B. Effect of Having a Protector on Bribe Paid, by Military Rank of Protector

	Dep. var: Payment									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post	-45.16***	-46.66**	-44.96***	-44.73***	-29.33***	-63.07***	-51.64***	-30.85***	-66.90***	-44.95***
	(1.304)	(15.45)	(1.867)	(2.375)	(3.691)	(7.894)	(4.626)	(3.459)	(13.71)	(3.902)
Sample	All protectors with rank	General	Colonel	Major	Captain	Lieutenant	Sergent	Commander	Officier Superior	Commissaire
Classified rank		Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Randomization block FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dep. var. mean	55.05	46.66	53.63	54.35	37.46	72.70	64.85	44.12	72.98	51.28
Dep. var. s.d.	32.04	34.55	27.01	29.85	9.16	25.42	44.66	25.17	56.16	12.62
Observations	1063	11	386	304	22	28	161	102	25	16
R-squared	0.61	0.78	0.70	0.64	0.84	0.84	0.63	0.69	0.77	0.96

Panel C. Effect of Having a Protector on Bribe Paid, by Protector's Affiliation

	Dep. var: Payment				
	(1)	(2)	(3)	(4)	(5)
Post	-46.26***	-47.84***	-43.24***	-41.05***	-61.42***
	(1.219)	(1.530)	(2.445)	(3.456)	(9.794)
Sample	All protectors with affiliation	Police	Army	Auditoriat	Politican
Randomization block FE	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes
Dep. var. mean	55.43	58.10	50.26	50.20	65.73
Dep. var. s.d.	32.90	34.26	30.96	25.46	35.81
Observations	1309	829	341	114	20
R-squared	0.59	0.63	0.56	0.69	0.85

Notes: This table analyzes the effect of having a protector on the initial bribe requested and the actual bribe paid. Panel A estimates a Difference-in-Difference model including *Protection*, *Post*, and their interaction as main regressors, as follows. The observations are each individual driver-JPO interaction at the police station. In the negotiation process, there are two periods: in the first period, the JPO requests a bribe amount; in the second period, the actual bribe is paid, with the possibility that an amount different to the initial request is actually paid. *Post* is an indicator that takes value 1 if the observation is an actual bribe payment, and takes value 0 if the observation is only a bribe payment request. Since both are observed sequentially for each driver, the bribe payment is a "second period" in the negotiation. *Protection* is an indicator taking value 1 if the driver has a protector. Panels B and C focus on those drivers with protection and analyze the negotiation effect, for different military ranks and affiliations of the protectors. We include randomization block fixed effects (Randomization block FE) and day fixed effects (Day FE) in all columns. Dep. var. mean and Dep. var. s.d. report the mean and standard deviation of the dependent variable for the regression sample without the quota reduction *encouragement*. The observational sample covers 620 team of agents/intersection-days for the variables used in this table, as they also include drivers escorted from any intersection outside those that we observe through other sources, and is hence larger than the observational sample of 352 team of agents/intersection-days. Both samples are generated from the same police stations and days. **Source**: police station observers (JPO and FCA).

Table A3: Types of Alleged Infractions

Verifiable Allegations	Observations	Unverifiable Allegations	Observations
no driver's license	170	bad stop	332
no helmet	165	open door	105
no license plate	78	refuse to comply	92
no document	77	illegal stop	88
faulty seatbelt	57	seatbelt unfastened	80
no boarding document	45	traffic obstruction	75
no pink card	45	illegally boarded passengers	55
no seatbelt	43	traffic lane violation	55
faulty driver's license	42	false maneuver	46
faulty windshield	36	illegally parked	35
faulty turn signal	33	wrong way in a roundabout	34
vehicle in poor condition	30	reckless driving	24
faulty helmet	28	overloaded	24
faulty license plate	22	speeding	22
driving without a license	20	refuse to show document	17
faulty boarding document	19	accident	15
physical wound	13	poorly parked	15
faulty document	12	illegal transport	14
no id	9	wrong way on a one way	12
no rear window	7	refuse to fasten seatbelt	10
export of damaged goods	6	driving too close	10
invalid driver's license	4	negotiate	10
faulty rear window	3	driving against traffic	8
no rear stop lights	3	refuse to yield	8
faulty rear brake lights	3	excessive fumes	7
no rear license plate	2	technical failure	6
expired driver's license	2	hit and run	5
faulty insurance	2	refuse to wear a helmet	5
no rear brake lights	2	ignore traffic signs	4
no speed limit sign	2	bad pass	3
Total	997	Total	1255

Notes: This table presents the 30 most frequent types of unverifiable infractions and the 30 most frequent types of verifiable infractions in the police station data. A verifiable infraction is an accusation that could be verified by a third party, such as having no driving licence; a unverfiable infraction is an accusation that relies on the report of the police agent, such as conducting a dangerous maneuver, and is sometimes forged evidence that hinges on the agent's power to issue arbitrary allegations. Since drivers are sometimes brought to the police station under multiple alleged infractions, to construct the sample for this table, we decomposed the drivers' bundles of alleged infractions into individual alleged infractions. Each driver-alleged infraction is one observation. The observational sample covers 620 team of agents/intersection-days for the variables used in this table, as they also include drivers escorted from any intersection outside those that we observe through other sources, and is hence larger than the observational sample of 352 team of agents/intersection-days. Both samples are generated from the same police stations and days. **Source**: police station observers (JPO and FCA).

Table A4: Randomization Implementation Checks

Panel A. Researchers' Compliance: Assignment vs. Administration of the Encouragement

	Dep. var: Quota Reduction Encouraged		
	(1)	(2)	(3)
Assigned to Quota Reduction Encouragement	0.950***	0.957***	0.967***
	(0.0174)	(0.0153)	(0.0162)
Randomization block FE	No	Yes	Yes
Day FE	No	No	Yes
Dep. var. mean	0.51	0.51	0.51
Dep. var. s.d.	0.50	0.50	0.50
Observations	337	337	337
R-squared	0.90	0.93	0.93

Panel B. Commanders' Compliance: Assignment to the Encouragement vs. True Quota Level

	Dep. var:					
	Quota Level			Target Quota Reduction (%)		
	(1)	(2)	(3)	(4)	(5)	(6)
Assigned to Quota Reduction Encouragement	-2.562***	-2.269***	-2.476***	0.557***	0.617***	0.668***
	(0.424)	(0.276)	(0.271)	(0.117)	(0.0978)	(0.100)
Randomization block FE	No	Yes	Yes	No	Yes	Yes
Day FE	No	No	Yes	No	No	Yes
Dep. var. mean	5.12	5.12	5.12	0.31	0.31	0.31
Dep. var. s.d.	4.03	4.03	4.03	1.09	1.09	1.09
Observations	327	327	327	323	323	323
R-squared	0.10	0.65	0.72	0.07	0.40	0.48

Notes: This table presents the analysis of compliance to the quota reduction *encouragement*. In Panel A, the independent variable is an indicator for whether the team-day was assigned to quota reduction and the dependent variable is an indicator for whether the research team actually administered and paid for the quota reduction *encouragement*. In Panel B, the independent variable is an indicator for assignment to assignment to quota reduction *encouragement*. The dependent variables are the measure of the quota level (Columns (1)-(3)) and a ratio measuring the rate of quota reduction target fulfilment, the target quota reduction rate (Columns (4)-(6)). The target quota reduction rate is the natural quota for the corresponding intersection minus the actual quota that day for that intersection, in units of the natural quota for that intersection, multiplied by 2. We multiply the ratio by 2, since the target quota reduction in the treatment *encouragement* group is 50% of the mean quota. That is target quota reduction is $2 \times \frac{\text{natural quota level - observed true quota level}}{\text{natural quota level}}$. A rate of 1 thus indicates that the quota has been reduced to exactly half its natural level. We control for different combinations of the randomization block fixed effect (Randomization block FE) and the day fixed effect (Day FE) in all columns. Dep. var. mean and Dep. var. s.d. report the mean and standard deviation of the dependent variable for the regression sample without the quota reduction *encouragement*. The experimental sample covers 337 teams of agents/intersections-days, which are also the unit of assignment. **Sources for the researchers' administration of the quota reduction *encouragement*:** randomization assignment calendar, the auditor's process tracking sheet, the commanders' process tracking sheet, our complete financial records, our complete list of receipts of payments made by anyone in the research team, the JPO's process tracking sheets, and the project process files. **Sources for the true quota level**: police station data (JPO and FCA sources), research coordinator general tracking sheet (which we called "tracking grade d'elite"), JPO research supervisor process tracking sheet, the street-level assistants' process tracking sheet (which we called "tracking assistants"), the auditor's process tracking sheet, and the daily records of the three daily supervision meetings. See Supplemental Study Documentation, Sections 2 and 4 for a description of these sources and how we assembled them.

Table A5: Randomization Balance

	Mean outcomes			Difference
	Full sample	No Encouragement Assignment	Encouragement Assignment	(3) - (2)
	(1)	(2)	(3)	(4)
Observations	337	157	180	
Monday	0.20	0.20	0.20	0.00
	(0.40)	(0.40)	(0.40)	(0.04)
Tuesday	0.12	0.14	0.11	-0.03
	(0.33)	(0.35)	(0.31)	(0.04)
Wednesday	0.16	0.15	0.17	0.03
	(0.37)	(0.35)	(0.38)	(0.04)
Thursday	0.16	0.13	0.19	0.06
	(0.37)	(0.33)	(0.39)	(0.04)
Friday	0.16	0.18	0.14	-0.05
	(0.37)	(0.39)	(0.35)	(0.04)
Saturday	0.20	0.20	0.19	-0.01
	(0.40)	(0.40)	(0.40)	(0.04)
June	0.34	0.37	0.32	-0.05
	(0.48)	(0.48)	(0.47)	(0.05)
July	0.66	0.63	0.68	0.05
	(0.48)	(0.48)	(0.47)	(0.05)
Day of month	15.10	15.78	14.52	-1.26
	(8.33)	(8.24)	(8.39)	(0.91)
Market day	0.36	0.39	0.33	-0.06
	(0.48)	(0.49)	(0.47)	(0.05)
Encouragement administered	0.51	0.00	0.95	0.95***
	(0.50)	(0.00)	(0.22)	(0.02)
Encouragement administered(t-1)	0.50	0.48	0.51	0.03
	(0.50)	(0.50)	(0.50)	(0.06)

Notes: This table presents a balance test for the assignment to the quota reduction *encouragement*. Random assignment of the quota reduction *encouragement* was done within teams. Columns (1) - (3) present respectively the mean outcomes (with standard deviations in parentheses) for the variables in the full sample, the sample not assigned to quota reduction *encouragement*, and the sample assigned to quota reduction *encouragement*. Column (4) presents the coefficients of an OLS regression (and their standard errors in parentheses) using the corresponding variable as the dependent variable and an indicator quota reduction *encouragement*. The experimental sample covers 337 teams of agents/intersections-days, which are also the unit of assignment. **Source**: randomization calendar.

Table A6: Prediction

Panel A. Logit and OLS

	Dep. var:					
	Probability of paying		#			
	B	F	BH	BL	FH	FL
	(1)	(2)	(3)	(4)	(5)	(6)
Quota level	0.00619*	-0.00151	0.420***	-0.107	0.0924	0.220**
	(0.00367)	(0.00173)	(0.121)	(0.111)	(0.106)	(0.101)
First-stage *F*-statistic	81.70	81.70	81.70	81.70	81.70	81.70
Randomization block FE	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes
Dep. var. mean (no encouragement)	0.65	0.12	4.09	4.04	4.07	4.06
Dep. var. mean (encouragement)	0.62	0.13	2.88	4.52	4.06	3.34
Observations	289	288	289	289	289	289
R-squared	0.55	0.42	0.63	0.44	0.63	0.58

Panel B. Lasso

	Dep. var:					
	Probability of paying		#			
	B	F	BH	BL	FH	FL
	(1)	(2)	(3)	(4)	(5)	(6)
Quota level	0.00535*	0.000466	0.339***	-0.0260	0.0642	0.248**
	(0.00301)	(0.00151)	(0.124)	(0.111)	(0.115)	(0.116)
First-stage *F*-statistic	81.70	81.70	81.70	81.70	81.70	81.70
Randomization block FE	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes
Dep. var. mean (no encouragement)	0.61	0.13	4.07	4.06	4.05	4.07
Dep. var. mean (encouragement)	0.59	0.12	3.16	4.24	4.05	3.35
Observations	289	289	289	289	289	289
R-squared	0.86	0.78	0.68	0.46	0.59	0.70

Notes: In Panel A, we first estimate a model in the sample without the quota reduction encouragement, using an indicator for paying a bribe (Logit), an indicator for paying a fine (Logit), bribe revenue (OLS) and fine revenue (OLS) as dependent variables. We use an indicator for whether the driver's recorded has a reported alleged infraction, an indicator for whether the infraction is verifiable, an indicator for whether the driver is protected, an indicator for different car types (taxi, jeep, minibus, motorbike, private car), an indicator for whether a protector belongs to a significant institution (police, army, auditoriat), an indicator for whether a protector belongs to a major rank (colonel, major, sergeant), the type of observers and hour blocks as the covariates. Then, we 1. predict the probability of paying a bribe (Column (1), B), and the probability of paying a fine (Column (2), F) in the full sample; 2. compute the 50 percent quantiles of predicted bribe and predicted fine in the sample without the quota reduction encouragement, and count the daily number of drivers escorted above the 50 percent quantile of the bribe (Column (3), BH) and the 50 percent quantile of the fine (Column (5), FH), as well as below the 50 percent quantile of the bribe (Column (4), BL) and 50 percent quantile of the fine (Column (6), FL) for each intersection in the full sample. In Panel B, we conduct the same exercise but use instead a Lasso prediction model in the first step. We report the 2SLS coefficient of the quota level for each predicted dependent variable, as well as the effective F-statistic of the first stage following Olea and Pflueger (2013). We include randomization block (team of agents/intersection) fixed effects (Randomization block FE) and the day fixed effects (Day FE) in all columns. Dep. var. mean (no encouragement) and Dep. var. mean (encouragement) report the mean of the dependent variable for the regression sample without and with the quota reduction *encouragement*. The experimental sample covers 337 teams of agents/intersections-day observations, which are also the units of assignment, 327 of which have non-missing quota level. To examine official and unofficial police station data, we further restrict to the intersection-days for which the JPO and FCA records existed both in the scans of the original source and in the originally data entered in surveycto from the original source, resulting in the loss of 30 additional observations. In addition, observations of this sample for which the dependent variable are missing are dropped. See Supplemental Study Documentation, Section 1 for a detailed description. There is no selection of data missing on treatment assignment. **Source:** police station observers (JPO and FCA).