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Improving payment of traffic fines with financial incentives: Discounts versus penalties[1]

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Abstract

The effective enforcement of traffic laws is critical for improved road safety outcomes. Decisions to follow traffic rules and pay fines are influenced by formal institutions (e.g. laws, court summons, and fines) as well as informal institutions (e.g. norms and aspects of culture). Formal and informal institutions create incentives that should be designed to steer individuals' behaviour towards desired outcomes. Unfortunately, there is no reason to believe that the institutions to deal with traffic violations in South Africa currently create effective incentives. This paper discusses the findings of a controlled laboratory experiment that tested the efficacy of different financial incentives which may influence the payment of traffic fines. An early payment discount similar to the incentive under AARTO was compared to a late payment penalty (used in other countries, for example, some states in the USA), and to the absence of any incentives. Furthermore, we examined whether the willingness to settle fines is sensitive to the likelihood of detection by the authorities. We found that introducing financial incentives significantly increases voluntary payment of fines, irrespective of whether immediate payment is encouraged with a discount or late payment is discouraged with a surcharge. In addition, subjects are more sensitive to the likelihood of detection when financial incentives are present.

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Introduction

It is well known that the effective enforcement of traffic laws is critical for improved road safety outcomes (see Wali et al., 2017: 272). Decisions to follow traffic rules and pay fines are influenced by formal institutions (e.g. laws, court summons, and fines) and informal institutions (e.g. norms and aspects of culture). Formal and informal institutions create incentives that should be designed to steer individuals' behaviour towards desired outcomes. Unfortunately, there is no reason to believe that the institutions to deal with traffic violations in South Africa currently create effective incentives. Violations of traffic laws have long been prosecuted via the criminal justice system, but enforcement has been rated as largely ineffective (WHO 2018: 235). While the extant incentive structures (such as penalties and fines) are similar to those of other countries, the majority of transgressors ignore fines without suffering consequences. As a consequence, South Africa ranks in the bottom 25% worldwide for road fatalities per 100 000 of the population, below a significant number of countries with poorer socio-economic indicators.

South Africa apparently exhibits a disjunction between the actual behaviour of road users and that envisaged by lawmakers, caused at least in part by the severely blunted capacity of sanctions to disincentivise violations of traffic laws. The attempts of the traffic authorities to alter behaviour have included measures to strengthen the sanctions by ensuring the payment of fines. This has culminated in the passage of the Administrative Adjudication of Road Traffic Offences Act No 46 of 1998 (AARTO). AARTO introduces, among other things, financial incentives to encourage voluntary payment of traffic fines in the form of a discount of 50% for timely settlement.

This paper presents and discusses the findings of a controlled laboratory experiment that tested the efficacy of different financial incentives which may influence the payment of traffic fines. An early payment discount similar to the incentive included in AARTO was compared to a late payment penalty (used in other countries, for example, some states in the USA), and to the absence of any incentives. Furthermore, we examined whether the willingness to settle fines is sensitive to the likelihood of detection of non-payment by the authorities. We found that introducing financial incentives significantly increases voluntary payment of fines, irrespective of whether immediate payment is encouraged with a discount or late payment is discouraged with a surcharge. In addition, subjects are more sensitive to the likelihood of detection of non-payment when financial incentives are present.

The questionnaire that accompanied the experiment also revealed some of the informal incentives that affect payment (for instance, the subjects strongly believe that nobody else pays fines), and also indicated that the subjects seem to be receptive in principle to formal incentives such as the suspension of licenses.

Incentives in Public Policy

The aim of many public policies is to incentivise specific kinds of behaviour, reflecting a strong belief in the ability of rewards and sanctions to mould behaviour. Economists have long assumed that the preferences of economic agents are rational and based on self-regarding utility-maximisation (Aaron, 1994: 8). In addition, these preferences and the values, norms, and habits of which they are reflections, were taken as given and beyond analysis and the reach of public policy (Aaron, 1994: 4). As a result, economists have traditionally focussed almost exclusively on material (usually monetary) incentives.

Over the past two decades, however, economists have come to realise how complex human motivation and behaviour are and how this influences the efficacy of incentives. A considerable and

growing body of evidence has shown that people are motivated by both material and non-material incentives. Furthermore, the effects of material incentives depend on how they are designed, the form in which they are given, how they interact with non-material incentives such as intrinsic and social motivations, and what happens after they are withdrawn. For example, monetary incentives can sometimes crowd out intrinsic motivation and actually discourage desired behaviour (Gneezy, 2000). The ambiguous effects of incentives are emphasized by the following quote from Bowles and Polania-Reyes (2012: 369): "Incentives work, often affecting the targeted behaviour almost exactly as conventional economic theory predicts ... But explicit economic incentives sometimes have surprisingly limited effects, and may even be counterproductive." Hence, incentives do matter, but in various and sometimes unexpected ways.

Incentives in society are provided by institutions and vary according to how these institutions are enforced. Voigt (2018: 146), for example, classifies institutions by the way they are sanctioned (see Table 1). An institution is "external" if the state sanctions rule-breaking, and "internal" if members of society do so. External institutions typically generate material incentives (e.g., fines), whereas internal institutions more commonly create non-material incentives through conventions and social norms (e.g., shunning). Both internal and external enforcement are at play in the enforcement of traffic policy: People obey traffic laws not only because they will be sanctioned if they do not, but also because it is conventional, ethical or customary to obey laws. State legislation need to become operative only if these internal institutions hamper the achievement of desired outcomes. Du Plessis et al. (2019) highlight that internal enforcement of traffic laws is preferable to exclusive reliance on enforcement of laws, because the latter is neither feasible nor pleasant.

Table 1 Types of internal and external institutions

Kind of Rule	**Kind of Enforcement**	**Type of Institution**
Convention	Self-enforcing	Type 1 internal
Social norm	Self-commitment of the actor	Type 2 internal
Social norm	Via informal societal control	Type 3 internal
Private rule	Organised private enforcement	Type 4 internal
State Law	Organised state enforcement	External

Source: Voigt (2018: 146).

Internal and external institutions should not be seen as substitutes, however. Weak external enforcement can undermine and erode social norms. Likewise, strong external institutions can reinforce conventions. For example, information and persuasion campaigns aimed at changing public perceptions and norms are often ineffective on their own (Avineri and Goodwin, 2010, Nævestad et al., 2014).

Our experiment investigates two aspects of internal enforcement: Are people more receptive to financial incentives when they are presented positively as a discount, or negatively as a penalty? Although the material consequences of receiving a discount for early payment or incurring a penalty for late payment are essentially the same, the different framing may have psychological effects that result in different rates of compliance. We know, for example, that calling the same economic game "Community Game" or "Wall-Street Game" significantly changes how pro-socially people play (Liberman et al., 2004). However, it turns out that introducing a penalty instead of a discount does not make our subjects less likely to settle their fines voluntarily.

The second dimension we examine is whether increasing the rate of detection of non-payment has positive effects on compliance even in the absence of financial incentives and whether such effects are enhanced when financial incentives are added. We find positive evidence for both the former and the latter, which suggests that financial incentives and higher detection rates complement each other. As we show below, intensifying enforcement when financial incentives are in place can have the seemingly paradoxical effect of relieving the burden on the administrative system.

Road Traffic Safety and Policy Globally and in South Africa

This section provides a brief overview of the road safety situation in South Africa and the country's current traffic policy environment.

The Current Traffic Situation

In 2016 there were 1.35 million road traffic fatalities worldwide. Low- and middle-income countries disproportionately (93%) carried the greater share of these deaths: Although they accounted for more than 85% of the global population, they had only 60% of all vehicles registered worldwide (WHO, 2018: 7). A comparison of fatalities per 100 000 of population shows that low-income countries in Africa (with a rate of 29.3) have a much higher risk compared with middle-income countries in Europe (14.4). In fact, according to the WHO (2018: 7), low-income countries have not experienced a decline in fatalities since 2013, whilst 48 middle- and high-income countries experienced reductions in road traffic deaths.

It is well known that South Africa has a high number of road fatalities. The WHO (2018: 235) reported that the country's fatalities per 100 000 of population in 2016 was 25.9. In that year there were 11 676 fatal crashes in total, of which the greatest proportion occurred in the provinces of Gauteng and Kwazulu-Natal. Approximately 21% of these crashes were ascribed to single vehicles that overturned. The literature on the causes of these fatalities emphasises the influence of alcohol and speeding (Wesson et al., 2016: 1). Verster and Fourie (2018: 5) investigated the 2015 road fatality statistics and ascribed approximately 80% of them to human factors, i.e., characteristics and behaviour of road users (drivers, other occupants of vehicles, pedestrians and other road users). More than half of such incidents were caused by jaywalking and approximately 13% by speeding. These road safety problems come at a great cost to the country. An estimation for 2015 revealed that road crashes cost the country 3.4% of GDP (RTMC, 2016: 36), of which fatalities comprised the largest proportion.

The Traffic Institutional Environment

The Constitution of South Africa (Act 108 of 1996, as amended) apportions responsibility for traffic legislation and its implementation among the three spheres of government (national, provincial, and local), who either share concurrent responsibility or have exclusive powers over the management of roads and traffic. South Africa has several acts and sets of regulations pertaining to road traffic – such as the National Road Traffic Act (Act 93 of 1996) and the National Road Traffic Regulations of 2000 (Justice Project South Africa, 2019) – which are administrated through the Criminal Procedure Act (Act 51 of 1977). The major weakness of this legislative framework is its ineffectiveness in enforcing traffic regulation. Many traffic infringements are not considered by the courts, and fines are inefficiently collected or not paid at all (AARTO Background, undated).

The most recent piece of legislation, which has been approved but awaits implementation, is the Administrative Adjudication of Road Traffic Offences Act No 46 of 1998 (AARTO). This law was promulgated in 2019 make the adjudication of traffic law infringements more efficient and to alleviate the excessive burden on the court system – once it is implemented, only certain serious offences will culminate in court proceedings (AARTO, undated). All other offences will be dealt with administratively by means of admission of guilt fines and accumulation of demerit points culminating in temporary suspension of offenders' driving licences. A great advantage will be that the fines will be set by the National Department of Transport and uniformly applied throughout the country; hence, public prosecutors will no longer have the power to reduce fines. If a fine is paid within 30 days, a discount of 50% will apply, similar to one of the interventions tested in the experiment. Of course, it will become clearer how effective AARTO will be for affecting the behaviour of road-users once it is implemented.

Speeding and Policy Interventions

Speeding is one of the major contributing factors to road safety problems globally. According to the WHO (2017: 5), speeding is a problem in all countries, and a core factor contributing to road accidents. In OECD countries almost 50% of drivers regularly exceed speed limits, and speeding is responsible for 28% of road crashes in the United Kingdom (WHO, 2017: 5). South Africa is one of the countries on the African continent with substantial problems of excessive speed (see Bester and Geldenhuys, 2007). Statistics from road traffic infringements in Cape Town reveal that ten speeding-related offences accounted for approximately 48% of all transgressions of traffic laws over the period July 2014 to July 2016 (Du Plessis et al., 2019: 12).

Reducing excessive speed was listed as one of the voluntary global performance targets for road safety risk factors and service delivery mechanisms by the member states of the United Nations in 2017 (WHO, 2018: 19). The target is to halve the proportion of cars exceeding speed limits, and to reduce the injuries and fatalities caused by excessive speed. Approaches to reducing speeding range from raising awareness of its dangers to building or modifying road infrastructure (for example, speed bumps) (WHO, 2017: 7). Most countries already have speed limits: 97 of the 180 countries that provided information in 2015 applied what the WHO regarded as "best practice" by setting maximum speed limits of 50 km/h in urban areas (WHO, 2015: 22). To be effective, however, these regulations must be enforced. The WHO (2017: 10) emphasises that enforcement of speed limits cannot be effective unless the consequences of violations (such as the imposition of financial penalties or demerit points) are clearly spelt out in legislation and regulations.

Unfortunately, few countries are effective as far as enforcement of speed limits is concerned. According to the WHO (2015: 22), only 15% of the countries that provided information rated their enforcement of speed limits as good (a score of 8 or above on a scale of 0 to 10). South Africa had a relatively low score of 3 out of 10 for speeding enforcement in 2015, but this score increased to 6 in 2018 (see WHO, 2018: 330). Du Plessis et al. (2019: 16) point out that fixed and portable cameras make the detection of speeding relatively easier than the detection of some other violations of traffic laws. However, the potential benefits of these technological aids are largely nullified by non-payment of speeding fines. For example, statistics on traffic law infringements in the City of Cape Town revealed that only 26 percent of all traffic fines issued from July 2014 to July 2016 had been paid by the end of August 2016 (Du Plessis et al., 2019: 16). Although speeding-related fines were relatively better paid than those for other traffic offences were, the extent of non-payment severely diminished the ability of such sanctions to deter violations of traffic laws. Another feature that contributes to the ineffectiveness of the current system of fines in South Africa is that road users are well aware of the reality that they can apply for a reduction in the fine amount.

Viewed from a behavioural economics perspective, non-salience is a possible explanation for the ineffectiveness of traffic fines in South Africa: Many offenders do not immediately become aware of their transgressions and the implications thereof, because processing of offences and delivery of fines take considerable time. Furthermore, since the fine may be perceived as a financial loss that occurs at a future date, drivers may place a higher utility on speeding (that is, they may exhibit present bias). Finally, the collective conformity bias works against the payment of traffic fines if citizens are aware that other citizens do not pay their fines and that the enforcement is lax. This consideration also suggests that improved enforcement of the payment of fines is a requirement for enhancing the efficacy of the penalty system.

There is an expectation that the implementation of AARTO will improve the enforcement of traffic legislation as the rules regarding penalties will be known and applied uniformly throughout the country. In the absence of complementary measures, AARTO will change the administrative rules, but not the scope for deterring and detecting transgressions (which requires more visible policing, more speed cameras, et cetera). As was pointed out earlier, one of the aims of AARTO is to increase the cost of transgressing by introducing a demerit point system which would result in the suspension of the driver's licences of repeat offenders. Without improved detection of traffic violations, however, such offenders may be tempted to continue to drive without licences. Furthermore, a US study has shown that speeding tickets were relatively ineffective in reducing repeat transgressions, and that the severity of the penalty can affect the risk of recidivism (Lawpoolsri, 2007: 26). The study highlighted that a combination of fines and probation before judgement reduced the probability of repeating transgressions (compared to the alternative of facing no legal consequences). By contrast, a fine accompanied by a demerit point system did not significant affect the probability of repeat citations (Lawpoolsri, 2007: 32).

It is therefore possible that the change in formal institutions implied by the implementation of AARTO will have very little effect; in fact, it might go the same route as the failed attempt to implement an electronic toll system (E-Toll) in Gauteng, where the government failed to enforce payment in the face of concerted public opposition. Over time traffic law offenders have become accustomed to the fact that their offences have very limited consequences. It therefore appears to be important for the success of AARTO that the (perceived) likelihood of enforcement of speeding fines is sufficiently high. However, it is unclear whether there are enough resources and political will to ensure this.

For this reason, the new incentive system may prove crucial. In addition to providing financial incentives, the early payment discount may also have positive psychological effects that improve compliance. For example, offenders may decide to voluntarily pay their fine early to avoid feeling regret later (Loomes and Sugden, 1982). In this case, offenders would not actually experience whether their fine is enforced or not, which could help against the widespread perception of weak enforcement. As a secondary benefit, if a significant number of offenders make use of the discount, the enforcement of those who do not becomes more effective since there are fewer cases to review.

However, an early payment discount may also prove less effective than a late payment penalty. While both discount and penalty may induce anticipated regret, it is conceivable that a discount is psychologically perceived as a gain (saving money) whereas a penalty is perceived as a loss (losing money). In this case, loss aversion (Kahneman and Tversky, 1992) could make the penalty the more effective incentive. Alternatively, the discount may be perceived as kinder than the penalty, which would make the former more effective than the latter if offenders have reciprocal preferences (Fehr and Gächter, 2000). The remainder of this paper compares the two incentive systems.

Traffic Experiment

This experiment simulated alternative traffic fine incentive structures and evaluated responses to determine the efficacy of altering the formal institutions governing the sanctioning of traffic offences. In the experiment we tested the effects of stricter enforcement and different financial incentives.

Experimental Design

In this experiment, subjects play six rounds of a simple decision-making game. In each round, they start with an endowment of R200 and then earn additional funds by engaging in a real-effort slider task (as in Gill and Prowse, 2012) for 60 seconds. They receive an additional R50 for each 3 sliders solved up to a maximum extra endowment of R200. Next, subjects are told that they were caught speeding and fined R100. They can choose not to pay the fine or to do so from their endowment. In the treatment DISCOUNT, their fine is reduced to R50 if they decide to pay. If they do not pay the fine immediately, there is a 50% (LOW SUMMON) or 80% (HIGH SUMMON) probability that they will be "summoned by the court". Upon being summoned, subjects have to pay the fine of R100 and, in the treatment PENALTY, another R100 as a late payment penalty. If a subject is not summoned, they do not have to pay the fine. The control treatment NONE has neither an early payment discount nor a late payment penalty.

All treatment variations are within-subject, but the treatment variations DISCOUNT and PENALTY do not occur together. As a result, we have a 2x3 design with six different combinations. The treatment variations are also summarised in Table 2.

Table 2: Treatment summary

Endowment	R200 – R400		
	DISCOUNT	**PENALTY**	**NONE**
Fine paid immediately	-R50	-R100	-R100
Fine not paid and summoned	-R100	-R200	-R100
Fine not paid and not summoned	-R0	-R0	-R0
	LOW SUMMON		**HIGH SUMMON**
Probability of being summoned	50%		80%

In total, 218 subjects participated in the five sessions of the experiment at the FHARGA computer centre at Stellenbosch University.[4] Subjects were recruited via email and posters. The experiment was programmed in zTree (Fischbacher, 2007). A session lasted approximately 60 minutes. After reading written instructions, subjects played one practice round, followed by six main rounds, with a counterbalanced treatment order. At the end of the experiment, one of the six main rounds was randomly selected and paid out. On average, subjects earned R228.44 (min R50, max R400) plus a show-up fee of R50.

Theoretical Considerations

To form hypotheses about behaviour in the experiment, we consider the predicted behaviour of the standard economic decision maker who is materially self-interested and rational ("homo economicus")

[4] Stellenbosch University granted ethical clearance for the experiment (Project number: ECO-2019-9241).

and contrast it with potential behavioural deviations. We skip detailed calculations of expected payoffs and expected utility where they are trivial.

In the NONE treatment, there is no downside to not paying the fine immediately. Hence a homo economicus should never pay the fine voluntarily, irrespective of endowment, summoning probability, or risk preferences. This yields our first hypothesis:

> H_{1a}: In the NONE treatment, voluntary payment of the fine does not occur.

If some decision makers are intrinsically motivated to pay the fine voluntarily because they consider it a social norm to do so, we should see some level of voluntary payments. If this intrinsic motivation is sensitive to the likelihood of prosecution of non-compliance, voluntary payments should increase when the summoning probability is high.

> H_{1b}: In the NONE treatment, some voluntary payment occurs and it occurs more often in HIGH SUMMON than in LOW SUMMON.

In DISCOUNT and PENALTY, risk-neutral standard decision makers are indifferent between paying the fine immediately when the summon probability is 50%. They prefer to pay immediately when the probability of being summoned is 80%. When decision makers are risk-averse, they always prefer to pay the fine immediately. Assuming the population consists of a mixture of risk-neutral and risk-averse individuals, these considerations yield the next hypothesis:

> H_{2a}: In DISCOUNT and PENALTY, the rate of voluntary payment is high in LOW SUMMON and 100% in HIGH SUMMON.

In the same way that some decision makers may be intrinsically motivated to pay the fine voluntarily, others may be intrinsically reluctant to pay. Although it is in principle conceivable that individuals are so deviant that increasing the summoning probability further discourages them from paying their fines, it seems more probable that there exists a synergy between financial incentives and summoning probability on the intrinsic willingness to pay the fine. Both interventions signal that settling the fine voluntarily is the normatively correct behaviour and so the two signals may complement each other.

> H_{2b}: In DISCOUNT and PENALTY, the difference in voluntary payment rate between LOW SUMMON and HIGH SUMMON is greater than in NONE.

Whether the immediate payment is halved (DISCOUNT) or the unpaid fine is doubled (PENALTY) makes no difference to the expected payoff when the summon probability is 50%. When the summon probability is 80%, paying voluntarily is the strictly preferred choice for risk-neutral and risk-averse standard decision makers. So the homo economicus should make identical decisions in DISCOUNT and PENALTY.

> H_{3a}: Subjects' decisions in PENALTY are the same as those in DISCOUNT.

Decision makers may perceive a discount as a gain and a penalty as a loss. In this case, decision makers with loss aversion would react more strongly to the penalty than to the discount. Alternatively, granting a discount is a kinder, more positive intervention than imposing a penalty. Given that many people have a preference for reciprocity, intrinsic motivation to settle the fine voluntary should therefore be higher in DISCOUNT than in PENALTY.

> H_{3b}: Subjects' willingness to pay the fine voluntarily is different in DISCOUNT than in PENALTY.

Results of the Experiment

In treatment NONE (that is, without an early payment discount and a late payment penalty), the fine was paid immediately in only 11.9% of the decisions. In contrast, the share of immediate payments rose to 76.1% with an early payment discount and to 80.3% with a late payment penalty. On aggregate across all three treatments (NONE, DISCOUNT, PENALTY), the share of immediate payments increased from 47.1% to 65.1% when the probability of being summoned increased from 0.5 to 0.8.[5] Table 3 provides a summary of these results and a breakdown for the various treatments.

Table 3: Share of immediate payments

N = 218	**NONE**	**DISCOUNT**	**PENALTY**	**TOTAL**
Probability of summons = 0.5	7.8%	63.8%	69.7%	47.1%
Probability of summons = 0.8	16.1%	88.5%	90.8%	65.1%.
Total	11.9%	76.1%	80.3%	

The results do not exactly confirm the hypotheses H_{1a} and H_{2a} of the standard model, yet largely corresponds to them. Voluntary payment is rare in NONE and common in DISCOUNT and PENALTY. However, we also find evidence for hypothesis H_{1b}: The share of voluntary settlement in NONE more than doubles going from LOW SUMMON to HIGH SUMMON despite non-payment being the dominant choice in both cases. Compliance rates under DISCOUNT and PENALTY are very similar with seemingly no evidence of framing effects.

To examine the results further, we conduct a random-effects panel logit regression. Table 4 reports the results. Model (1) confirms the results from the summary statistics. Subjects were significantly more likely to pay their fine immediately if either an early payment discount or a late payment fine was in place. Consistent with hypothesis H_{3a} but not H_{3b}, we cannot reject the assumption that the coefficients of DISCOUNT and PENALTY are equal (Wald-test, $p = 0.1$). If anything, subjects are slightly more likely to pay in PENALTY than in DISCOUNT. In support of H_{1b}, increasing the probability of being summoned also significantly increases the likelihood that the fine is paid voluntarily. However, the coefficient is noticeably smaller than those of DISCOUNT and PENALTY (Wald-test, $p < 0.001$). Although such comparisons should be treated cautiously, this result suggests that the financial incentives have a much stronger effect than any non-monetary motivations.

Model (2) includes subjects' endowments to examine whether income effects influenced payment decisions. It also includes dummies to check for learning effects or trends. However, the coefficients of endowment and round are both not statistically different from 0. This implies that it did not matter whether subjects earned more or less in the real effort task, nor did their behaviour change over time.

In model (3), we disaggregate the effect of high probability of being summoned by interacting the dummy variable for HIGH SUMMON with the treatment dummy of NONE. The results show that increasing the probability of being summoned has a weaker effect on its own compared to when paired with financial incentives. This is consistent with hypothesis H_{2b}. Model (4) uses the interaction of PENALTY and DISCOUNT instead, but the two coefficients are very similar.

[5] Oddly, increasing the probability of being summoned even has an effect on voluntary payment when there are no monetary incentives to pay (NONE). These instance are likely mistakes, consistent with the assumption that mistakes become more likely as the costs of making them decrease.

Table 4: Determinants of immediate payment of fine

Dependent variable: Immediate payment of fine	(1)	(2)	(3)	(4)
Early Payment Discount	4.047***	4.044***	3.589***	3.582***
	(.263)	(.263)	(.331)	(.336)
Late Payment Fine	4.349***	4.346***	3.897***	3.905***
	(.274)	(.274)	(.337)	(.344)
High Probability of Summon	1.501***	1.500***	1.699***	0.917***
	(.178)	(.178)	(.208)	(.332)
DISCOUNT				0.805*
				(.430)
PENALTY				0.756*
				(.444)
NONE			-0.782**	
			(.388)	
Endowment (in R100)		0.0658		
		(.164)		
Round		0.031		
		(.048)		
Constant	-3.286***	-3.593***	-2.891***	-2.891***
	(.245)	(.557)	(.294)	(.294)
N	218	218	218	218

Note: The table reports results from random effects logit regressions. Standard errors are in parentheses; $* p < 0.1$, $** p < 0.05$, $*** p < 0.01$.

Policy Implications and Conclusion

The results of the experiment suggest that merely increasing the frequency of summons by the courts will have a positive, albeit fairly limited, effect on compliance by traffic law offenders. This is not surprising since there are no financial downsides to waiting to see whether a court summons will be forthcoming. That we still see an effect, however, indicates that some subjects are intrinsically motivated to follow the perceived social norm of paying fines on time.

In real life, a summons brings the additional inconvenience of having to appear in court. The observed low compliance rate suggests that this alone does not suffice to encourage most offenders to settle fines voluntarily. Furthermore, increasing the frequency of summons would only further clog up the court system with relative trivial traffic offenses.

Instead, modifying the financial incentives promises to motivate a much larger portion of transgressors to pay fines on time. Rewarding voluntary compliance with a discount or penalising non-compliance with a higher fine appears to yield comparable results; hence, the choice between these two options potentially could be based on other considerations. The administration would gain more revenue from penalising non-compliance, for example, whereas citizens may look more favourably on a system that rewards voluntary compliance (although the experiment yielded no evidence of such an effect).

The results also suggest that a combination of financial incentives and an initiative to increase the detection rate may yield a positive effect on compliance that exceeds the sum of the two separate effects. This, too, points to the existence of intrinsic motivation that is sensitive to signals about

normative behaviour. On top of that, with financial incentives in place, it may even be possible to further decrease the workload of the courts by increasing the frequency of summons. This may sound contradictory but consider the following numerical example from the experiment. With the late payment fine active, compliance increased from 69.7% to 90.8% when the probability of being summoned increased from 50% to 80%. This lowered the share of subjects summoned from 15.15% (50% of 30.3%) to 7.36% (80% of 9.2%). A similar decrease (from 18.1% to 9.2%) occurred with the early payment discount.

We must stress that our study addresses only the narrow question of compliance. In the experiment, subjects could only adjust their decision about whether or not to pay their fine immediately. In real life, changing the financial incentives might have further, possibly unintended, consequences. For example, if (some) drivers essentially perceive speeding fines as the price of driving fast, the introduction of an early payment discount effectively makes speeding cheaper.[6] Such drivers may well "buy" more speeding if a discount is introduced, and this could lead to increases in traffic law violations and road fatalities. Furthermore, while we found no effect on compliance, it is possible that the discount/penalty framing may matter for transgressions. For example, giving a discount on speeding fines may send the message that speeding is a "forgivable"" minor offence, whereas a penalty may enhance the perception that speeding is inappropriate behaviour.

Viewed from the perspective of compliance, the results from the experiment suggest that a discount could be an important instrument to improve payment of fines that is unlikely to perform significantly worse than a penalty for non-payment would. It remains to be seen, however, how strong such effects would be in real life and whether these measures would have other effects on transgressions and perceptions of the system of traffic law enforcement.

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[6] Gneezy and Rustichini (2000) found that some parents who picked their children up late at day-centres in Israel viewed a fine as a price.

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