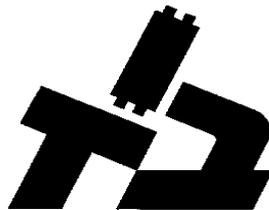


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**Motivating Environmental Action in a Pluralistic
Regulatory Environment**

**An Experimental Study of Framing, Crowding Out, and
Institutional Effects in the Context of Recycling Policies**

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Abstract

In designing a recycling policy, the regulator has to choose between multiple instruments. Our study seeks to address the linkage between the choice of regulatory instruments and institutional frameworks, people's intrinsic environmental motivation and various attitudinal measures. We examined the behavioral repercussions of the primary instruments used in recycling regulation, using an experimental survey on a representative sample of the Israeli population (n= 1800 participants). Our findings suggest that the design of recycling policies should be sensitive to the framing effects of varied regulatory instruments and to the interplay between intrinsic and extrinsic motivation on the desirability and efficacy of the law. These findings are particularly important in terms of policy design when there is broad heterogeneity in levels of intrinsic motivation among the target population.

1. Introduction

Recycling has long been considered a key component in the regulatory effort to curtail excessive waste production. Despite the relative simplicity of the act of recycling, the design of optimal recycling programs has proven to be a difficult challenge. In designing a recycling policy, the regulator has to choose between diverse instruments, ranging from command and control measures, economic instruments (taxes, deposits), and voluntary schemes. This article focuses on this policy-design dilemma, drawing on the insights of behavioral economics and institutional analysis.

Probably the most dominant approach to the “instrument choice dilemma” is the method of comparative cost-benefit analysis, which draws on the precepts of Neo-classical economics. This article uses an experimental survey setting to critically examine some of the Neo-classical assumptions in the recycling context, drawing on three main critiques. First, we will argue that the tendency of Neo-classical economic modeling to focus on material self-interest as the primary catalyst of human action (Williamson 1998, : 31; Allen 1993, : 1401) is inconsistent with a large body of literature, which demonstrates that human agents are driven by a complex set of motivations, reflecting also 'other-regarding' and 'duty-oriented' concerns - such as environmental commitment (Ghoshal 2005, : 85; Rocha and Ghoshal 2006). Recognizing that people may be driven by intrinsic motivations¹ raises the question of the interaction between economic incentives and intrinsic motivation. We explore this interaction in the context of recycling policies, drawing on a large body of literature

¹ Some motives, such as image motivation, may be extrinsic but non-materialistic (Ariely, Bracha, and Meier 2009; Bergstrom, Garratt, and Sheehan-Connor 2009).

that demonstrates that that these distinct motivational domains are not necessarily complementary (Bowles 2008). We will argue that the potential destructive influence of extrinsic incentives and controls on people's internal motivational universe should be taken into account, both in the choice between regulatory instruments and in their ultimate design.

Second, we will critically examine the rationality assumption of Neo-classical economics by exploring the behavioral implications of statutory framing (McAdams and Rasmusen 2007; Feldman 2009). Finally, drawing on the institutionalist critique of Neo-classical economics, which highlights the important role of institutions in the dynamic of regulatory intervention we will examine the interplay between instrument design and institutional context (Ghoshal and Moran 1995, : 15; Perez, Amichai-Hamburger, and Shterental 2009).

In order to explore these themes, we conducted an experimental survey on a representative sample of the Israeli population, which sought to analyze the way in which different legal instruments influence people's motivation to recycle. Our study explores the potential discomplementarity between intrinsic and extrinsic motivation in the context of different models of regulatory. We draw in this context on the insights of the 'expressive law' literature. This literature highlights the ways in which the law influences moral intuitions and shapes social norms (Sunstein 1996; Bénabou and Tirole 2010) and exposes the complex interplay between the deterrence effect of the law and its expressive moral message (Kirsch 2004). The way in which the law interacts with people's intrinsic and extrinsic motivations constitutes a complex dilemma, which remains unaccounted for in the conventional deterrence story.

This study is built on a tripartite distinction between regulatory instruments, institutional settings, and individual types (ordered by the strength of their intrinsic environmental motivation). In particular, we seek to explore the linkage between the choice of regulatory instruments and institutional frameworks, people's intrinsic environmental motivation, and various attitudinal measures (e.g. desirability, efficacy, fairness perception). Our study distinguishes between three instruments: deposit, obligatory scheme backed by fine and voluntary codes; these instruments are explored in three institutional settings, distinguishing between a state setting and two private settings (organization and academic institution). The comparative outlook of our study (which cut across several regulatory and institutional dimensions) offers a novel framework for studying these questions, which departs from most of the recycling literature.² For several reasons, the field of recycling constitutes an interesting case study worthy of exploration. First, recycling has been (and continues to be) a highly experimental arena, involving multiple regulatory programs and varied institutional domains. Second, because recycling is deeply embedded in daily life, social norms and moral sentiments are likely to play an important role in shaping people's attitudes and behaviors. Third, the underlying structure of the recycling dilemma, which puts it in the category of "large-number, small-payoff" problems of collective action (Carlson 2001), allows us to draw conclusions from this context to a larger set of environmental dilemmas involving "household externalities,". These include questions such as energy efficiency, water saving and car-sharing.

The study makes several contributions to the policy arena. First, it contributes to our understanding of how to design legal instruments in a way which would be sensitive to the complex interplay between intrinsic and extrinsic motivations given

² Compare, for example, to Viscusi et al, who adopt a uniform perspective to recycling regulation (Viscusi, Huber, and Bell 2010).

the expected heterogeneity in levels of intrinsic environmental motivation among the population. We will argue in that context that in searching for optimal recycling (and other) strategies, policy makers need to take into account the potential discomplementarity between extrinsic and intrinsic motivations. One of the key conclusions of this study is that regulators should abandon the search for one-size-fits-all policy mechanisms and, instead, should use differentiated policy structures that respond to the heterogeneous psychological and situational factors that characterize actual regulatory environments. Second, the article seeks to advance our understanding of the “regulatory capacities” of non-state institutions, highlighting their potential contribution to the improvement of environmental programs.

2. Theoretical Background and Hypotheses

Our study takes the instrument choice dilemma as a starting point, which we then use to study various questions that challenge the conventional cost-benefit analysis perspective. We draw in the context on the insights of behavioral economics and institutional analysis, using an experimental survey methodology. In particular, we focus on how people's motivational profile and social situatedness should influence the design of regulatory policies. Before giving a more elaborate exposition of our arguments and hypotheses we want to review some of the recent developments in recycling regulation. Examination of the recycling field³ reveals a highly pluralistic

³ For some general accounts of this regulatory diversity, *see* the Environmental Protection Agency's (EPA) current recycling policy, The Resource Conservation Challenge (RCC)', available at <http://www.epa.gov/epawaste/rcc/index.htm>; The European Union Waste Management Policy, available at <http://ec.europa.eu/environment/waste/index.htm> and *Europe as a Recycling Society- Recycling Policies for Selected Waste Streams in EEA Member Countries* , available at http://eea.eionet.europa.eu/Public/irc/eionet-circle/etc_waste/library?l=/recycling_publications/recycling_streams/pdf/EN_1.0_&a=d; The British. strategy available at <http://www.wasteonline.org.uk/index.aspx>.

mix of strategies, including voluntary schemes, deposits, fines, and technology standards. Economic instruments are used widely in this context, in particular, deposit-refund systems. In the United States, eleven states have so called “bottle bills.”⁴ Oregon’s bottle bill was introduced in 1971 as the very first bottle bill in the U.S.⁵ Various other countries have introduced a deposit system, including Denmark, Germany, Israel, and South Australia (Crocchi et al. 2005; Groth 2008; Gardiner et al. 2009). Taxes are also used in the context of household waste. In Switzerland, several cantons have introduced a “waste” tax, which varies according to the volume of trash each household produces. The goal of the tax is to incentivize the disposal of recyclable waste at recycling points (which was free).⁶

There are also various examples waste programs using a combination of 'command and control' techniques and technology standards. Thus, for example, during 2011 a high-tech trash collection system will be implemented in Cleveland, Ohio. The high-tech trash system will sort through residents' curbside trash to make sure that the trash does not contain recyclable goods. Curbside trash and recycling carts will be embedded with radio frequency identification chips and bar codes. The chips will allow city sanitation workers to monitor how often the residents roll the carts to the curb for collection. If a chip shows that a recycling cart has not been brought to the curb in weeks, a “trash supervisor” will sort through the trash for recyclables. If the trash cart constitutes more than ten percent recyclable material, the

⁴ Bottle Bill Resource Guide, available at www.bottlebills.org. Last visited Mar. 8, 2011.

⁵ See OR. REV. STAT P. 459.810 to 459.890 (1971). For more information about Oregon's Bottle Bill See Oregon Liquor Control Commission, available at http://www.oregon.gov/OLCC/bottle_bill.shtml/#Retailer_s_Responsibilities_Resources. (Bottle Bill & Redemption Center Info).

⁶ See, Swiss World, available at http://www.swissworld.org/en/environment/recycling/household_waste/.Last Last visited Mar. 8 2011 (SwissWorld, Environment, Household Waste).

resident could be subject to a fine up to a hundred dollars.⁷ A similar technology-based recycling scheme is planned in the U.K.⁸ Another example of the use of fines in the recycling context is New York City, where recycling of used electronics is mandatory. Since the beginning of 2010, city residents have been subject to \$100 fines for throwing used electronics in the trash. The New York City electronics recycling bill was also the subject of public dispute, which reached the New York Court of Appeals.⁹

Voluntary mechanisms are also widely used. In Israel, the recycling of bottles larger than 1.5 liters is based on a voluntary scheme.¹⁰ In the U.S., the recycling of "E-waste" is largely based on voluntary mechanisms (Werner et al. 1995; McCarthy 2002). Another example is Australia's National Packaging Covenant (1999), which sets out a voluntary scheme for Australian corporations focusing on improving their packaging practices (Crocini et al. 2005).

⁷ See Nicole Wong, Non-Recycling Residents Must Pay Fines, Technorati (Sep. 8 2010) available at <http://technorati.com/lifestyle/green/article/non-recycling-residents-must-pay-fines/#ixzz16Vc0EJhL>; Jack Loftus, Cleveland Smart Bins will Fine Non-Recyclers 100\$, Gizmodo (Aug. 22, 2010, 5:00 PM), available at <http://gizmodo.com/5619013/cleveland-smart-bins-will-fine-non-recyclers-100>. Another example of technology-based standard is announcement of the city of Toronto that it intends to ban coffee shops from selling coffee in paper cups with plastic lids by the end of 2009, because recyclers couldn't cope with mixed paper and plastic. See Controversial Coffee Cup Proposal Put on Hold, CBCNews (Nov. 13 2008) available at <http://www.cbc.ca/news/canada/toronto/story/2008/11/13/coffee-recycling.html?ref=rss>

⁸ Victoria Gatenby, Chip-And-Bin: UK Set for New Rubbish Tax, Sky News (Feb. 27 2008) available at http://news.sky.com/skynews/Home/Chip-And-Bin-UK-Set-For-New-Rubbish-Tax/Article/20070541267168?lpos=Home_Article_Related_Content_Region_8&lid=ARTICLE_1267168_Chip-And-Bin%3A_UK_Set_For_New_Rubbish_Tax.

⁹ See *Council of the City of New York v. Bloomberg*, 6 N.Y.3d (2006). See also Clayton Hale, *New York City Council Passes Electronics Recycling Law Despite Opposition from Mayor Michael Bloomberg*, *Vermont Journal of Environmental Law* (Feb. 28 2008) available at <http://www.vjel.org/news/NEWS100125.html>.

¹⁰ See, Israel's waste strategy, available at http://sviva.gov.il/bin/en.jsp?enPage=e_BlankPage&enDisplay=view&enDispWhat=Zone&enDispWho=law_deposit&enZone=recycling&.

The Framing Effect of Discursive Variance

Framing refers to the behavioral and attitudinal effects associated with the form of presentation (rhetorical nuances), rather than the substantive meaning of the legal norm. As such, this phenomenon reflects a departure from the predictions of expected utility theory. The idea of framing has been explored in diverse contexts, ranging from the framing of jury instructions (McCaffery, Kahneman, and Spitzer 1995) and tax instruments (McCaffery and Baron 2006) to the study of framing as a de-biasing tool (Jolls and Sunstein 2006).

Applying the theoretical insights developed by the framing literature to the recycling dilemma highlights several differences between the deposit and fine instruments which could have important implications for the way these instruments are perceived. First, the literature points out that framing outcomes as losses rather than as gains generally affects how people respond (Jolls and Sunstein 2006, : 205). Further, loss aversion is generally reference-dependent: people tend to be significantly more averse to losses (relative to the status quo) than they are attracted by gains; losses with respect to a current endowment loom larger than gains (Novemsky and Kahneman 2005; Ariely, Huber, and Wertenbroch 2005). The idea of loss aversion as reference-dependent suggests that the deposit instrument would have stronger public appeal than the fine because the two instruments construct different reference points (or asymmetric futures). Even though both the deposit and fine schemes involve immediate or expected payments (i.e. losses) and have a similar economic effect of putting a price tag on non-recycling, the fine instrument emphasizes the loss, while the deposit instrument emphasizes the gain (received by returning the bottle). McCaffery and Baron's argument with respect to penalty aversion provides further

support to this argument. Penalty aversion refers to a situation in which people prefer bonuses over penalties, when policies differ only in how they are formally described (McCaffery and Baron 2004).¹¹ The fine scenario parallels the penalty in McCaffery & Baron's setting, with the reference point being the "pre-fine" base line. In contrast, the deposit scenario parallels the bonus setting with a "post deposit" as the reference point.¹²

Another possible explanation for this prediction could be that the deposit instrument seems to give people a stronger sense of control over the outcome. While the fine instrument presupposes the existence of a third party (the enforcement authority); the deposit instrument leaves the decision to the individual. This thesis is supported by another body of research which highlights the positive expressive effect of reward, specifically its contribution to people's perceived self-determination (De Young 1993). In that context, Bateman and Crant argue that "[e]xtrinsic rewards have symbolic value; receiving rewards that we have earned means that we are no longer at the mercy of a capricious or over-controlling environment, and we have gained control over our outcomes." (Bateman and Crants 2005, :8).¹³

Finally, the distinction between fines and deposits also brings to the fore the question of people's attitude towards uncertainty, especially uncertainty that involves low probabilities (Tversky and Fox 1995). The preference for the deposit instrument

¹¹ From an economic point of view, bonuses and penalties are simply two sides of the same coin: a bonus is the absence of a penalty; a penalty is the absence of a bonus.

¹² A parallel example would be tax exemptions for children. This can be constructed either as exemptions relative to a status quo without children, or as penalties relative to a status quo with children (McCaffery and Baron 2004). Another interesting bias identified by McCaffery is an aversion to the word "tax" itself. While the penalty aversion is connected to the loss aversion bias, because penalties seem like losses relative to a certain baseline, while bonuses seem like gains from a different baseline, tax aversion refers to the way in which the regulatory burden is named: the term "tax" itself (McCaffery and Baron 2006, : 10). Drawing on this finding, the term "deposit" would seem to create less aversion to a "bottles" tax, which is actually the underlying logic of deposit schemes as a tax on the polluting act of throwing bottles into the general waste collection cycle.

¹³ See, further (Eisenberger, Pierce, and Cameron 1999).

over the fine instrument may reflect the probabilistic nature of the fine. It could be a reflection of *probability neglect*, which occurs when people are highly sensitive to the outcome and are relatively indifferent - in terms of attitude and behavior – to significant variations in its likelihood (Sunstein 2003, : 1298; Sunstein 2002, : 62-63).¹⁴ This neglect means that the expected value of the fine is perceived as larger than that of the deposit - given the large nominal gap between the fine and the deposit - generating a preference for the deposit. Drawing on the foregoing theoretical reflections, we posit that deposit schemes will enjoy greater public support.

Hypothesis 1: Deposit-based schemes are likely to be viewed by participants as more desirable than fine schemes, even when the expected cost of both schemes is identical.

Crowding Out and the Optimal Size of Legal Incentives

The crowding out hypothesis draws on a distinction between “intrinsic” and “extrinsic” motivations (Deci 2000). *Extrinsic motivation* refers to the performance of an activity in order to attain some separable outcome (Ryan and Deci 2000, : 71). By contrast, *intrinsic motivation* does not depend on external incentives and is therefore self-sustained (Frey and Jegen 1999, : 4; Osterloh, Frey, and Frost 2001, : 233). The literature distinguishes between two types of intrinsic motivation: *enjoyment based* and *obligation based* (Osterloh, Frey, and Frost 2001, : 233; Ryan and Deci 2000, : 70). Obligation-based intrinsic motivation, which is more applicable

¹⁴ An alternative explanation is the overweighting of low probabilities which was documented by numerous studies (Burns, Chiu, and Wu 2010; Tversky and Fox 1995).

to this context, reflects a sense of moral or civic duty, not driven by instrumental considerations (i.e. commitment to environmental ethics) (Osterloh, Frey, and Frost 2001, : 233-34; Thøgersen 2003, : 200). Obligation-based intrinsic motivation is related to what has been defined in the psychological study of compliance as moral or fairness-driven legal compliance.¹⁵ A vast body of literature demonstrates that moral sentiments (intrinsic motivation) and extrinsic incentives (economic or others) are not necessarily synergetic (or co-enhancing); it highlights, in contrast to the predictions of Neo-classical economics,¹⁶ the potential discomplementarity of intrinsic and extrinsic motivations (Frey and Stutzer 2006; Bowles 2008). Richard Titmuss was the first to identify this phenomenon (Titmuss 1970), arguing that paying for blood could undermine cherished social values and may therefore reduce people's willingness to donate blood. While Titmuss was unable to come up with serious empirical evidence, his thesis triggered a series of studies using empirical research to look at his specific argument and the “crowding out hypothesis” in general (Mellstrom and Johannesson 2008; Lacetera, Macis, and Slonim 2009; Goette et al. 2009; Piliavin 1990; Healy 2006). By suggesting that (in some cases) raising monetary incentives will reduce rather than increase socially desirable behavior the crowding out effect constitutes an interesting anomaly, which works against the classic economic behavioral model (Frey and Jegen 2001).

The tension between intrinsic and extrinsic motivation was also shown to be relevant to the question of compliance in different regulatory contexts, ranging from tax evasion (Wenzel 2005) to labor law (whistle blowing) (Feldman and Lobel 2010).

¹⁵ Fairness-driven compliance refers to the claim that people will be more compliant when they think the law coheres with either their distributive justice intuitions (Robinson 2001) or with their conceptions of procedural justice (Tyler 2006).

¹⁶ See, for example, the model of recycling developed by Viscusi et al, which disregards the crowding out effect of extrinsic intervention through deposit (Viscusi, Huber, and Bell 2010).

Feldman and Lobel found, for example, that moral duty had an independent effect on the willingness of people to engage in whistle-blowing and increased the potency of other mechanisms, including both fines and rewards. The existence of moral duty caused participants to increase their appreciation for whistle-blowers, while the introduction of a reward had the opposite effect, showing reduced respect for the informant.

The crowding out literature suggests several behavioral explanations for the potential erosion of internal motivation by external incentives. First, the "Cognitive Evaluation Theory" (CET) highlights the need for individuals to feel competent and in control with respect to a particular task (Ryan and Deci 2000; Weibel, Rost, and Osterloh 2007, : 7-8; Festre and Garrouste 2007, : 9-10). External incentives may erode people's motivation by undermining their conception of competency and autonomy; the shift from an internal to an external locus of causality could compromise one's sense of autonomy. Command and control regulation, which leaves little room for discretion, negatively influences the conception of the regulatee as someone with reliable decision-making ability and damages his or her sense of autonomy.¹⁷ This theoretical path was explored by Bruno Frey in several empirical studies (Frey 1999; Frey and Jegen 2001).

A second explanation is the *over-justification* theory, which suggests that when people derive pleasure from an action *per se* in the absence of other rewards, the

¹⁷ In contrast, regulation can enhance internalized motivation if it "increases the targeted individuals' perceived competence and/or their experienced autonomy with regard to the desired behaviour" (Thøgersen 2003, : 201). So, for example, properly structured environmental management systems (EMS) can *empower* intrinsic motivation. EMS such as ISO 14001 and EMAS, which are based on the idea of continuous improvement and not on a rigid system of sanctions, providing ample opportunities for the inclusion of employees in the management of environmental aspects of the organization's behavior, can have a positive influence on the level of intrinsic motivation within the corporate workforce (Perez, Amichai-Hamburger, and Shterental 2009).

introduction of explicit incentives may “over justify” the activity and reduce the individual’s sense of autonomy (Bowles 2008, : 1607). That is, a person’s own interest in his or her behavior is undermined when the individual is given an extrinsic reason for doing something he or she would have done anyway (Thøgersen 2003, : 198). A further explanation focuses on the framing effect of external intervention. Intervention in the form of economic incentives may erode the *moral purity* of the worker's internal system of beliefs, by shifting the environmental commitment from a moral plane to an economic one (where it is “appropriate” to perform the environmental action only for pay).¹⁸ This could also undermine the moral legitimacy of one’s internal normative system. Another, related explanation, suggested by Gneezy is the 'fine is a price' hypothesis (Gneezy and Rustichini 2000). Gneezy argues that the introduction of fines can be interpreted as placing a price tag on asocial behavior, thus leading – contrary to the traditional deterrence model – to an increase in the performance level of this behavior. The introduction of the fine may change people's perception of the social context in which their action is embedded. Finally, another potential explanation associates the “Titmuss effect” with an image motivation - a desire to signal altruism. Bénabou and Tirole (2006) argue, for example, that if blood donors are paid, the value of blood donation as a sign of generosity will be weakened, leading to reduced motivation to donate blood.

If we take seriously the idea that intrinsic and extrinsic compliance motivations are not necessarily synergetic or co-enhancing (in contrast to the predictions of neo-classical economics), and that society is comprised of people with

¹⁸ The external intervention in the form of monetary rewards (or sanctions) may also be interpreted, however, as legitimizing the internal normative system (a claim that is also true with regard to command and control intervention) (Nyborg 1999). For a tentative discussion of the effectiveness of providing monetary benefits for ecological accomplishments in a corporate setting, *see* Russo and Harrison (Russo and Harrison 2005).

varied levels of intrinsic motivation, the question of the overall impact of a certain regulatory initiative becomes sensitive to the distribution of different types within the targeted community. Further, this distributional pattern should be taken into account in the design of environmental policies. This social variability raises the question of how different “types” of people react to different regulatory incentives. Replacing the assumption of uniformity with one of heterogeneity is therefore critical for the design of optimal social policies.¹⁹ This view challenges the conventional view of the "one-size-fits-all" model of regulation. Instead, we argue that it brings to the fore a different regulatory paradigm – “differentiated regulation” - which aspires to match the regulatory strategy to different types of individuals.

The crowding out paradigm also raises the question of the optimal size of monetary regulatory incentives. Bruno Frey (1999) has offered, in this context, the “U-shape hypothesis,” arguing that the crowding out effect will have its strongest “bite” at some intermediate level. This hypothesis draws on the potential contradictory impact of the crowding out effect and the price effect. First, the crowding out effect increases with the size of the monetary incentive. The relation between the size of the incentive and the crowding out effect is not linear, however. Low monetary incentives may have a positive expressive message, which is diluted and becomes negative as the incentive is increased. Further, it seems reasonable to assume that once the incentives reach a certain threshold, the crowding out effect will cease to increase. The crowding out effect is countered by the price effect, which increases as the monetary incentive goes up. So, for example, in the case of

¹⁹ There has been a very limited discussion of the crowding out effect, using a multi-type theoretical framework. There has been a very limited discussion of the crowding out effect, using a multi-type theoretical framework; see. e.g. (Hörisch and Strassmair 2008) and (Mellstrom and Johannesson 2008). See also (Ostrom 2000).

environmental taxes, a low tax rate does not generate a perception of control, leading the crowding out effect to be small or turning into a “crowding in” effect due to the expressive aspects of the tax. The relative price effect of a low tax rate, however, is small. When taxes are raised to a high level, they generate a strong price signal (polluting becomes very costly) and the relative price effect is likely to dominate the crowding out effect.

An intermediately-sized environmental tax induces undesirable effects on both accounts. Environmental morale is crowded out as individuals’ self-determination becomes noticeably impaired, while at the same time the tax rates are insufficient to induce pro-environmental behavior due to extrinsic motivation. The increase in tax levels can also shift the frame of observation: it can legitimize the anti-environmental behavior and attenuate its negative moral image by offering a price tag for misbehavior (repositioning the behavior as one governed by market rationality) (Bowles 2008, : 1606). The question of whether an environmental tax rate is to be considered “low” or “high” can only be answered through specific, contextualized analysis. Our study examines this issue by presenting subjects with two levels of fines and deposits (high and low).

Drawing on the crowding out thesis, we project that the introduction of monetary incentives will yield the largest reduction in recycling intentions among the class of subjects with high intrinsic motivation.

Hypothesis 2A: Participants with high intrinsic motivation will exhibit a smaller increase in recycling intentions in comparison to those with low intrinsic motivation, following an increase in the magnitude of the monetary incentive.

Drawing on our previous discussion on framing, we expect an interaction between the *type* of monetary incentive (fine or deposit), the level of intrinsic motivation, and the behavioral effect of the regulatory intervention on recycling intentions. One can find support for two contrasting predictions regarding the direction of this interaction. On the one hand, since fines are more coercive than deposits, they are more likely to enhance the adverse effect of the economic incentive on subjects' autonomy. On the other hand, deposits have a stronger commodification effect than fines, which could dilute the underlying moral virtue of recycling and enhance the adverse effect of the incentive on intrinsic motivation.

Hypothesis 2B (1): Participants with high intrinsic motivation in the *fine* condition will exhibit a smaller increase in recycling intentions, in comparison to participants with similar level of intrinsic motivation in the *deposit* condition following an increase in the magnitude of the monetary incentive.

Hypothesis 2B (2): Participants with high intrinsic motivation in the *deposit* condition will exhibit a smaller increase in recycling intentions, in comparison to participants with similar level of intrinsic motivation in the *fine* condition, following an increase in the magnitude of the monetary incentive

Environmental Earmarking

An important insight from both the framing and crowding out literature is that words matter. Our research design sought to examine to what extent "environmental" earmarking – ensuring that the money collected under a deposit/fine framework will

be transferred to a dedicated environmental trust fund²⁰ rather than to a state's general budget – will influence people's attitudes toward the regulatory intervention.

The economic approach to earmarking is contingent, and depends on the structure of the earmarking scheme. In the context of tax payments, there is theoretical support for earmarking when there is close link between the tax payment and the use of the revenues to finance additional expenditures. Such benefit-related earmarking reveals taxpayers preferences for public services and sends a clear message regarding the amount of public service that should be supplied (Bird and Jun 2005: 8). Earmarking is considered inefficient, however, when there is no direct link between those who pay the tax and those who benefit from the expenditure, or in cases in which the level of expenditure is not related to the actual tax revenue (Bird and Jun 2005, : 3). Economists have also analyzed earmarking from a political economy perspective. Earmarking may be used by the government to legitimize a tax increase, even if the new tax is channeled into the general budget and has nothing to do with how much is spent on the earmarked target. In such cases, the earmarking is chimerical. Earmarking can also be motivated by 'rent-seeking' groups, looking to secure portions of the budget to serve their causes (Kimenyi, Lee, and Tollison 1990) (Bird and Jun 2005, : 11-12).

There is, however, relatively little research on the question of how earmarking actually influences the attitudes of people and whether such influence may vary in the context of different regulatory instruments (i.e. deposit vs. fine).²¹ This is an area which calls for systematic empirical analysis. Our study examined two questions.

²⁰ See, e.g., *The Environmental Trust Fund of New Brunswick, Canada*, available at <http://app.infoaa.7700.gnb.ca/gnb/Pub/EServices/ListServiceDetails.asp?ServiceID1=13136&ReportType1=All>.

²¹ For a discussion of earmarking in the context of blood donation, see Mellstrom (2008)..

First, how does earmarking change the perceived fairness of the deposit/fine schemes? Fairness was shown to contribute to the efficacy of the regulatory scheme, through its effect on legitimacy (Raines 2003; Gibson, Caldeira, and Spence 2005; Meares 2000). Second, what are the differences in the expressive influence of earmarking in the context of fines and deposits?

First, the addition of earmarking to the regulatory scheme could moderate the basic aversion to fine noted by McCaffery and Baron (2006), generating a positive effect on the perceived fairness of the fine. Second, by forcing recyclers to collect the deposit (which would otherwise go to the environmental fund), the introduction of earmarking could undermine the ability of recyclers to make a complete contribution to the environment, thus leading to a reduction in the perceived fairness of the deposit scheme. Overall this leads to the following hypothesis:

Hypothesis 3: In response to the earmarking information, the perceived fairness of the fine scheme will increase and the perceived fairness of the deposit scheme will decrease.

Regulation in a Multi-Institutional Context

Exploring the instrument-choice dilemma requires, we believe, sensitivity to the institutional context. One of the hallmarks of modern environmental regulation is the proliferation of private governance schemes, taking place at varied institutional arenas, drawing on non-statal normative sources. The institutionalist approach, on which we draw here, highlights the intricate linkage between individual decision-making and the institutional structure in which this action is embedded, taking the

institutional context as an independent causal variable (Ghoshal and Moran 1995, : 15; Perez, Amichai-Hamburger, and Shterental 2009). We wanted to explore to what extent the institutional setting influences participants' attitudes. We therefore added two additional institutional settings, involving organizations with more than ten employees and academic institutions.

Taking the institutional perspective as a starting point, we focus on two strands of research. First, there is a wide body of literature, starting with the writings of Robert Ellickson and Elinor Ostrom, demonstrating the capacity of close-knit groups to develop highly effective webs of social norms (Vandenbergh 2005; Nee 1998; Ostrom 1999, : 506-507). Most of these studies focus on communities that are not formally organized, from city “blocks” (Ellickson 1998) to Maine lobster fisheries (Ostrom 1999: 528-529). Similar social capabilities, which can support the generation of social norms, may also exist in formal organizations, however (Perez, Amichai-Hamburger, and Shterental 2009; Ariely 2008: 80-83, check). Our study explores one aspect of this question by comparatively examining the self-reported efficacy of recycling norms across different institutional settings. In particular, we wanted to examine how effective are organizational norms in comparison to state norms. We hypothesize that due to the lower scale and greater cohesiveness of organizations in contrast to the state, the fine and ethical code instruments are likely to be more effective in incentivizing recycling behavior in the organizational setting than in the state setting.

Taking seriously the role of organizations as norm-setters (Riles 2008; Locke et al. 2007; Long and Driscoll 2008), our research also explores a second question focusing on the limits of organizational norm-setting in terms of (internal) social legitimacy. In particular, we wanted to examine to what extent organizations can use

forms of legal intervention that tend to be associated with the state (fines and deposits) in a field that lies outside the usual reach of organizational norms. We hypothesized that such intervention could generate resentment by members of the organization (employees and students). This inquiry explores the boundaries of organizational authority (Santos and Eisenhardt 2005), focusing, in particular, on the ways in which such boundaries are reflected in the attitudes of members toward organizational norms. Individuals would be less likely in that context, we argue, to accept controlling measures such as fines and deposits - which are directed to protect public (environmental) resources within the organizational context.

Hypothesis 4A: Participants in the organizational and university sub-samples who were allocated to the fine and ethical code conditions will think that these instruments are more effective in incentivizing recycling behavior in comparison to the parallel condition within the general population sample.

Hypothesis 4B: Participants in the organizational and university sub-samples who were allocated to the fine and deposit conditions will think that these instruments are less desirable in comparison to the parallel condition of the general population.

Summary: Research Questions

Our study focuses on the question of how different regulatory incentives interact with varied compliance motivations. More specifically, it highlights the potential sensitivity of different types of individuals to the framing and magnitude of monetary

incentives and thus the need to take this sensitivity into account in the design of optimal recycling policy. Drawing on the foregoing theoretical apparatus, our paper focuses on the following research questions:

- How does the framing of legally-imposed monetary incentives – focusing on fines and deposits – affect people's attitudes toward the law and their willingness to recycle?
- What is the optimal magnitude of legally-imposed monetary incentives, given the interplay between extrinsic and intrinsic motivation, and its effect on people's overall compliance effort?
- What is the influence of the institutional background on people's attitudes towards different recycling schemes and their willingness to recycle?
- What are the implications of the existence of people with varied levels of intrinsic environmental commitment on the design of optimal recycling policies (given the theoretical considerations noted above)?

3. Method

Participants

The study is based on a panel of 1842 subjects, which was bought from a leading Israeli survey firm.²² The panel is representative of the adult Jewish population in

²² The Israeli survey firm used was Panels, *available at* <http://www.panelsltd.co.il>

Israel.²³ Forty-two subjects were excluded from the research due to their low degree of understanding of the legal setting (n=34) or missing values on most variables (n=8). The final sample, therefore, included 1800 participants - 865 males and 935 females - with a mean age of 37.15 years (SD=14.05 years) and 63.4% reporting completion of higher education (above high school). The data was collected through a web-based survey platform.²⁴

Measures and procedure

The procedure is based on an experimental survey approach, which allows us to compare between various regulatory mechanisms²⁵. Most of the studies undertaken in this tradition are laboratory studies and are usually limited to a single type of regulatory instrument, for example, a reward or a fine (Gneezy and Rustichini 2000; Ariely, Bracha, and Meier 2009). By using an experimental survey methodology, our paper seeks to understand a multi-instrument regulatory environment distinguishing between distinct types of legal incentives.

Before introducing the participants to the manipulation, we evaluated their degree of *environmental commitment* and *willingness to bear personal costs* for recycling. The *environmental commitment* measure was based on a series of questions that attempted to measure people's level of concern to the environment through a

²³ Overall, the sample is only representative with respect to Israel's Jewish population. However, there is some under-representation for elderly individuals with limited internet accessibility. The panel is based on data from the Israeli National Bureau of Statistics, in the preliminary analyses, the background characteristics of the legal instrument sub-groups were compared using analysis of variance for continuous variables and chi-square tests for categorical variables. The different sub-groups did not differ significantly with regard to gender, age, level of education, locality code, locality type, occupational status and religiosity.

²⁴ There has been some critique in the literature with respect to web-based surveys, focusing on their imperfect sampling method and validity. The literature highlights, however, the various advantages of using the internet to conduct surveys in terms of subject-cooperation due to perceptions of social desirability and greater anonymity associated with online survey participation (Reips 2002; Buchanan 2001).

²⁵ The measures were computed in the present study by averaging the grading of the items composing each of them: Environmental Commitment ($\alpha=.75$), Sensitivity to Price/Distance ($\alpha=.66$), and Desirability of the Law ($\alpha=.92$).

series of attitudinal and behavioral questions²⁶. The *willingness to bear costs* is a related measure, which sought to examine the extent to which people's willingness to engage in recycling activity was sensitive to the effort associated with that activity – in our context, measured by the distance one has to walk to the recycling point.²⁷ We used these measures as proxies for the participants' levels of intrinsic commitment to the environment. We examined these two measures in the beginning of the procedure in order to prevent potential influence of the regulatory mechanism on the reported environmental commitment measures.²⁸

In addition, we supplemented the between-subject design with a within-subject design, where participants were asked to revisit their response to certain questions based on new information which was provided to them.

The survey was based on the following hypothetical basic scenario that was presented to all participants. Participants were told that: "... we are conducting a survey which seeks to explore recycling behavior among the Israeli population". They were further told that we would present them with details of the proposed law and would thank them if they agree to answer some questions in this regard. The new laws targeted family size plastic bottles (1.5 L) which are exempted from current recycling regulation under Israeli law.

The main methodology of this study is based on a between-subject design, distinguishing between three regulatory techniques used to encourage recycling

²⁶ The items composing the measures included in this study are presented in the technical appendix (on file with authors).

²⁷ Taken together, these measures offer a rich account of people's attitude towards the environment. This account is more reliable, we believe, than some of the measures found in the literature. Thus, for example, Viscusi et al measured this variable merely by asking participants whether they consider themselves to be environmentalists (Viscusi, Huber, and Bell 2010).

²⁸ We suspected that the higher fines (deposit) and ethical code scenarios could affect people's responses to these questions which could have jeopardized our ability to consider the intrinsic commitment measures as independent variables.

activity: deposit, fine, and ethical code (an additional control group read a scenario which didn't involve a description of the law).

In addition to manipulating the regulatory instrument, two other manipulations were used to refine the instrument choice study. The first dimension referred to the size of the monetary mechanisms (high and low fine and deposit). The second dimension referred to institutional source and context of the regulatory mechanism.

Below is a more detailed description of the three regulatory models that were introduced to the participants as possible “new laws” for encouraging recycling.²⁹

1. **Deposit:** This law imposed a mandatory deposit on 1.5 L plastic bottles. The consumer could get the deposit money back by returning the bottles to recycling points located in various business outlets, such as supermarkets and grocery stores. The deposit was framed as either *high* (1 NIS) or *low* (0.25 NIS or 25 Agorot)³⁰ (*High Deposit* and *Low Deposit* respectively).
2. **Fine:** The second model of regulatory intervention was based on the imposition of a fine on the dumping of 1.5 L bottles into regular waste bins. "The new law will require citizens to separate 1.5 L plastic from the rest of their household waste and throw them into separate recycling containers. According to the law, the number of recycling containers will be increased in order to improve their accessibility. Special inspectors from the environmental protection ministry will have the authority to impose a fine of 250/1000 NIS on citizens who fail to comply with this requirement. Based on past experience, it is estimated that the likelihood of detection is 1 per 1000

²⁹ The complete set of scenarios is described in the technical appendix, on file with authors.

³⁰ One U.S. dollar is equivalent to 3.5-4.0 NIS (New Israeli Shekel) approximately. An Israeli agora is a coin or small change like the U.S. cent.

cases.”³¹ The fine was framed as either *high* (1000 NIS) or *low* (250 NIS) (*High Fine* and *Low Fine* respectively). Given the probability of detection, (1/1000) the *expected value* of the fine was identical to the deposit (1 or 0.25 NIS).

3. **Ethical Code:** The third generic model was based on an environmental ethical code. The description of this instrument was as follows: "Recently, some leading Israeli environmental NGOs³² have published an environmental ethical code seeking to encourage recycling. The code states, among other things, that: ‘1.5 L plastic bottles ought to be recycled, using separate recycling containers which are located in the streets’. Based on the code, the environmental NGOs have collaborated with local municipalities and the Ministry of the Environment to increase the number of recycling containers in order to improve their accessibility.” Unlike the foregoing two models, this instrument does not use monetary incentives (hereinafter: *Ethical Code*).
4. **Control Group:** Finally, participants in the control group were not presented with any legal instrument (hereinafter: *Control Group*). Right after measuring their level of environmental commitment and willingness to bear costs, participants in the control group answered questions regarding their social appraisal of recycling behavior (as described in detail in the Measures section below),

Source and Context of the Law

The description above reflects six different sub-groups (high deposit, low deposit, high fine, low fine, ethical code, and control group). A common feature of the

³¹ The containers are located in the streets. The system described in the questionnaires is based on the current Israeli recycling structure, which is not based on curbside collection.

³² The Hebrew text included the names of three leading Israeli environmental NGOs

four fine/deposit conditions was the assumption that the source of the legal instrument was the state, in its role as the ultimate societal norm-setter. Given the increasing importance of non-state sources in the governance game, however, we wanted to examine the influence of this variable as well. Therefore, we added an additional variable reflecting the possibility that the source of the law would be an organization. We distinguished between two distinct organizational contexts: an organization (workplace) and a university (with two different target populations: employees and students). Within each institutional context, we presented the participants with three different instruments: *High Deposit*, *High Fine*, and *Ethical Code*.

In the context of the organization (workplace) we used the following text to introduce the legal instrument: "The management of the organization in which you are employed considers the possibility of adopting a policy that will encourage recycling. The decision determines that a deposit of 1 NIS will be imposed on every bottle sold in the organization's cafeteria. This deposit will be returned to the employee upon returning the bottle back to a recycling point which is located in the workplace." In addition to the high deposit mechanism, the 'workplace' vignettes included two additional scenarios: high fine and ethical code (using a similar text). These three scenarios will be called: *deposit-org*, *fine-org*, and *ethical-org*.³³

In the university context, we used a similar text: "The management of the academic institution in which you study considers the possibility of adopting a policy that will encourage recycling within the campus. The decision determines that a deposit of 1 NIS will be imposed on every bottle sold in the campus' cafeterias. This deposit will be returned to the student upon returning the bottle back to recycling points which are located around the campus." In addition to the high deposit

³³ It should be noted that in the part of the paper when the sources of the law was examined, the laws presented by the state were presented with the suffix of "Gov".

mechanism, the “university” vignettes included two additional scenarios: high fine and ethical code (using a similar text). These three scenarios will be: *deposit-edu*, *fine-edu*, and *ethical-edu*.

Overall, the different manipulations described above have generated 12 sub-groups (conditions).³⁴ To ensure the randomness of the sub-groups’ composition, each of the participants had an equal chance of being allocated into each of the sub-groups.³⁵ In addition, we have confirmed that no significant differences were found with regard to the main demographic factors.³⁶

Following the scenario, participants were presented with a series of questions regarding their attitudes toward the “new law”, their views on the act of recycling from several perspectives, and their perception of its efficacy. Based on theoretical considerations and in accordance with statistical testing of the fitness of the scale, the items were aggregated to scales which served as the study’s main dependent variables.

We first examined the extent to which people thought that the legal mechanism presented to them should be adopted by the state (or the organization/academic institution).³⁷ This variable was termed *the desirability of the law*. The next factor focused on the perceived effect of the proposed legal framework on the level of recycling. This factor divided the (projected) effect of the targeted instrument on the behavior of others (here and after: “*general efficacy*”) and the (projected) effect on

³⁴ Control group (n=150); Low Deposit (n=149); High Deposit (n=149); Low Monetary Fine (n=146); High Monetary Fine (n=148); Ethical Code (n=146), Workers-Deposit (n=146); Students-Deposit (n=145), Workers-Fine (n=138), Students-Fine (n=141), Workers-Ethical Code (n=169), Students-Ethical Code (n=173).

³⁵ We also controlled the composition of the organizational and university sub-groups, allowing only employees and students to proceed with answering the respective questionnaires.

³⁶ See footnote 24 for details.

³⁷ We also had a prior factor, which measured people’s level of understanding of the legal mechanism, and was used to exclude from the sample participants who had a very low degree of understanding.

one's own recycling practices (here and after: "*personal efficacy*"). Finally, we presented people with a series of questions focusing on the influence of the law on their level of *social appraisal* of recycling behavior. *Social appraisal* of recycling behavior was measured by three items: first, evaluation of recycling behavior in general (to what extent they consider recycling a worthy practice); second, a concrete-evaluation: how would they consider (or appreciate) an individual undertaking recycling action; third, the willingness of the participant to make a critical comment to a neighbor (or work- colleague, student) that "breaches" the recycling norm.

In addition, we introduced to the participants the possibility of earmarking the collected money (in the context of the eight deposit/fine scenarios) to a special environmental fund and examined the effect of this new data on participants' evaluation of the legal instrument. In particular, we examined to what extent such earmarking would influence people's perception of the *fairness* of the legal scheme. Finally, various demographic factors (such as gender, age, income, and level of education) were measured and accounted for.

4. Findings

General Observations

Our first series of analysis of variance³⁸ examined the way in which different legal frameworks affected people's attitudes towards the law in terms of its desirability,

³⁸ The degree of legal understanding was controlled for in each of the analyses. Since the legal instrument sub-groups did not significantly differ with regard to background variables (see footnote 24), demographics and other background measures were not controlled for in most of the analyses (unless stated otherwise).

general and personal efficacy and social appraisal.³⁹ In the first stage, we focused on five legal settings: *High Deposit*, *Low Deposit*, *High Fine*, *Low Fine*, and *Ethical Code*⁴⁰. First, we looked into the way in which the different legal instruments affected participants' view of the desirability of each legal instrument. We found that the two deposit instruments (High and Low) as well as the Ethical Code scheme were perceived as more desirable than the two fine schemes (High and Low).⁴¹ In the second stage, we considered the question of efficacy. In that regard, only the high deposit condition was found to be significantly different from the ethical code condition in terms of general efficacy (effect on others).⁴² Unlike general efficacy, personal efficacy did not differ between the conditions.⁴³ Finally, we considered the issue of social appraisal.⁴⁴ We found a complex effect of the instruments' variance on the social appraisal factor.⁴⁵ Specifically, participants in the control and ethical code

³⁹ We used a series of one-way analyses of covariance (ANCOVAs or multivariate analyses of covariance for multiple subscales) to examine the effect of the type of legal instrument on the outcome variables, followed by a Bonferroni post-hoc analysis.

⁴⁰ As mentioned in the Method section, participants in the control group did not answer questions regarding the desirability and efficacy of the instrument. Therefore, the control group was included only in analyses regarding the social appraisal items.

⁴¹ An analysis of variance confirmed that the different sub-groups significantly differed: $F(4,732)=8.15, p<.001, \eta^2=.04$. The Low Deposit condition was ranked highest with regard to desirability, followed by Ethical Code, High Deposit, Low Fine and High Fine. Post-hoc analyses revealed significant differences between the *Ethical Code* and both *Deposit* conditions on the one hand, and both *Fine* conditions on the other hand.

⁴² We asked the respondents to what extent did they think that the described law was expected to increase the level of recycling at the state level. An analysis of variance indicated that the distinct sub-groups significantly differed on the measures of efficacy. *Multivariate* $F(8, 1460) = 2.16, p<.05, \eta^2=.01$. The following Univariate tests indicated that the effect was marginally significant only for the effect on others. Effect on others: $F(4,731)=2.13, p=.08, \eta^2=.01$; Effect on self: $F(4,731)=1.60, p>.1, \eta^2=.01$.

⁴³ The *High Deposit* condition was ranked highest with regard to general efficacy, followed by *Low Deposit*, *High Fine*, *Low Fine* and *Ethical Code*. Post-hoc analyses revealed significant differences between the *High Deposit* and the *Ethical Code* conditions.

⁴⁴ Since participants of the Control Group were not asked about the understanding of the legal setting, missing values on this variable were replaced by the total mean score of the sub-groups included in the analyses.

⁴⁵ The analysis of variance revealed that, overall, the legal instrument sub-groups significantly differed on the variables of *social appraisal*. *Multivariate* $F(15,2421)=4.61, p<.001, \eta^2=.03$. The effect was significant for all of the tested variables. Evaluation of the action $F(5,879)=3.46, p<.01, \eta^2=.02$; Appreciation of others $F(5,879)=3.54, p<.01, \eta^2=.02$; Commenting to others $F(5,879)=4.70, p<.001, \eta^2=.03$.

conditions had higher appreciation of both recycling and of people who recycle, in comparison to the fine and deposit conditions. Interestingly, while participants in the control condition had the highest appreciation for recycling and recyclers, they had the lowest willingness to comment to others who do not recycle, relative to other conditions.⁴⁶

The Interplay between People's Intrinsic Motivation and the Choice of Legal Instrument

The existence of individuals with varied levels of intrinsic environmental motivation among the regulated community could yield significant differences in the way in which people react to different legal instruments. In order to capture people's level of intrinsic environmental motivation, as described in the method section, we used two measures: environmental commitment and willingness to bear costs as part of recycling effort. While the first measure sought to capture people's attitude towards the environment by considering their concern for the environment and by analyzing the extent to which they engage in pro-environmental behavior, the second measure sought to elicit people's preferences by looking at their sensitivity to the distance between their house and the recycling bin. The association between level of

⁴⁶ With regard to evaluation of recycling, the *Control* condition was ranked highest, followed by *Ethical Code*, *High Deposit*, *Low Fine*, *Low Deposit* and *High Fine*. Post-hoc analyses revealed significant differences between the *Control* and *Ethical Code* conditions on the one hand and the *High Fine* condition on the other hand. The *Control* condition was also ranked highest with regard to appreciation of people who recycle, followed by *Ethical Code*, *High Fine*, *Low Deposit*, *High Deposit* and *Low Fine*. Significant differences emerged between the *Control* condition and the *Low Deposit*, *High Fine* and *Low Fine* conditions, as well as between the *Ethical Code* condition and the *Low Deposit* condition (some of the results were only approaching significance). With regard to willingness to comment to others, *High Fine* was ranked highest, followed by *High Deposit*, *Ethical Code*, *Low Deposit*, *Low Fine*, and the *Control* condition. The *Control* condition had significantly lower ranks than each of the other conditions.

environmental commitment and the costs (reflected in time-lost) people are willing to bear for recycling is explored in the literature on recycling norms (Carlson 2001; Hansmann et al. 2006). Indeed, we found that the two measures were closely correlated, with stronger environmental commitment mirrored by greater willingness to incur costs in the recycling process⁴⁷. To avoid repetition, we report our findings drawing only on the factor of willingness to incur costs. People with high willingness to incur costs (low sensitivity to distance) will be referred to as people with *high intrinsic motivation*; people with low willingness to incur costs (high sensitivity to distance) will be referred to as people with *low intrinsic motivation*.

As expected⁴⁸, we found that across all conditions, people with higher levels of intrinsic motivation considered the new recycling instrument more desirable (relative to the low intrinsic motivation group).⁴⁹ There was also a significant interaction between the type of the legal instrument to which the respondents were exposed and their level of intrinsic environmental motivation. The two-way ANCOVA revealed that the effect of the legal instrument on the measure of the desirability of the law *changed* according to the level of intrinsic environmental motivation.⁵⁰ In particular, only among participants with low intrinsic motivation⁵¹ did the legal instrument have a significant effect on the measure of desirability,⁵² with

⁴⁷ $r = 0.43, p < 0.001$

⁴⁸ A series of two-way analyses of covariance (ANCOVAs or multivariate analyses of covariance for multiple subscales) was used to test for interactions between the legal instrument and the sensitivity to price/distance.

⁴⁹ Low sensitivity to distance: $M = 54.70, SD = 18.65$; High sensitivity to distance: $M = 49.72, SD = 19.32, F(1, 727) = 15.39, p < .001, \eta^2 = .02$.

⁵⁰ Participants were divided into two sub-groups according to the median value of the sensitivity to price/distance measure (median = 49.25). This median value was calculated among the sub-groups included in this analysis.

⁵¹ Among participants with *high intrinsic motivation*, the legal instrument did not have a significant effect on the measure of the desirability of the law ($p > .05$).

⁵² These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

both deposit scenarios generating higher desirability than the two fine scenarios.⁵³ The desirability of the legal instruments as a function of intrinsic motivation and the legal instrument is presented in Figure 1.

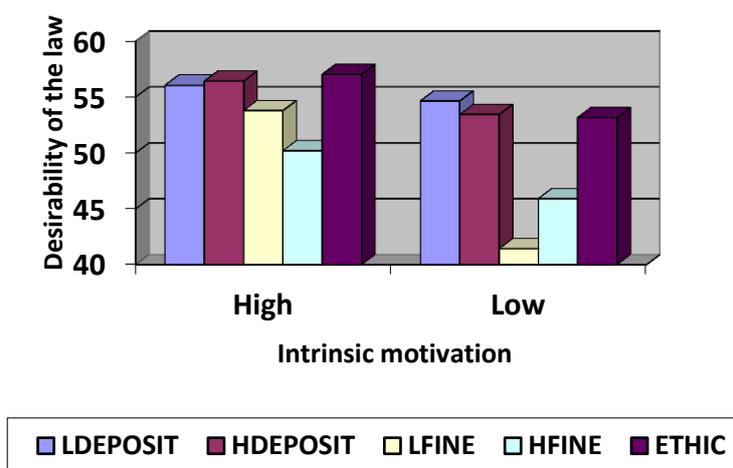


Figure 1. The adjusted means scores for the desirability of the law as a function of the legal instrument and of intrinsic motivation (n=738).

This result suggests that participants with *low* intrinsic motivation exhibited higher resentment to fines compared to participants with *high* intrinsic motivation; the latter having demonstrated relative indifference to variance in the legal mechanisms. Even more surprising is the preference of the *High Deposit* regime over the *Low Fine* regime among the low intrinsic group, even though the former is less attractive in terms of its expected utility.

Intrinsic Motivation and the Effect of the Different Regulatory Instruments

⁵³ $F(4,727)=8.03, p<.001, \eta^2=.04$.

The pairwise comparison between *High Deposit* and *High Fine* was marginally significant, $p=.066$ two tailed. In addition, the *Ethical Code* scenario generated a significantly higher desirability of the law than did the *Low Fine*.

Drawing on analysis of variance, we found a significant interaction between the level of intrinsic motivation,⁵⁴ the type of the instrument and recycling intentions.⁵⁵ Overall, the effect of the legal instrument on the measures of efficacy *changed* according to the level of intrinsic motivation. Univariate tests revealed that the interaction was significant only for *the perceived efficacy of the law at the individual level*⁵⁶. Among participants with *high intrinsic motivation*, the *Low Fine* instrument generated a higher effect relative to the *High Deposit*, *High Fine*, and *Low Deposit* instruments. *Ethical Code* was ranked second to the *Low Fine*.⁵⁷ By contrast, among participants with low intrinsic motivation, the *High Deposit* instrument generated a higher perceived effect in comparison to the *Ethical Code*, *Low Fine*, and *Low Deposit* scenarios. *High Fine* was ranked second to *High Deposit*.⁵⁸

⁵⁴ As could be seen from the graph, the effect of all the measures was positive, that is all participants reported that the regulatory measure will increase their level of self-recycling. The differences were in the level of the increase.

⁵⁵ *Multivariate F* (8, 1450) = 3.42, $p < .001$, $\eta^2 = .02$.

⁵⁶ Personal Efficacy - $F(4,726) = 6.27$, $p < .001$, $\eta^2 = .03$; General Efficacy - $F(4,726) = 1.29$, $p > .05$, $\eta^2 = .01$.

⁵⁷ $F(4,726) = 3.56$, $p < .01$, $\eta^2 = .02$.

⁵⁸ $F(4,726) = 4.48$, $p < .001$, $\eta^2 = .02$.

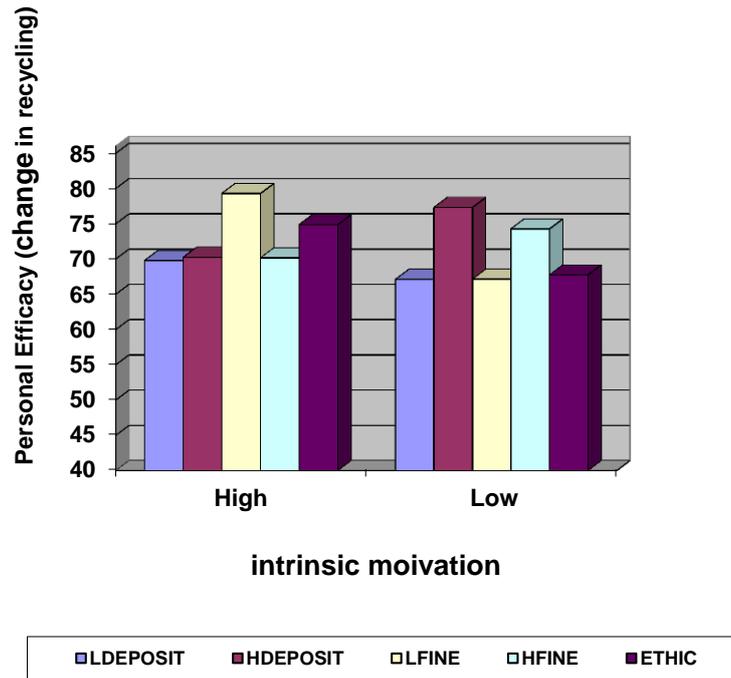


Figure 2. The adjusted means scores for the personal efficacy of the law as a function of the legal instrument and of intrinsic motivation (n=737).

The interplay between Intrinsic Motivation, Type of Instrument, and Level of Incentive, in determining Personal Efficacy

We found that the interplay between the level of incentive and intrinsic motivation, in predicting the behavioral effect of regulatory interventions, was different under conditions of Fine and Deposit (Consistent with Hypothesis 2B(1). We found a significant interaction effect between the size of the fine and the level of intrinsic motivation.⁵⁹ The effect of the magnitude of the fine was reversed with regard to highly motivated individuals. Within the high intrinsic motivation sub-group, *Low Fine* generated a greater effect on the measure of personal-efficacy when compared to

⁵⁹ $F(1,288)=12.73, p<.001, \eta^2=.042.$

High Fine.⁶⁰ In contrast, within the low intrinsic motivation sub-group, *High Fine* generated a greater effect than *Low Fine*.⁶¹

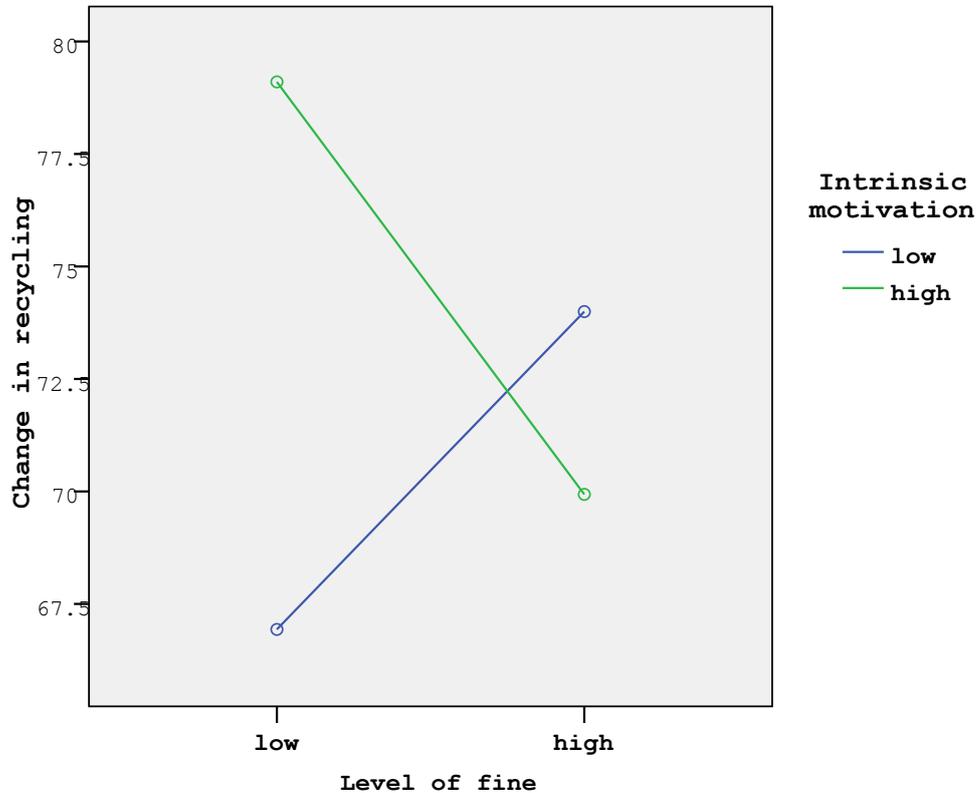


Figure 3: The effect of the law on the level of change in personal recycling as a function of intrinsic motivation and the magnitude of the monetary incentive (fine).

As can be seen from the graph above, we found an interesting interaction between the measure of intrinsic motivation and the (reported) behavioral effect of the monetary incentive on levels of personal recycling. Within the class of people with high intrinsic motivation, the behavioral effect of the fine decreased as we raised the fine. In contrast, within the class of people with low intrinsic motivation the behavioral effect of the fine increased as the level of the fine increased.

We got different results, however, when we examined the interaction effect between the amount of the deposit and level of intrinsic motivation, reflecting a

⁶⁰ $F(1,288)=7.87, p<.01, \eta^2=.027$.

⁶¹ $F(1,288)=4.94, p<.05, \eta^2=.017$.

framing effect.⁶² Within the low intrinsic motivation class, the pattern of results was similar to the *Fine* context: the behavioral effect of the deposit increased as the level of the deposit increased.⁶³ However, within the high intrinsic motivation group, raising the magnitude of deposit was not significantly associated with behavioral effect (as illustrated in Figure 4).

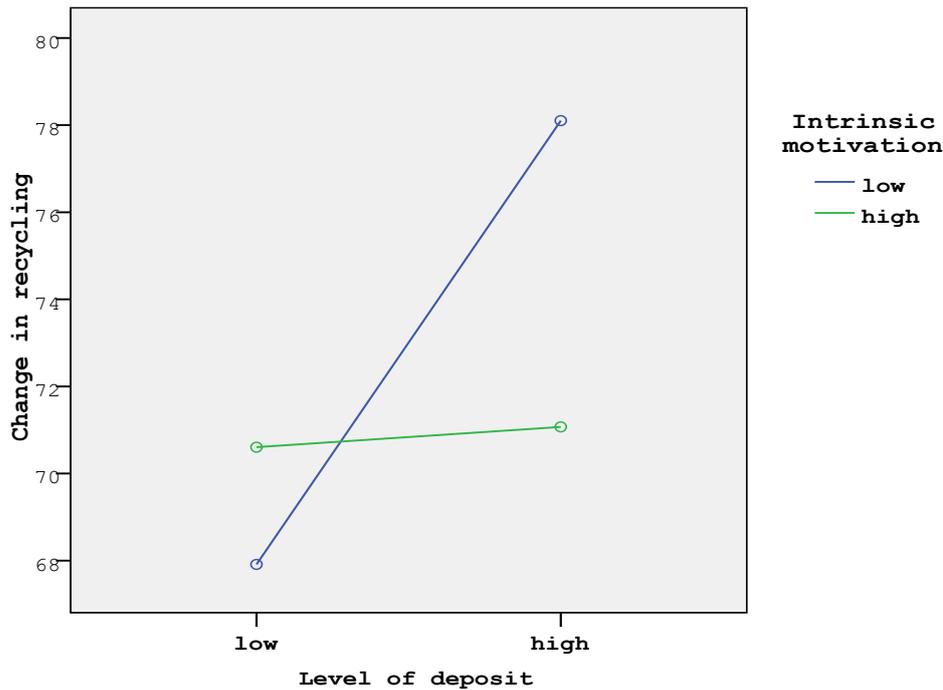


Figure 4. The effect of the law on the level of change in personal recycling as a function of intrinsic motivation and the magnitude of the monetary incentive (deposit).

The Expressive Effect of Green Earmarking

As explained in the method section, we exposed the respondents in all the deposit/fine sub-groups (across all the institutional dimensions) to the possibility that the funds collected under the deposit or fine schemes would be transferred to an environmental

⁶² $F(1,293)=4.19, p<.05, \eta^2=.014$.

⁶³ $F(1,293)=8.34, p<.01, \eta^2=.028$

fund that invests in pro-environmental projects. We examined, to what extent, this data has changed people's perception of the *fairness* of the regulatory scheme by comparing participants' perceptions in all the fine and deposit conditions before and after they were told about the environmental fund.⁶⁴ We found a significant interaction effect between the earmarking and the legal instrument.⁶⁵ Whereas, in the *ex ante* case (before the earmarking was announced), the deposit instruments were ranked higher, in terms of their fairness, than the fine instruments⁶⁶, in the *ex post* case (after the announcement) a reverse pattern was found according to which the deposit instruments were ranked lower, in terms of their fairness, than the fine instruments⁶⁷. While “coloring” the money positively influenced the perceived fairness of the fine instruments (both high and low), it had a reverse effect within the deposit instruments (both high and low). This interaction effect is illustrated in Figure 5 below.

⁶⁴ We conducted a two-way MANCOVA 2 (timing) X 2 (legal instrument), with repeated measures for timing (timing refers to the distinction between the evaluation before and after the exposure to the earmarking) comparing all the deposit groups (low deposit, high deposit, deposit workers, deposit students) against all the fine groups (low fine, high fine, fine workers, fine students).

⁶⁵ $F(1,1156)=128.94, p<.001, \eta^2=.10$.

⁶⁶ $F(1,1156)=50.20, p<.001, \eta^2=.04$ (based on the linearly independent pair-wise comparisons among the estimated marginal means).

⁶⁷ $F(1,1156)=22.31, p<.001, \eta^2=.02$.

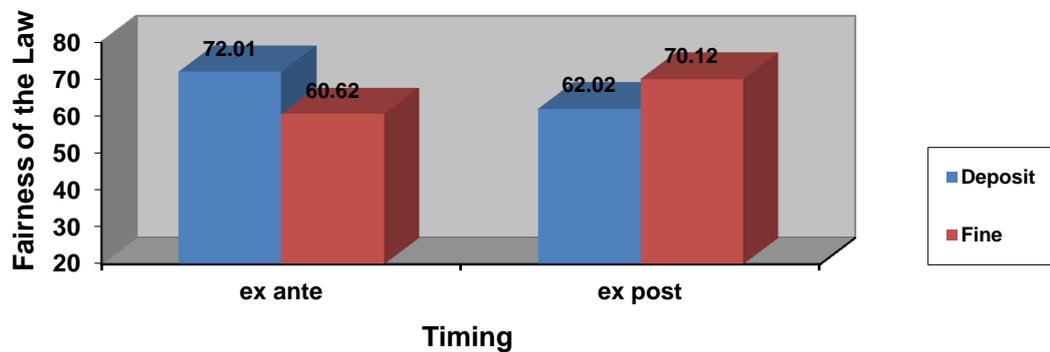


Figure 5: Estimated means of fairness as a function of earmarking (*ex ante* vs. *ex post*) and the legal instrument within the entire sample (n=1159).

Regulation in a Multi-Institutional Environment

We conducted a comparative institutional study of desirability and efficacy of the different legal instruments. To this aim, a series of analyses of variance examined whether the desirability and efficacy of the legal instrument (*High-fine*, *High-deposit*, or *Ethical Code*), changed according to the institutional source of the legal norm (state, organization, academic institution).

These analyses yielded two key findings. First, with respect to the desirability of the law, we found no indication of extended resentment to fines and deposits within private organizations⁶⁸. We found a significant main effect for the legal instrument across the three institutional settings: state (Gov.), organization (Org.), and academic institution (Edu.).⁶⁹ The *Ethical Code* was perceived as more desirable than the *Deposit* scheme, which in turn was perceived as more desirable than the *Fine* scheme.

⁶⁸ A two-way Ancova for the desirability of the law was used, in order to test the interaction between legal instrument and institutional source of the law (instrument and institution were inserted as independent factors).

⁶⁹ $F(8,1344)=29.78$, $p<.001$, $\eta^2=.17$. The addition of the covariate's age, level of education, and level of income revealed a similar pattern of results, $F(8,1099)=25.07$, $p<.001$, $\eta^2=.15$. The two-way ANCOVA revealed that the main effect of the source of the legal norm on the measure of the desirability of the law was not significant. The addition of the covariate's age, level of education, and level of income revealed a similar pattern of results.

The interaction effect between the source of the legal norm and the legal instrument was not significant, indicating that the effect of the legal instrument on the measure of the desirability of the law did not change according to the source of the legal norm.⁷⁰

Second, with respect to general efficacy, our findings indicate that organizational norms were perceived as being more effective on others⁷¹ in the context of *Fines* and *Ethical Code*, but not in the context of *Deposits*. The *Ethical Code* and *Fine* schemes were perceived therefore as having more effect on others within the private institutional setting, in comparison to the state setting. The MANCOVA⁷² indicated that overall, the legal instrument differed significantly on the measures of the efficacy of the law.⁷³ Based on the Bonferroni post-hoc test, we found that all of the academic institution, organizational scenarios and state deposit scenarios generated a significantly higher efficacy of the law than did the state ethical scenario. In addition, the organizational fine scenario generated a significantly higher efficacy of the law than did the state fine scenario.

5. Discussion

⁷⁰ $F(4, 1344) = 1.65, p > .05, \eta^2 = .01$. The addition of the covariate's age, level of education, and level of income did not change the pattern of results. $F(4, 1099) = 1.42, p > .05, \eta^2 = .01$. Testing the legal instrument effect within each of the institutional settings separately, revealed a similar pattern of results. State: $F(2, 1344) = 26.90, p < .001, \eta^2 = .04$; Academic Institution: $F(2, 1344) = 36.79, p < .001, \eta^2 = .05$; Organization: $F(2, 1344) = 55.88, p < .001, \eta^2 = .08$.

⁷¹ It should be noted that when we measured the effect of the different instruments on the personal level, we found no variation between the institutional sources.

⁷² We conducted a Mancova test for personal and general efficacy, in which the 9 institution X legal instrument conditions were united into one factor termed "legal instrument".

⁷³ *Multivariate* $F(16, 2684) = 3.10, p < .001, \eta^2 = .02$. The addition of the covariate's age, level of education, and level of income revealed a similar pattern of results. *Multivariate* $F(16, 2196) = 2.95, p < .001, \eta^2 = .02$. Univariate tests revealed that the effect was significant only for the effect of the law on others. General Population level $F(8, 1343) = 4.74, p < .001, \eta^2 = .003$; Personal level $F(8, 1343) = .83, p > .05, \eta^2 = .0$

Our findings highlight the complex interplay between external regulatory incentives and intrinsic environmental motivation. This complexity challenges the traditional "one-size-fits-all" model of regulation and highlights the potential advantage of differentiated regulatory structures.

With respect to the general differences between the *Tax* and *Deposit* schemes, we found that the *Deposit* scheme was not only perceived as more desirable but was also seen as more effective in terms of its effect on others.⁷⁴ Our findings also demonstrate a complex effect of the law on the moral perception of recycling. While the existence of legal intervention made it easier for people to comment to others who didn't engage in recycling, it reduced their appreciation of those who do recycle (in comparison to the control group). In other words, turning recycling into law undermined the approbatory value of recycling. Legal intervention in the recycling domain could therefore have a contradictory effect: it seems to have a positive regulatory effect on the class of non-recyclers (who are more likely to be rebuked when recycling is turned into law) and a negative expressive effect on those who do plan to recycle (who are likely to receive less commendation under the same circumstances). This uneven effect echoes our general argument regarding the significance of differentiated regulation.

Intrinsic Motivation and the Choice of Legal Instrument

Our findings also demonstrate the importance of the level of intrinsic motivation to the perception of different regulatory instruments. Our key finding in that regard was

⁷⁴ With regard to general efficacy, as was shown in the results section, only the high deposit condition was found to be significantly different from the ethical code condition.

a significant interaction between the *type* of the legal instrument to which the respondents were exposed and their *level of intrinsic environmental motivation*. The introduction of a legal instrument only had a significant effect on the measure of the desirability of the law for participants with low intrinsic environmental motivation where the *High/Low Deposit* instruments generated higher desirability than the two fine instruments. Participants with low intrinsic environmental motivation demonstrated, therefore, higher resentment to fines in comparison to those with high motivation. Even more surprising is their preference of the *High Deposit* instrument over the *Low Fine* instruments, even though the former seems less attractive in terms of individual expected utility. A possible explanation for this puzzle may lie in people's inability to understand the true monetary difference between two instruments due to framing and probability neglect (McCaffery and Baron 2006; Sunstein 2002). Contrary to the foregoing finding, highly committed individuals demonstrated indifference to variance in the legal arrangements. This finding may suggest that aversion to fines is contingent upon individual intrinsic moral sentiments.

We also found an interaction between the choice of instruments, the strength of intrinsic motivation, and the perceived efficacy of the varied instruments. Among participants with high intrinsic environmental motivation, the *Low Fine* scenario generated a higher perceived (personal) efficacy of the law than did the *High Deposit*, *High Fine*, and *Low Deposit* scenarios. *Ethical Code* was ranked second to the *Low Fine* scenario. By contrast, among participants with a low intrinsic environmental motivation, the *High Deposit* scenario generated a higher perceived (personal) efficacy than did the *Ethical Code*, *Low Fine* and *Low Deposit* scenarios. *High Fine* was ranked second to the *High Deposit*. These differences in the effect of the larger

monetary incentives confirm our prediction regarding crowding out and the importance of accounting for intrinsic motivation.

An interesting question is why did individuals with high intrinsic motivation react more strongly to *Low Fine* than to *Ethical Code*? One explanation is that the fine regime provided some assurance to the highly motivated group that they would not be exploited by free-riders. The second puzzle relates to the greater efficacy of *Low Fine* over *High Fine*, as the 'free-riding' argument suggests the reverse order. One possible answer is the concept of a token of appreciation that monetary incentives of a certain magnitude can signal. According to Frey (1999) U-shape hypothesis, the crowding out effect will have its strongest “bite” at some intermediate level.⁷⁵ It is possible that our *Low Fine* manipulation has triggered a similar effect to the low tax condition reported in Frey's paper. Our *High Fine* condition has triggered the greatest reduction in motivation, similar to Frey's intermediate level of tax.

In line with our initial prediction, we found that the crowding out effect was influenced by framing. That is, while we found an anti-synergetic effect between the extrinsic monetary incentive and the intrinsic motivation in both the fine and deposit conditions, this effect was much stronger within the fine context. While in the fine context raising the fine within the high intrinsic motivation group was associated with reduced effect, raising the deposit led to no significant behavioral effect. In contrast, the effect of raising the economic incentive within the low intrinsic motivation group was in line with economic theory (raising the size led to increase in recycling intentions).

Earmarking

⁷⁵ See, Thøgersen (1994) for some empirical support (in the context of small differentiated garbage fees).

Examining the effects of environmental earmarking also revealed interesting differences among the legal instruments. While “coloring” the money positively influenced the perceived fairness of the fine instrument (both high and low), it had a reverse effect within the deposit instruments (both high and low). Furthermore, while *ex ante* the deposit instruments were perceived as fairer than the fine instruments, *ex post* the fine instruments were seen as more fair.

The positive effect in the context of the fine can be explained with the assumption that the addition of earmarking to the regulatory scheme moderates the basic aversion to a fine creating a rebound effect. The negative effect we found in the case of deposits reflects the way in which earmarking diffuses the distinction between good and bad behavior. The difference we found between deposits and fines reflects the probabilistic nature of fines. In the case of deposits an individual making a decision to return bottles for recycling knows with certainty that she will get paid – with money that would otherwise go to the environmental fund. In contrast, in the context of fines, there is no such effect because non-recycling is only probabilistically related to the fine (and therefore there is no parallel perception of preventing money from being transferred to the environmental fund). This difference undermines the ability of people to make a complete contribution to the environment through the deposit scheme, and reduces its perceived fairness. An alternative explanation may be that the earmarking highlights the immoral aspect of non-recycling - bringing forth the negative externalities associated with it - which is masked by the neutral term “deposit.” This moral uneasiness may be projected onto the “fairness” factor.

An interesting policy question that we wish to explore in future research is whether the negative effect of earmarking in the case of deposits could have been

countered by allowing recyclers to waive their right to get the deposit? There are some indications in the literature that this may be the case. Mellstrom and Johannesson make a similar argument in the case of blood (2008). In that context, they argue that blood donation is partially driven by people's attempt to signal their altruism to others and that paying a donor reduces the effect of a contribution as a signal, so payments to contributors may reduce contributions from those who were willing to do it for free. In their blood donation experiment, they show that while payments sometimes deter donations,⁷⁶ offering subjects the opportunity to donate their payments to charity fully counteracts the deterrent effect of payments.

Comparative Institutional Analysis

The comparative institutional analysis includes several findings with respect to the capacity of private organizations to act as sources of governance. These findings are particularly important given the increasing role of civic society and private organizations in the regulatory realm. First, we found no evidence of resentment to fines and deposits within organizations. This finding was particularly surprising with respect to fines, which are more intrusive than deposits. Second, we found that the *Ethical Code* and *Fine* instruments were perceived as having a stronger effect on others within the private institutional setting, in comparison to the state setting. In the case of the *Fine* scheme, it may reflect the attribution of increased enforcement and monitoring capacities to organizations. In the case of the *Ethical Code* scheme, it may reflect the fact that within relatively small social environments voluntary codes may have more effect, due to the possibility of increased social (peer) pressure (both

⁷⁶ Interestingly, they find a significant crowding out effect for women only.

negative – social sanctions and positive – peer praise), higher visibility of anti-environmental behaviour and organizational loyalty (Ela 2009).

Limitations

First, there are certain intrinsic limitations to the methodology used in this study. Measured items were self-reported attitude scales. Given the extensive literature on the complexity of the attitude-behavior relationship (Feldman 2007), we must be careful in interpreting these findings, especially given the fact that recycling is a costly behavior. We cannot dismiss the possibility that participants may have engaged in “cheap talk” in their reports on intention to recycle.

Nonetheless, numerous studies have documented the validity of using attitudes as a proxy for behavior (Ajzen 1991). Furthermore, the focus of experimental surveys does not lie in the absolute numeric results they produce, but rather in the way in which they allow the researcher to differentiate between sub-groups that were randomly assigned to the distinct settings. Third, while intention to behave is indeed a controversial measure, measures of perceived fairness and social desirability are widely recognized in the literature as important both theoretically and practically (Tyler 2006; Carlsmith, Darley, and Robinson 2002). Clearly, future research drawing on field and lab-based methods could further our understanding of the phenomena described in this article.

6. Conclusions and Policy Implications

According to our findings *Deposit* schemes are perceived as both more desirable and more effective. This finding gives further justification for using deposits as part of a

regulatory initiative aimed at encouraging recycling.⁷⁷ Second, accounting for the interplay between intrinsic and extrinsic motivation requires giving greater focus to the distribution of motivations among the community targeted by the regulatory scheme. The conventional view of a "one-size-fits-all" model of regulation may not be suitable for the regulation of highly heterogeneous communities. Instead, we argue that it brings to the fore a different regulatory paradigm – “differentiated regulation” - which aspires to match the regulatory strategy to different types of individuals. Replacing the assumption of uniformity with one of heterogeneity is therefore critical for the design of optimal social policies.

The foregoing observation has two implications for policy-making. First, designing a uniform environmental policy (recycling or any other policy involving household externalities) requires an understanding of the distribution of types within the population, which would allow the policy maker to compare the possible crowding out effect of intrusive intervention with the diminishing returns of under-incentivizing. Disregarding this potential effect could undermine the effect of regulatory intervention.⁷⁸ The second implication highlights the potential role of differentiated regulation. In the recycling field, we see broad potential for such strategy by giving municipalities broad leeway in designing their recycling strategies and the exact choice of instruments. While the government can set broad recycling goals, it should leave the power to municipalities to determine the exact structure of the regulatory framework. To some extent, we see such a process of “local” empowerment in the environmental field today. Because municipalities differ on their

⁷⁷ Bottle bills or container deposit laws have a long regulatory history and continue to be the subject of debate. For an overview of the current regulatory scene see <http://www.bottlebill.org/>.

⁷⁸ Our study thus offers important refinements to studies such as (Viscusi, Huber, and Bell 2010), which disregards the crowding out effect completely in his theoretical and experimental design and in his policy recommendations.

sociological profile, they could use their autonomy to employ the appropriate type of instrument in their communities. Third, our study also demonstrates the potential importance of private organizations in the encouragement of recycling.

Finally, our comparative institutional analysis highlights the capacity of private organizations to act as sources of governance both by finding a surprising lack of resentment to organizational intervention in national issues such as recycling and by pointing to the higher efficacy of private (organizational) regulation.

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