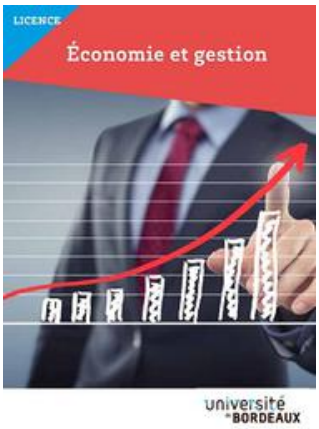

The effectiveness of monetary incentives and deterrents

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Table of contents

Introduction

Psychology is, at its core, the study of the mind and human behaviour. It is an academic discipline and both an applied science and a social science, which strives to examine, understand, and categorise, human thought and behaviour by establishing general, overarching principles, and by analysing specific case studies through the use of the scientific method. Psychologists explore concepts such as perception, cognition, attention, emotion, intelligence, phenomenology, motivation, brain functioning, personality, behaviour, and interpersonal relationships, including psychological resilience, family resilience, and other areas.

Behavioural psychology is one of the many branches that belongs to the science of psychology, it specifically analyses human and animal behaviour. Behavioural psychology tends to focus on responses to stimuli, responses to incentives and deterrents, and the reasons behind these reactions.

Economics is a social science that studies the production, distribution, and consumption of goods and services, or the material welfare of humankind. Economics can generally be broken down into two major disciplines: macroeconomics and microeconomics. Macroeconomics examines economy-wide phenomena such as changes in unemployment, national income, rate of growth, gross domestic product, inflation, and price levels. Microeconomics refers to the branch of economics that analyses the market behaviour of individual consumers and firms in an attempt to understand the decision-making process of firms and households. Thus, it is apparent to see why the science of economics is also regularly defined as fundamentally being the study of human choices, since the field of economics studies, analyses, and attempts to model, how individuals, governments, firms, and nations, make choices on allocating scarce resources to satisfy their unlimited wants and desires.

One of the key principles involved in economic research, thought, and modelling, is the theory of *homo economicus*. In economics, *homo economicus*, which is Latin for economic man, portrays humans as being consistently rational and narrowly self-interested agents who usually pursue their subjectively defined ends optimally. Generally, *homo*

economicus attempts to maximize utility as a consumer and profit as a producer. According to economic theory this inherent trait of rationality is supposed to drive and influence all of man's actions and choices. Man is theoretically a perfectly rational being who will always make the correct choice, from an economic point of view, when presented with two or more options.

Upon reading this opening passage defining economics and behavioural psychology, it should be apparent that these scientific fields essentially study, and attempt to model or predict, human choices. These two sciences both have overlapping interests. However, both of these social sciences have wildly varying expectations and predictions of human behaviour in response to certain stimuli. This clash, or discord, between behavioural psychology and economics is what interests us in this research paper. We will be examining why individuals do not always conform to what economic theory predicts that they should do. We shall analyse, by drawing inspiration from the field of behavioural psychology and a number of case studies, the reasons why these individuals do not choose to behave in the manner that *homo economicus* is expected to act. We hope to provide an insight into the shortcomings of economics as a sole means to predict human behaviour, and we hope to reinforce the message that many factors and considerations must play a role in any strategic decision.

The central theme of this paper is the effectiveness of monetary incentives and deterrents in shaping human behaviour. Economic theory dictates that individuals should react favourably to these stimuli, however we will see that that this is rarely the case in reality. Firstly, we shall examine the effects of monetary deterrents (I) by analysing a case study concerning a day-care centre that implemented fines in the hopes of decreasing the amount of parents who collected their children late. Secondly, we shall examine the effects of monetary incentives (II) by showcasing a case study performed in Israel that offered fundraising volunteers a percentage of total donations collected in the hope that they would invest more effort into the fundraising project and be more productive in light of the proposed financial compensation.

In both cases we shall see that the individuals in question do not behave as *homo economicus* should in response to these incentives and deterrents. Their behaviour

highlights the shortfalls of economics, emphasises the sometimes-significant role played by non-economic factors in human choices, and underlines the importance of considering behavioural psychology when attempting to strategically modify human behaviour.

I) The effects of monetary deterrents

In this first section we shall examine the effectiveness of monetary deterrents, what economic theory predicts should happen, and what actually happens in real world scenarios. Firstly, we should define what a monetary deterrent encompasses. In order to deter individuals from engaging in harmful or unwanted activities, monetary penalties are often put in place in an attempt to modify their behaviour. Monetary deterrents provide negative feedback as a means to discourage certain choices or actions. A classic, and the most widespread, example of a monetary deterrent is a fine. Fines are a common and versatile tool used in modern society and they are used in a wide range of situations.

In this section we shall be examining a case study published by economists Uri Gneezy and Aldo Rustichini in the year 2000, which is entitled "a fine is a price." This case study, and subsequent analysis of their findings, concerns an experiment involving ten day-care centres for young children where the researchers implemented a monetary deterrent (a fine/financial penalty) punishing parents for picking their children up late. The fine was put in place in the hope of reducing the average amount of parents who arrive late on a given day. Economic theory suggests that the fine should have been an effective deterrent, since humans are considered to be rational actors, however, in reality the parents defied this prediction and reacted in a manner which would appear to be at odds with man's portrayal as *homo economicus*.

The case study methodology was as follows; for the first four weeks the researchers simply observed ten different day-care centres and noted the amount of parents who collected their children late. At the beginning of the fifth week they introduced a fine in six of the ten day-care centres. The fine was imposed on parents who arrived more than ten minutes late. No fine was introduced in the four other day-care centres, which served as a control group. The fine was subsequently removed at the beginning of the seventeenth week, and observation of the day-care centres continued until the end of the twentieth week.

The data that the researchers managed to gather provides valuable insight into the ineffectiveness of monetary deterrents, and also highlights the negative, unanticipated,

and unintended, effects that fines can have on human behaviour and choices. The data shows that following the implementation of a monetary deterrent the number of parents who arrived late to pick up their children actually increased, almost doubling by the end of the observation period. The average number of late arrivals steadily increased over time across all test groups and remained at this elevated level even after the fine had been removed. In stark contrast, the control groups did not experience an overall increase in late arrivals during the same time period, the average amount of late arrivals remained more or less the same for the duration of the experiment. Thus, one can safely conclude that a causal relationship exists in this case study between the implementation of a fine and the increase in late arrivals. The data that the researchers collected and compiled over the twenty-week period can be observed in the table below (figure 1).

NUMBER OF LATE-COMING PARENTS PER WEEK ACCORDING TO DAY-CARE CENTERS

CENTER	No. OF CHILDREN	WEEK																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Test group:																					
1	37	8	8	7	6	8	9	9	12	13	13	15	13	14	16	14	15	16	13	15	17
2	35	6	7	3	5	2	11	14	9	16	12	10	14	14	16	12	17	14	10	14	15
3	35	8	9	8	9	3	5	15	18	16	14	20	18	25	22	27	19	20	23	23	22
4	34	10	3	14	9	6	24	8	22	22	19	25	18	23	22	24	17	15	23	25	18
5	33	13	12	9	13	15	10	27	28	35	10	24	32	29	29	26	31	26	35	29	28
6	28	5	8	7	5	5	9	12	14	19	17	14	13	10	15	14	16	6	12	17	13
Control group:																					
7	35	7	10	12	6	4	13	7	8	5	12	3	5	6	13	7	4	7	10	4	6
8	34	12	9	14	18	10	11	6	15	14	13	7	12	9	9	17	8	5	11	8	13
9	34	3	4	9	3	3	5	9	5	2	7	6	6	9	4	9	2	3	8	3	5
10	32	15	13	13	12	10	9	15	15	15	10	17	12	13	11	14	17	12	9	15	13

NOTE.—The columns under "week" report the number of parents who came late.

Figure 1

Once we average the late arrivals of the test and control groups the unintended effects of the fine become increasingly apparent. These averages have been represented graphically in the following line graph (figure 2) which visually and intuitively emphasises the contrasts between these two groups.

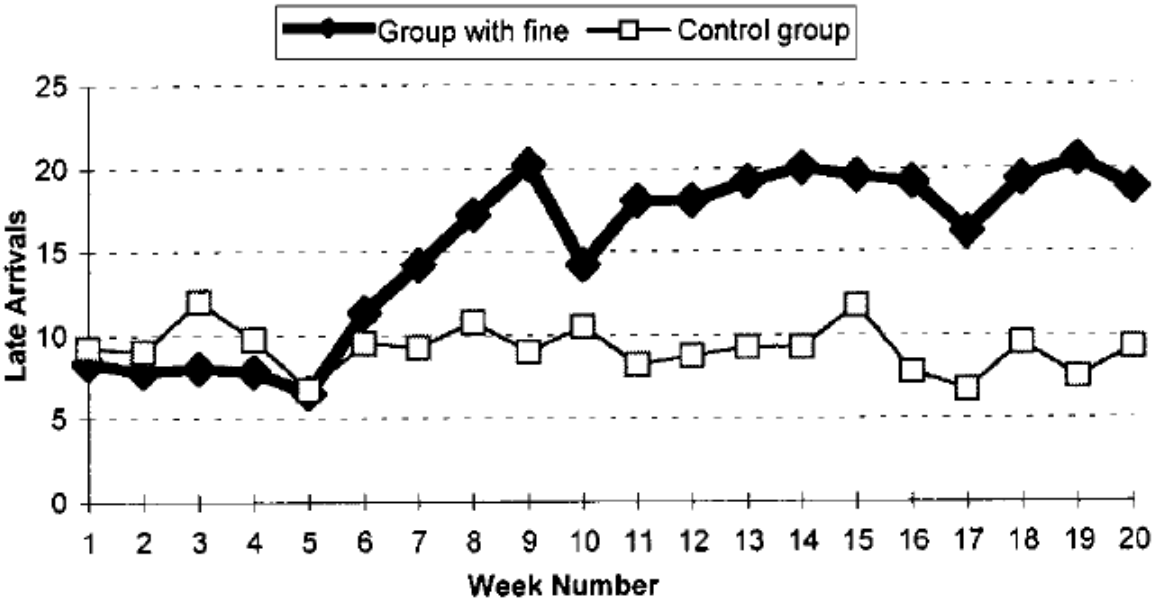

FIGURE 1.—Average number of late-coming parents, per week

Figure 2

Previously, before the implementation of the monetary deterrent, it is believed that parents strived to pick their children up on time due to a number of factors. Specifically, it is hypothesised that the parents were simultaneously trying to comply with social norms and hoping to avoid inconveniencing the day-care centres' staff (late arrivals mean that staff have to work longer). Prior to the fine, parents were subjected to social pressure which dictated that they should pick their children up on time, deviance from this social norm/expectation would have resulted in disapproval from their peers and would have induced strong feelings of guilt and/or remorse. Similarly, parents would not have wanted to force the day-care centre staff to work longer hours due to their late arrival as it would be unpaid overtime and deemed "unfair," similarly this event would also cause disapproval from their peers and induce feelings of guilt and/or remorse.

These non-economic factors were powerful components that influenced and moulded the parents' behaviour before the researchers introduced the monetary deterrent. The fine system was supposed to reinforce these factors and reduce the average amount of late arrivals, however, as we have previously discussed the actual consequences were both unanticipated and unintended. The introduction of the monetary deterrent presented the parents with an opportunity to disregard these two non-economic factors which had previously played a central role in their choices and actions. The monetary deterrent effectively offered the parents the possibility to "buy out" their guilt if they

arrived late by simply paying a fine. The parents also felt that the fine adequately compensated the staff, who were forced to work overtime in the case of a late arrival, which effectively negated the fear of inconveniencing the staff.

The other interesting conclusion that can be drawn from the data is the fact that the average amount of late arrivals did not decrease to pre-fine levels upon the monetary deterrent's removal at the end of week 17. This trend would suggest that once social pressures have been removed or negated they cannot be put back into place, their removal is permanent and irreversible. Thus, when one is considering implementing a monetary deterrence with the aim of modifying human behaviour or choices, it is imperative that non-economic factors that are already in place be analysed. This case study highlights the reality that humans do not always emulate *homo economicus*, and attempting to mould behaviour through economic means may have unanticipated, unintended, and irreversible, consequences.

II) The effects of monetary incentives

The previous section focused on monetary deterrents as a means to modify human behaviour, this second section deals with monetary incentives and their effects on human behaviour and choices. A monetary incentive is the opposite of a monetary deterrent. An incentive offers positive feedback with the aim of reinforcing or encouraging wanted behaviour, whereas a deterrent offers negative feedback as a means of discouraging or inhibiting unwanted behaviour. Although incentives and deterrents appear to be fundamentally opposed, they are essentially two faces of the same coin as they attempt to modify human behaviour by using economic factors to influence the choices of individuals. The concept of *homo economicus* assumes that incentives should be an effective tool, however, as we saw in the previous section humans do not always act in the rational manner that the science of economics expects.

To further explain the effects of monetary incentives on human behaviour, we shall present and analyse the research paper "pay enough or don't pay at all" which was published by economists Uri Gneezy and Aldo Rustichini in the year 2000. This case study portrays the example of an Israeli fundraising/donation project – a charity scheme proposed by the medical society to raise funds from the public in order to fund cancer research.

In this particular fund raising campaign, the researchers classified the fundraiser volunteers into 3 different categories (called "treatments" in the table below), each category was offered a different monetary incentive ranging from no incentive to 10% of donations collected. According to standard economic reasoning, an increase in the financial incentives provided for an activity will improve performance; effort and compensation should have a direct causal relationship.

Gneezy and Rustichini were willing to use this fundraising project as a platform to test the link between the performances of the volunteers in the presence of monetary incentives. In light of the monetary incentives introduced by the researchers, the amount of money that the volunteers could potentially earn depended on the level of effort that they invested in the fundraising campaign. It is worth noting that in Israel

only a limited number of “donation days” are permitted annually where volunteers are allowed to participate in door-to-door fundraising activities. Furthermore, these “donation days” are heavily advertised in advance, therefore the volunteers do not have to ‘‘sell’’ the donation, since most people are already familiar with the fundraising campaign from television and radio announcements and advertisements that are aired in the days preceding the donation day. One can safely assume that the amount of donations received is directly, and linearly, linked to the amount of houses visited. If the volunteers visit more houses (motivated by the monetary incentive) they would theoretically bring in more donations and subsequently earn more money for themselves.

The methodology used in this case study was as follows: In the first test group, a member of the medical society would appear before the volunteers and would give a rousing motivational speech about the social, ethical, and medical, importance of the fundraising project in order to motivate them to collect as many donations as possible. Furthermore, the volunteers were told that the amount of donations collected would be published and made public. In this first test group, no monetary incentive was offered. In the second test group, the volunteers were given the same motivational speech by one the members of the programme. However, a monetary reward was also offered, the students were promised 1 percent of the total amount of donations collected. Finally, the third test group listened to the same motivational speech and they were also offered 10 percent of the donations raised during the fundraising campaign.

In the aftermath of the fundraising campaign, the donations for each group were collected and made public as stated above. Astonishingly, the results showed that the presence of monetary incentives, rather than increasing the amount of money collected, actually yielded a lower amount of total donations. The figures represented in the table below show the exact opposite of what was expected by the economists (figure 3).

SUMMARY STATISTICS FOR THE DONATION EXPERIMENT, FOR THE DIFFERENT TREATMENTS

	No payment	1 percent	10 percent
Average	238.6	153.6	219.3
Standard deviation	165.77	143.15	158.09
Median	200	150	180
Average top 20	375.33	272	348
Standard deviation top 20	111.92	98.64	110.46
Average bottom 20	102	35.33	90.66
Standard deviation bottom 20	66.13	52.08	63.97
20th quantile	100	0	50
80th quantile	450	250	400

Figure 3

As we can see, the introduction of the monetary incentives changes every aspect of the activity. The first test group managed to collect a higher amount of donations than the two other groups (238.6 > 153.6 > 219.3) despite the absence of a monetary incentive. Both test groups that were offered a monetary incentive (1% and 10% respectively) collected a lower amount of donations compared to the first group. The data would appear to contradict the notion advocated by economic theory that effort increases as a direct result of financial compensation.

The increased level of effort exhibited by the first group of volunteers, compared to their counterparts in groups two and three, is undoubtedly the result of an unanticipated non-economic motivational factor. Upon analysing the methodology and the data, the first test group would appear to be motivated by the social commitment that this fundraising campaign implies. It is also worth noting the adverse affect that the presence of a monetary incentive has on performance in this dataset, overall motivation and effort decreases and the monetary incentive would appear to negatively impact their perception of the activity. The monetary reward promised to them negates their initial motivation, which is tied to altruistic social commitments. However, it should be noted that the third test group (10%) collected more donations than the second test group (1%) which implies that monetary incentives do, in fact, affect performance. However, a

monetary reward system may not be as effective as the inherent non-economic factors which are already in place.

Therefore, it is to be noted that not only can monetary compensation change and negatively impact the motivation of individuals, but also that effort varies in relation to the value of the incentive that is proposed. In this particular example, the volunteers would appear to consider the intrinsic value associated with fundraising (altruism, social contributions) as being more valuable than the extrinsic value that the monetary incentives represent. One could conclude that if a monetary incentive of sufficient value were to be proposed, then the total amount of collected donations would surpass those of the first test group. The difficulty from a strategical point of view, if one is looking to provide positive feedback for a particular behaviour, is in identifying the non-economic motivational factors that are intrinsically in place and evaluating their worth compared to traditional monetary incentives. The danger when introducing a monetary incentive is that you run the risk of destroying or negating the intrinsic part of the activity.

Gneezy and Rustichini have succeeded in casting doubt on the standard, and widely accepted, economic theory that an increase in financial incentives provided for an activity will improve performance and effort.

Conclusion

The central theme of this research paper is that economic factors are not necessarily the main driving force behind human choices and behaviours. We have shown that real world applications and tests of economic theory often result in unexpected and unintended consequences. Thus, one can validly question the effectiveness of monetary incentives and deterrents as a means of modifying and manipulating human behaviour.

The majority of economic theory and modelling is based upon the premise that man is a *homo economicus*, a rational actor who seeks to maximise utility. However, the examples provided in this paper should cast doubt on the inherent and ever present rationality of man. Economists Richard Thaler and Cass Sunstein in their study published in 2008 entitled "Nudge" also questioned whether *homo economicus* was an apt description for mankind. They reached the conclusion that "Too often, our impulsive, myopic, unreflective reptile half seizes the levers of choice from our resolute, farsighted, thoughtful human half. we are more *Homer Economicus* than *Homo Economicus*."

What this paper has shown is that economics cannot be relied upon when attempting to understand human behaviour, and the reasons that motivate our choices. A wide range of non-economic factors play a pivotal role in our decision making process, and these factors must be considered and evaluated before introducing economic factors as a means of encouraging or deterring certain behaviours.

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