



Does monetary punishment crowd out pro-social motivation? A natural experiment on hospital length of stay[☆]

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ABSTRACT

We study whether the use of monetary incentives might be counter-productive. In particular, we analyse the effect of fining owners of long-term care institutions who prolong length of stay at hospitals. Exploiting a unique natural experiment involving changes in the catchment areas of two large Norwegian hospitals, we find that hospital length of stay are longer in the hospital using fines to reduce length of stay compared with the hospital not using monetary punishment. We interpret these results as examples of monetary incentives crowding-out agents' intrinsic motivation, leading to a reduction in effort.

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1. Introduction

Are explicit monetary incentive schemes necessarily the best way to motivate economic agents to perform in accordance with social objectives? In recent years, conventional economic theory has been challenged by the theory of *motivation crowding*, which stresses the link between extrinsic and intrinsic motivation.¹ In particular, the theory stipulates that some forms of external interventions might undermine agents' intrinsic motivation to perform a particular task and have unintentional adverse effects.² For example, if offering monetary rewards for pro-social behaviour decrease agents' intrinsic motivation

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¹ See Frey (1997) for a comprehensive treatment. See also Bénabou and Tirole (2003, 2006) for analyses of motivation crowding within a conventional economics framework with exogenous preferences.

² The presence of such crowding-out effects for the case of monetary rewards has long been recognised in the field of social psychology, where the effect has been termed 'The Hidden Cost of Reward' (see, e.g., Deci, 1971, 1972; Lepper and Greene, 1978), although the extent and importance of such effects have been questioned by some authors (e.g., Cameron and Pierce, 1994; Cameron et al., 2001).

to undertake such behaviour, the outcome might (paradoxically) be less pro-social behaviour if the crowding-out effect is sufficiently strong.³

The idea that monetary incentives might crowd out intrinsic motivation has been supported by experimental evidence, especially in psychology but also to an increasing extent in economics.⁴ However, this evidence is mostly based on laboratory or field experiments, and is mostly related to crowding-out effects of *positive* monetary incentives (rewards).⁵ In the present paper, we exploit a unique natural experiment in Norway to test for similar crowding-out effects of *negative* monetary incentives (fines) in the context of hospital length of stay. More precisely, we study the effects of fining owners of long-term care institutions who prolong hospital length of stay, driving hospital costs upwards and causing bed-blocking.

In Norway, hospitals are allowed to impose penalty payments on municipalities (the owners of long-term care institutions) that cannot provide long-term care services in time. By exploiting exogenous changes in the catchment areas of two large hospitals – one that uses a penalty payment system and one that does not – we can study how long-term care institutions respond to changes in the way their interaction with hospitals are regulated. Thus, we have a natural experiment where some municipalities were transferred from the catchment area of the hospital using fines to the catchment area of the hospital that does not use fines, while some other municipalities were transferred the other way. This means that we can study the effect of being exposed to monetary incentives as well as having them removed, where the natural control group consists of the municipalities that belonged to the same catchment area throughout the natural experiment.

Our results clearly support the hypothesis that incentives schemes based on monetary punishment may have counter-productive effects, compared with regimes not relying on such monetary incentives. We find a significant increase in hospital length of stay for patients belonging to municipalities that were transferred from the hospital that does not use fines to the hospital that use monetary punishment, compared with patients belonging to municipalities that did not change catchment area. Although the setting is quite different, this result is in line with the results from the daycare study of Gneezy and Rustichini (2000b). However, there is a symmetry to our results that contrasts with the results from the daycare study. We find that hospital length of stay decreases significantly for patients belonging to municipalities that were transferred in the opposite direction, from the hospital using fines to the hospital that does not use fines. Thus, removing a fine has the opposite effect of introducing a fine.

The remainder of the paper is organised as follows: in Section 2 we present the details of the institutional settings that constitute our natural experiment. Data and descriptive statistics are given in Section 3, while Section 4 presents the econometric method. Results are reported in Section 5, while Section 6 closes the paper with some discussion and concluding remarks.

2. The natural experiment

In Norway the responsibility for elderly patients is divided between state-owned hospitals, which are responsible for organising and financing specialist care, and patients' home municipalities, having the responsibility for long-term care. Hence, when an old, frail patient leaves the hospital after medical treatment the responsibility is carried over from the hospital to the patient's home municipality, a transfer which requires coordination and cooperation between two different governmental levels.

In order to facilitate a smooth transfer between hospitals and long-term care institutions, all hospitals and all municipalities are required to have a coordinating unit for transfers between hospitals and long-term care services. When a patient's discharge date and need for care is clarified, the coordinating unit at the hospital is supposed to contact the coordinating unit in the municipality that will decide when to admit the patient, and is responsible for allocating the necessary long-term care resources to the patient. To ease transfer of patients from the hospital to the long-term care institutions, hospitals and municipalities have worked out some guidelines that regulate the discharge process. In addition, hospitals are allowed to impose fines to municipalities that cannot provide care services in time. More specifically, the hospital can require a daily payment if the patient still stays in hospital 10 days (seven in Oslo) after the medical treatment is completed; i.e., 10 (seven) days after the hospital has put up a discharge date for the patient. The daily penalty rate amounts to 1.600 NOK (2.000 NOK in Oslo). The fact that not all hospitals make use of the possibility to punish the municipalities economically is the starting point of our study, which is based on a natural experiment taking place in two large Norwegian hospitals where one of the hospitals use fines, while the other does not use this possibility. In the following we call the first hospital the 'fines hospital' (F), while the other is called the 'no fines hospital' (NF). Hospital F is located in Oslo, while Hospital NF is located in Akershus, a neighbouring county to Oslo.

The natural experiment took place in 2004, where parts of Hospital F's catchment area were transferred to Hospital NF, while parts of Hospital NF's catchment area were transferred to Hospital F. Before 2004, the catchment area of Hospital F

³ Such a crowding-out effect was famously argued by Titmuss (1970) in the context of blood donations. Titmuss argued that introducing monetary incentives for donating blood would undermine the donors' motivation and lead to an overall reduction in blood donations.

⁴ Some recent studies that find crowding-out effects of monetary incentives in laboratory or field experiments include Gneezy and Rustichini (2000a), Meier (2007), Mellstrom and Johannesson (2008) and Ariely et al. (2009). Frey and Oberholzer-Gee (1997) identify similar effects using questionnaire data. See also the surveys by Frey and Jegen (2001) and Meier (2006).

⁵ A notable exception is the field experiment by Gneezy and Rustichini (2000b), who studied the effect of introducing a fine for parents who came too late to collect their children at daycare centres in Israel. This led to a substantial *increase* in the number of latecoming parents.

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