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An experimental study on the effect of co-payment in public services

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ABSTRACT

This paper aims to shed light on the impacts of imposing co-payment on public services, a strategy increasingly employed in the realm of publicly provided healthcare. We analyze the effect of imposing a charge for the individual appropriation of common resources. In our design, withdrawing the maximum amount is the dominant strategy for every player, but the resulting equilibrium is socially inefficient. We find that the presence of a price that is small enough to leave intact the conflict between individual incentives and collective welfare is not effective in reducing appropriation among agents who have previously been acting without it. In fact, the upward trend in the average extraction of common funds continues after the introduction of a price. In an alternative treatment in which we impose copayment from the outset of the experiment, withdrawals are lower than in the free-access baseline. Our results provide insights on the conditions for the effectiveness of co-payment in curbing the over-consumption of public resources.

1. Introduction

We propose an experimental investigation of the effect of imposing a price for the subtraction of resources from a common fund. Our evidence sheds light on some relevant aspects related to the effectiveness of co-payments in curbing the over-consumption problem, most notably in healthcare services.

The conflict between individual and collective welfare in common pool extraction problems has received attention since the early works by Gordon (1954) and Ostrom et al. (1994), among others. We use the common pool resource paradigm as a metaphor for publicly available services, whose excessive use by the individuals entitled to access it may lead to a collectively inefficient outcome. In other words, the level of individual appropriation is detrimental to social welfare. In this context, our main question is: does the introduction of a *small* co-payment reduce individual extraction levels, thereby increasing efficiency and social welfare? The limited magnitude of the price is designed so that the resulting context preserves intact the social dilemma-type of conflict between individual and collective incentives. Can the focus on the price and/or the sheer "pain of paying" help maintain a high level of common resources? Or, on the contrary, could a "crowding-out" effect arise, whereby potentially prosocial subjects feel legitimated by the price to extract *more* out of the common resource?

The present policy context in Europe characterizes by efforts to reduce public deficits. User charges, often in form of "co-payments", have been introduced for services that were previously provided for free, and exemptions to these charges have been reduced. These measures, frequently applied in healthcare policy, entail a direct effect of a transfer from users to the public administration, while the main stated goal is to reduce the over-consumption of public resources. As we focus on this second aspect, we explore the appropriation of resources following the introduction of co-payments in comparison with *i)* a situation in which the co-payment is not introduced and *ii)* a situation where co-payment has always existed, i.e. the resource was never available for free.

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The first comparison relates to many dilemmas currently faced by European policy-makers in contexts of socialized healthcare. The second comparison serves multiple purposes. On one hand, it shows the effect of the introduction of co-payment as a novelty compared with a stable rules regime. On the other hand, it isolates the effect of the habit to consume the good for free. Our evidence also provides insights on whether co-payment would be more effective for new goods and services that were never publicly available free of charge.

2. Background

Co-payments in healthcare, implying patients' obligation to pay a small part of the cost of service, represent one of the main examples of access charges in public services. They are frequently imposed on primary care visits, on specialized care, and on the purchase of pharmaceuticals. In European countries, there are wide variations in terms of amounts, calculation methods (percentages, fixed fees, etc.) and with respect to which healthcare services are subject to co-payment (Espin and Rovira, 2007). Even bigger differences arise when considering the US and Canada (Mas et al., 2011).

The rationale of co-payments is twofold. First, they *might* improve the financial situation of the payer. In the European context of socialized medicine, this argument makes co-payments look unfair, as they cause a transfer of resources from those who need more care to the rest of the population. Furthermore, as patients may be unable to distinguish the actual benefits, they could reduce the use of effective and ineffective healthcare in similar proportions, as shown in the famous RAND experiment in the U.S. (Manning and Newhouse, 1987). This may lead to negative health impacts and overall higher long-term healthcare expenditure (Gemmill et al., 2008). The second purpose consists of tackling the excessive use of resources. Standard economic theory points out that rational and selfish people use free services up to the point that they provide individual benefits above individual non-monetary costs (e.g. time). From the societal perspective, individual incentives lead to over-consumption, as social welfare would be maximized if resources were consumed up to the point that marginal benefits (usually assumed to be decreasing) equal the social marginal costs of providing them. Thus, imposing an access price in public services can contribute towards a better alignment of individual and social incentives, thereby ameliorating the over-consumption problem.

In our experimental design, we observe whether the introduction of a price can enhance social efficiency, in a context where experimental subjects have perfect information on their own benefit from appropriating public resources, and the corresponding cost for the group they belong to. The size of the price is small, in order to preserve the typical trade-off between individual and collective benefits. An example of a small co-payment is the "euro-per-prescription" applied by the government of the Spanish Autonomous Community of Catalonia in 2012.

In this context, the introduction of a price may modify behavior. As a price is obviously higher than zero, if the usage of resources is a "normal" good, the demand effect should be negative. The presence of a price may also trigger a "pain of paying" effect, whereby the sheer act of paying diminishes the pleasure of consuming a good (Prelec and Loewenstein, 1998).

Possibly, a crowding-out effect may also be triggered by a copayment, whose results go towards the opposite direction. As described in Frey and Oberholzer-Gee (1997), such effects arise whenever people are, in principle, willing to cooperate and take socially oriented choices but when confronted with a price, become more "selfish". The presence of a price may shift the focus away from collective costs and suggest that the individual can "legitimately" compare her own benefit with the amount she would have to spend to access a public resource (Gneezy and Rustichini, 2000). In this case, the individual appropriation of common resources would increase.

3. Experimental design, procedures and predictions

The experiment took place during the first week of July 2012 at the Laboratory of Experimental Economics (LEE) of the University Jaume I, located in Castellón, Spain. A total sample of 125 students participated: 35 in the "Baseline" (B) treatment, 30 in the "Copay" (C) treatment, and 60 subjects in what we will refer to as the "Baseline+Copay" (BC) treatment. Presentations and instructions given to the students made no use of the word "co-payment". Experimental sessions were programmed using z-Tree (Fischbacher, 2007).

In order to avoid possible doomsday effects, subjects did *not* know *ex ante* the total number of rounds (30 in each session). At the beginning of each round, subjects were put into groups of five subjects each. No subject knew the identity of her fellow group members. Subjects *did* know that, after each round, they would be randomly re-matched and that, at the end of the experiment they would be paid according to the payoff achieved in a single, randomly selected round. The random selection of a single round as the basis for payment implies the removal of past accumulated wealth effects. Before the beginning of the experiment, we tested subjects' comprehension of the rules with easy questions on payoffs arising from possible combinations of choices among group members.

In treatment B, at the beginning of each round every group is assigned a common fund worth 100 euro. Each one of the five group members has the option of withdrawing an integer amount between 0 and 10 euro. Each euro withdrawn is transferred to her private fund and reduces the common fund by 2 euro. At the end of each round, what remains of the common fund is equally shared among the members of the group. Therefore, the payoff of a group member is the sum of her private fund and 20% of the amount left in the common fund. For example, if X_i is the amount extracted by player i from the common fund, player i's payoff in any given round equals:

$$Payof\ f_i(B) = X_i + \frac{1}{5}\left(100 - 2\sum_{j=1}^{5} X_j\right) \quad i, j = 1, ..., 5$$

At the end of each round, each subject knows her own payoffs only, without any information regarding the payoffs of the other members of her group.

In this context, the payoff-maximizing strategy for each player is to withdraw the maximum amount permitted, i.e. 10 euro, as each euro taken away from the common fund only reduces her share by 2/5, i.e. 0.4 euro. Assuming rationality and selfishness, in the Nash equilibrium, each group member withdraws 10 euro so that no amount is left in the common fund and each subject gets a payoff of 10 euro in each round, including of course the one randomly selected for the final payment. Clearly, the Nash equilibrium is not Pareto efficient. In particular, if all members refrain from extracting resources from the common fund, they enjoy a payoff of 20 euro each, i.e. twice as much as that obtained in the Nash equilibrium.

In treatment C, for each euro withdrawn from the common pool, the subject has to pay 0.1 euro. All the co-payments enter the common fund and are re-distributed among group members. Therefore, player i's payoff is:

$$Payof\ f_i(C) = X_i - 0.1X_i + \frac{1}{5}\left(100 - 2\sum_{j=1}^{5} X_j + 0.1\sum_{j=1}^{5} X_j\right)$$
$$i, j = 1, ..., 5$$