



## The political economy of sin taxes

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### ABSTRACT

We analyse the determination of taxes on harmful goods when consumers have self-control problems. We show that under reasonable assumptions, the socially optimal corrective tax exceeds the average distortion caused by self-control problems. Further, we analyse how individuals with self-control problems would vote on taxes on the consumption of harmful goods, and show that the equilibrium tax is typically below the socially optimal level. When the redistributive effects of sin taxes are taken into account, the difference between the social optimum and equilibrium is small at low levels of harm, but becomes more pronounced when consumption is more harmful.

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## 1. Introduction

We analyse the determination of taxes on goods whose current consumption causes utility costs (for example negative health effects) in the future. When consumers have time-inconsistent preferences, they consume too much of such goods. Using “sin taxes” to correct distortions in the consumption of harmful goods when consumers have self-control problems has also been considered in O’Donoghue and Rabin (2003, 2006).<sup>1</sup>

Market-based mechanisms for correcting the distortion caused by self-control problems are likely to be ineffective (see Köszegi, 2005), and consumers might value sin taxes as a commitment device. In addition to the monetary cost of taxation, sin taxes affect individual utility due to the corrective nature of the tax when preferences are time-inconsistent. If this positive effect outweighs the monetary cost, sin taxes can improve individual welfare—see Gruber and Köszegi (2004) and Kotakorpi (2008) for theoretical analyses and Gruber and Mullainathan (2005) for empirical evidence.

The main purpose of the current paper is to analyse how sin taxes are determined in political equilibrium, and to compare the equilibrium tax with the socially optimal level. Previous literature has focused on optimal taxes, and our analysis of equilibrium sin taxes is therefore an important extension to the literature. Putting the paper in a broader context, it provides a contribution to the nascent field of behavioural political economy. We are aware of only a few earlier contributions in this field (Bassi, 2008; Cremer et al., 2007; Frogneux, 2009; Eisensee and Strömberg, 2007; Osborne and Rubinstein, 2003). In a recent survey of literature in behavioural economics, DellaVigna (2007) identifies political economics as one of the most promising fields of further research where behavioural economics could be more extensively applied.

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<sup>1</sup> For an analysis of sin taxes within the broader context of non-welfarist optimal taxation, see Kanbur et al. (2006).

In order to obtain a reference point to which the equilibrium sin tax is to be compared, we first derive an expression for the optimal sin tax in a second-best setting: That is, we assume that individuals differ in their degree of self-control problems, but a uniform tax is applied. This is in line with the earlier literature on sin taxes. A simple reason for concentrating on a second-best setting is that implementing first-best (individualised) taxation would require personal consumption levels to be observable to the authorities—an assumption that would in most situations be very unrealistic.

Many economists have been concerned that uniform sin taxes as well as other paternalistic policies aimed at helping irrational individuals<sup>2</sup> are often detrimental for the welfare of rational individuals.<sup>3</sup> This has resulted in an emphasis on a search for policies that help irrational individuals while having only a small or no impact on those who are rational.<sup>4</sup> However, it seems natural that economists should not restrict themselves to study minimal interventions, but we should also engage in analysing *optimal* policies. Indeed, there has recently been a move in this direction—see in particular O'Donoghue and Rabin (2006), who examine the conditions under which the optimal utilitarian sin tax is positive, and provide some comparative statics of the optimal sin tax when there are changes in the distribution of self-control problems. They also analyse whether sin taxes can yield Pareto improvements (compared to zero taxes).

We analyse the trade-off between benefits to irrational individuals and costs to rational individuals further, and find the optimal balance between them by deriving a formula for the socially optimal utilitarian sin tax. We find that even though the social planner sets the corrective tax to maximise the expectation of individual welfare, the second-best optimal sin tax exceeds the average distortion caused by self-control problems in the economy. The reason is right at the heart of the recent discussion on paternalism: for reasonable assumptions about the form of the demand function, sin taxes have a relatively small (negative) effect on the utility of (close to) rational individuals, who consume relatively little of the good. On the other hand, irrational consumers with a very high level of consumption gain a lot from sin taxes.

We then turn to analyse the majority voting equilibrium. We assume that individuals are fully aware of their self-control problem, and vote on the sin tax to be implemented from the next period onwards. Taxation can then provide a commitment device that helps individuals move their consumption closer to its optimal level.

Sin taxes have two effects on consumer welfare and thus there are two mechanisms that affect the consumer's voting decision: Firstly, sin taxes correct (or distort) consumption decisions (depending on whether the consumer suffers from self-control problems or not). Secondly, linear sin taxes redistribute income from irrational large-scale consumers towards more rational consumers with a low level of consumption. As a benchmark, we consider the case where tax revenue is distributed back to consumers in such a way that the redistributive effects of taxation are eliminated. This setting is unrealistic, as it requires personalised transfers and therefore information on each consumer's type. However, this analysis is useful in disentangling the corrective and redistributive roles of sin taxes, and in understanding how these two mechanisms affect the determination of equilibrium taxes.

In the setting without redistributive effects, individuals prefer the level of taxes that completely eliminates the distortion in their own consumption, and the political equilibrium is the tax rate that corresponds to the median level of self-control problems. We show that there is a bias in voting behaviour, which tends to make the equilibrium tax too low: the asymmetric effect of sin taxes at different ends of the distribution of self-control problems is not taken into account by the median voter. However, in this setting where sin taxes have no redistributive effects, there is one particular case where the equilibrium and the social optimum coincide: this is when consumption is so harmful that the optimal level of consumption is zero even in the absence of taxation. In this case, it is in the interests of both the consumers and the social planner to eliminate all consumption.

The main part of our analysis concerns the more realistic case where redistributive effects of sin taxes are taken into account. On the one hand, an individual without self-control problems will prefer a low tax, as high taxation would distort his consumption choice. On the other hand, however, the redistributive effects of sin taxes provide a reason for consumers with no self-control problems to vote for a high tax. Despite these counteracting motives, we show that a majority voting equilibrium exists also in this case, and corresponds to the tax rate preferred by the individual with the median level of self-control problems.

Further, we show that when harmful health effects are mild, the redistributive effects of sin taxes work rather well in aligning the median voter's preferences with those of the utilitarian social planner: even though equilibrium taxes are still typically below the socially optimal level, the difference is small both in absolute terms and also compared to the level of taxes. However, the mechanism seems to work well only at low levels of harm, and the difference between the equilibrium and the optimum becomes more pronounced when consumption is more harmful. Importantly, we show that when redistributive effects of sin taxes are taken into account, the equilibrium tax rate tends to be below the socially optimal level *regardless* of the level of harm from consumption. Perhaps paradoxically, the redistributive motive for taxation

<sup>2</sup> Throughout the paper, we refer to individuals with a self-control problem as irrational, as they behave in an inconsistent manner and make consumption decisions that fail to maximise their own life-time utility. Similar terminology has been used for example by O'Donoghue and Rabin (2006).

<sup>3</sup> Beyond this concern, some economists remain sceptical about paternalism for more general reasons—see for example Glaeser (2006) for a critical view. For example, the possibility of government failure may reduce the effectiveness and desirability of paternalistic policies. Despite the importance of this consideration, we abstract from this issue in the current paper. On the other hand, we show that in our model consumers would themselves vote for paternalistic policies: such policies can therefore be the outcome of a democratic decision making process, which has interesting implications for the justification of paternalism.

<sup>4</sup> See for example Camerer et al. (2003), Thaler and Sunstein (2003) and O'Donoghue and Rabin (1999).

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