'Spite effects' in tax evasion experiments[☆]

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ABSTRACT

This paper sets out to consider individuals' motivations to evade taxation. Experimental results indicate that individuals do not simply maximize pecuniary welfare. Their behaviour is consistent with the presence of a 'spite effect' when their perceptions are that enforcement variables are 'excessive'.

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1. Introduction

While important from a theoretical standpoint, the way that tax evasion is modelled also has important implications when designing policy to reduce illegal activity (as discussed in Hammar et al., 2009). From the 'standard' economic perspective, higher levels of enforcement variables – the audit rate and the fine or penalty rate – increase tax compliance. Kirchler et al. (2010) survey the findings of empirical studies. Of 37 studies, 17 were experiments and, of the 11 that reported a sign for the predicted impact of an increased audit rate on compliance, 10 were positive (the remaining study suggested no effect). With respect to the fine rate, only 8 results were listed; 4 were positive, 3 indicated no effect and 1 proved ambiguous.

Even so, a growing number of empirical and experimental studies indicate that increasing the level of enforcement variables might decrease compliance (e.g. Andreoni et al., 1998; Fjeldstad and Semboja, 2001; Chovart, 2006). One argument that has been presented to explain this relationship relies on the perception that tax rules (as represented by these enforcement variables) are relevant in a 'psychological contract' between taxpayers and tax authorities. If this contract is violated individuals respond by reducing compliance and, if increasing the level of enforcement is viewed as a violation of a psychological (or implicit) contract (Feld and Frey, 2002), a reduction in compliance might reflect a 'spite effect'.

Social dilemma games often indicate that individuals are not simply motivated by instrumental rationality. The notion of reciprocity has attracted attention. This suggests that individuals are capable of 'hot blooded' responses. Individuals are sensitive to the way they "... are treated by others ..." (Bowles and Gintis, 2006:172). "Reciprocity means that in response to friendly actions, people are frequently much nicer and much more co-operative than predicted by the self-interest model: conversely, in response to hostile actions they are frequently much more nasty and even brutal." (Fehr and Gachter, 2000: 159). Behaviour by others, including government, is a very important consideration. Individuals repay gifts (or take revenge). They *incur costs that generate neither present nor future material rewards*. In this paper 'spite' is defined as a choice that incurs costs. It is the choice that individuals make when they evade tax even when they might have complied with taxation and enjoyed a higher monetary reward. This definition of 'spite' colloquially accords with the phrase "cutting off your nose to spite your face"; costs are incurred that appear to reduce the taxpayer's own 'welfare' and contradict instrumental rationality. In this paper the objective is to consider the possibility that an increase in the audit rate and in the penalty for tax evasion might decrease tax compliance because this engenders a 'spiteful' response.

Findings in neuroeconomics suggest that a similar set of brain regions process all rewards and losses, and that this processing is independent of the form of the rewards or losses, e.g. money/self respect. 'Doing the right thing' in an individual's view activates

the reward circuitry in the brain, so that individuals who, for example, choose to punish social norm transgressors at apparent cost to themselves are rewarded in their brains mainly via the dopamine system. The proposition that emotion affects decisions is a major distinction that separates a neo-classical expected utility maximisation perspective from a more behavioural/neuroscience perspective. Emotions play a big part in risk taking and risk aversion. Shiv et al. (2005) find that patients, with lesions in specific components of their neural circuitry processing emotion, make more financially rewarding decisions when they are faced with positive expected value type gambles (than non-lesioned individuals). The negative side of emotions is that individuals make pecuniary inferior decisions (than they would if emotion were removed). Explanations of neuro processing in making decisions – displaying spite – are likely to be relevant when explaining the instrumentally irrational behaviour reported in this paper.

Of course, 'spite' can be defined in other ways. In the context of auctions Cooper and Fang (2008: 1578) define 'spite' if "bidders . . . care not only about their own surplus in the event of winning the auction but also about the surplus of their winning rival in the event they lose the auction". In this context spite is directed at rivals; when considering tax evasion, spite might be directed at 'capricious' tax authorities.

'Spite' has also been analysed when explaining behaviour in public goods games. It has been argued that, in a public good game (with marginal benefits set so that free riding is the optimal strategy), punishment with costs incurred by the sanctioning subject is evidence of spiteful behaviour. When this behaviour is implemented on both co-operative and uncooperative sanctioned subjects (Falk et al., 2005) spiteful sanctions appear to be driven by a preference for inequality.

While spite might be driven by different motivations, in this paper 'spite' occurs when individuals deliberately choose options that incur material costs (when they 'cut off their nose to spite their face'). Is there evidence that an increase in the level of enforcement variables can reduce tax compliance? Is there evidence consistent with the proposition that taxpayers voluntarily choose to reduce their welfare (defined in pecuniary terms) to spite tax authorities?

2. Defining 'spite' in a tax evasion context

Fig. 1 displays the typical shape of the utility function for the risk-averse actor that generally populates the neo-classical world. In tax evasion models there is generally a certain outcome that an individual can choose by honestly paying the taxes that are due. In 'evasion as crime' models (associated in particular with Allingham and Sandmo, 1972 and Yitzhaki, 1974), tax evasion only offers expected utility. Fig. 1 illustrates the expected utility associated with the weighted probability of 'income when caught' and 'income when not caught' (Y_c and Y_{nc} respectively).

Suppose honest declaration offers a post-tax income of Y_h (generating utility Uh) at point 1. For an instrumentally rational individual, the decision to evade must offer a higher expected utility than the utility associated with Y_h. That is, the expected value of income on choosing evasion must lie along the segment point 2 to point 3 (as any point along this segment, despite being risky, offers greater utility than Uh). The utility of the expectation offers more utility than the utility of the certain income (Y_h). If the expected value of income on evasion is below Y_h individuals make themselves worse off by evading – a 'spite effect'. This occurs anywhere along the line segment 3–4 in Fig. 1.

In later sections of the paper it will ease exposition to assume that individuals are risk-neutral (and to reduce the relevant segment in Fig. 1 to 5–4). However it is important to emphasise that, while the analysis of results in Section 4 of the paper depends on the
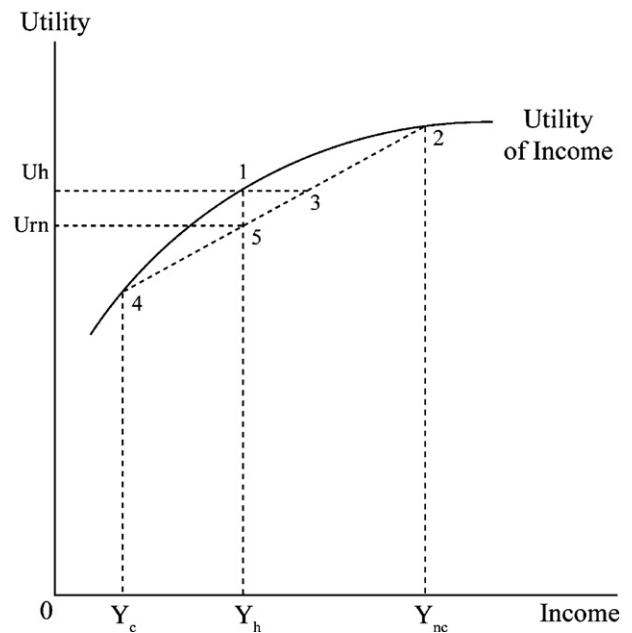

Fig. 1. Defining "Spite".

assumption that individuals are risk neutral, this analysis is equally applicable if individuals are risk averse. With risk neutrality a 'spite' effect will be detected if the expected utility derived from tax evasion is lower than the certain equivalent of Y_h (i.e. Urn) because there are very high enforcement variable parameters.

In the experiments reported below three audit and penalty rates are employed – low, medium or high ('Draconian'). The audit rates (p) are 0.1, 0.3 and 0.5, whereas the penalty rates (α) are 2, 8 and 15. A brief description of the tax compliance model and implementation of the experiment and questionnaire are presented in Section 3. Section 4 presents the results. The results indicate that there are spite effects in the data and that, under certain conditions, an increase in the enforcement variables leads to both a reduction in compliance and 'narrowly defined' individual utility (a result that does not conform to the predictions of standard theory). Section 5 discusses some concerns about the experimental design and Section 6 briefly concludes.

3. The model and the experiments

3.1. Theoretical background

The individual with actual income, I, declares an amount, X, that is taxed at a given rate, t. The associated deterrent measures are represented by a probability of audit by the tax authorities, p, and (as in Yitzhaki, 1974) a penalty paid as a multiple of the unpaid tax on concealed income, $\tau(I - X)$; $\tau = \alpha t$ ($\alpha > 1$). The optimal level of income to declare, X^*, with $E[U(X)]$ representing expected utility, is determined by maximizing:

$$E[U(X)] = (1 - p)U(I - tX) + pU(I - tX - \tau(I - X)) \qquad (1)$$

Under the assumption of risk-averse behaviour, the result of increasing the audit and penalty rate is a reduction in evasion (e.g. see Cullis and Jones, 2009). The analysis in Section 4 depends on the assumption of risk-neutrality and we have adopted expected values to calculate pecuniary welfare: $EV(X) = I - tX + p\alpha t(X - I)$.

A spite motive may be attributed when $p\alpha > 1$ and declared income is below full compliance (the optimal level). However, when $p\alpha < 1$ complete evasion represents optimal behaviour, so