Journal of Economic Psychology 30 (2009) 147–161

Contents lists available at ScienceDirect

Journal of Economic Psychology

journal homepage: www.elsevier.com/locate/joep

A behavioral Laffer curve: Emergence of a social norm of fairness in a real effort experiment

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ARTICLE INFO

Article history:
Received 17 September 2007
Received in revised form 29 August 2008
Accepted 17 September 2008
Available online 25 September 2008

JEL classification:
C72
C91
H30
J22

PsycINFO classification:
2360
2960
3040

Keywords:
Taxation and labor supply
Laffer curve
Experimental economics
Fairness and efficiency
Social norms and sanctions
Informational asymmetry
Emotions

ABSTRACT

This paper demonstrates, through a controlled experiment, that the "Laffer curve" phenomenon does not always reflect a conventional income - leisure trade-off. Whether out of reason or out of emotion, taxpayers may also be willing to punish intentionally unfair tax setters by working less than they would under the same exogenous circumstances. We conduct a real effort experiment in which a player A (the "tax receiver") is matched with a player B (the "worker") to elicit the conditions under which tax revenues will increase under a certain threshold and decrease thereafter. We ran four different treatments by manipulating work opportunities and the power to tax. Consistent with the history of tax revolts, the working partner overreacts to the perceived unfairness of taxation when the tax rate exceeds 50%, most strongly so in the high effort treatment. With two types of players, selfish and empathic, our model predicts the emergence of a social norm of fairness under asymmetric information, and elicits the optimal and emotional patterns of punishments and rewards consistent with the norm's enforcement. The social norm allows players to coordinate tacitly on a "focal equilibrium", which offers a solution to the indeterminacy raised by the Folk theorem for infinitely-repeated games and a behavioral justification for the tit-for-tat strategy. The social norm of fairness enhances productive efficiency in the long run.

1. Introduction

The quest for American independence grew as issues like taxation without representation in the British government angered the local population of the former British colonies. When the British decided to tax the colonists to pay a share of their expensive war against the French and Indians, the colonists were angry and rallied behind the phrase, "No Taxation without Representation". The British were then forced to remove (1764–1767) most of the unfair taxes (tax on sugar and Stamp Act,

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doi:10.1016/j.joep.2008.09.002

Townsend Act) that they had been trying to enforce unilaterally. Two centuries later, the same scenario repeated in California as property taxes went out of control. Taxpayers were losing their home because they could not pay their property taxes, yet the government maintained the burden. California taxpayers stood up and passed Proposition 13 (1978) that reduced property taxes by about 57%. The tax revolt that swept the country had a worldwide impact.

Since then, tax revolts have been closely associated with the name of Arthur Laffer who forcefully defended as a simple rule of public finance that there is a unique optimal tax rate which maximizes revenue collection. If the tax level is set below this level, raising taxes (more specifically, marginal tax rates) will increase tax revenue. However, if the tax level is set above this level, then raising taxes will decrease tax revenue. This proposition, now called the "Laffer curve", had considerable influence on fiscal doctrine, and fuelled the "supply side economics" argument that a tax cut would actually increase tax revenue if the government is operating on the *right* side of the curve.[1]

The Laffer curve was based on conventional economic analysis: tax revenues are obviously zero if the tax rate is zero, and are still zero if the tax rate is equal to one, as rational agents would withdraw from the market to evade tax or consume untaxed leisure.[2] However, our paper demonstrates that the Laffer curve phenomenon does not always reflect a conventional income – leisure trade-off. Consistent with the history of tax revolts, we demonstrate the existence of a "behavioral Laffer curve" that will arise as a reaction to the perceived unfairness of taxation by a Leviathan government. Whether out of reason or out of emotion, taxpayers are willing to "punish" tax setters who *intentionally* violated the social norm of fair taxation by working less than they would under the same exogenous circumstances. We further point out that the behavioral Laffer curve peaks at a substantially lower tax rate than the conventional Laffer curve.

Natural experiments have been widely used for assessing the impact of a tax policy change on taxable income (e.g. Lindsey, 1987; Feldstein, 1995; Goldsbee, 1999; Sillamaa & Veal, 2000; Gruber & Saez, 2002).[3] However, it is not possible to confirm, by means of a natural experiment, the role played by intentional over taxation of productive workers in tax revolts because intentions are unobservable. Laboratory experimentation in real effort is a more appropriate tool for eliciting the behavioral Laffer curve. Earlier experiments by Swenson (1988), Sillamaa (1999a) and Sutter and Weck-Hannemann (2003) studied the effect of tax rates on work effort. In Swenson's experiment, subjects were confronted with discrete tax rates chosen by the computer and were asked to perform a number of real tasks. Swenson (1988) found a negative substitution effect with subjects decreasing their effort when the tax rate increases. Sillamaa (1999a) replicated Swenson's results. Sutter and Weck-Hannemann (2003) considered the effect of an endogenous variation of the tax rate on labor supply and brought evidence of a Laffer curve with tax revenues peaking at tax rates between 50% and 65%.

In our experiment, participants are paired. In each pair, one randomly selected participant is asked to choose and exert a *real* effort, and the resulting output is taxed to the benefit of her partner. The working subjects are confronted with a set of four different flat tax rates (12%, 28%, 50% or 79%) and are asked to choose and perform a discrete number of real tasks conditional on the tax rate imposed on them. We ran four different treatments depending on work opportunities (a ceiling of 26 or 52 tasks allowed to the worker) and on the power to tax effectively given to the worker's partner. In the *exogenous treatment*, the computer randomly selects the tax rate and the non-working partner merely receives the revenue from taxes. In the *endogenous treatment*, the non-working partner chooses a tax rate among the set of possibilities and receives the revenue generated by the worker's effort response to this tax rate.

Our study brings several important innovations to previous experiments. First, it provides a comparison of the endogenous and exogenous treatments that allows capturing the potential emotional reaction to unfair taxation.[4] Second, we introduce two treatments for work opportunities, which allows us to show that workers' response to unfair taxation critically depends upon work opportunities and the intensity of emotional arousal (Bosman & van Winden, 2002).[5] Finally, by repeating the experiment among partners for an indefinite number of periods, we come closer to historical conditions and we can observe the emergence of a social norm of fair taxation enforced by effective punishment of violators. Although indefinite repetition of the game leads to a multiplicity of potential Nash equilibria, we propose a novel theory of pre-play intentions of players, which generates a social norm of fair taxation under asymmetric information with heterogeneous players. The social norm allows players to coordinate tacitly on a "focal equilibrium", which offers a solution to the indeterminacy raised by the Folk theorem for infinitely-repeated games.

[1] Laffer (1974) does not claim credit for this idea, which had been anticipated at least by the Islamic scholar Ibn Khaldun in the 14th century, by the French economist Frédéric Bastiat in the 19th century, and by John Meynard Keynes. However, the concept was attributed to him in 1974 by a Wall Street Journal columnist.

[2] The empirical literature shows little responsiveness of labor supply to taxation. However, taxable income is much more responsive to tax changes than hours of work because there are many ways for income earners to adjust to a tax increase like reducing their effort (not hours), changing the form of their compensation, switching to less taxed activities and avoiding tax.

[3] For example, the marginal tax rate on the highest-income individuals fell abruptly from 50% to 28% in the US after the 1986 Tax Reform Act.

[4] In contrast, Swenson (1988) and Sillamaa (1999a, 1999b) only had an exogenous treatment and Sutter and Weck-Hannemann (2003) only had an endogenous treatment.

[5] Our endogenous treatment differs from the experimental design of Sutter and Weck-Hannemann (2003) on several details. The latter used the strategy method in which taxpayers first indicate their choice of effort for tax rates ranging from 0 to an upper limit in 5%-steps and commit themselves to supply the reported effort once another player has chosen his preferred rate. They also required that the marginal income decrease with the number of tasks, which may be an unnecessary complication since the marginal disutility of effort, which cannot be controlled in a real effort experiment, is likely to increase anyway. The marginal income was kept constant in our design. Finally, Sutter and Weck-Hahnemann limited the game to only two periods and asked participants to vote on the upper limit of taxation in the second round. The effective tax rate was determined by the median vote. We are not concerned with voting in this experiment because we focus on the comparison of behaviors between the four treatments.