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Fiscal policy as a temptation control device: Savings subsidy and social security☆

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ABSTRACT

In an environment where individuals suffer from temptation and self-control problems, there are induced preferences for commitment devices. We show that the savings subsidy and social security programs can be properly designed to mitigate the adverse effect of succumbing to temptation and release severity of self-control. Moreover, we disentangle the mechanics behind the two fiscal programs and find that the driving forces are quite different. Welfare gains associated with a social security program result mainly from releasing self-control costs. Conversely, welfare gains associated with a savings subsidy program are mainly driven by mitigating inter-temporal allocation distortions. Interestingly, the direction and size of welfare effects vary substantially when general equilibrium channels are in play. Our results have implications for designing an effective temptation control device using fiscal policy.

1. Introduction

There is a long standing literature in psychology and economics that finds evidence suggesting that consumers suffer from self-control problems.[1] "Excessive" impatience caused by lack of self-control distorts individuals' inter-temporal allocation in favour of present consumption and undermines incentives to save for future consumption. In an environment where an individual consumer faces self-control problem, the number of choices matter for welfare as availability creates an urge for any potentially tempting alternative which might be costly to control. A consumer with lack of self-control would have lower utility in an ex ante sense if tempting allocations are available in her choice set, and would be better off if choosing out of a smaller set.

Gul and Pesendorfer (2001), Gul and Pesendorfer (2004) and Gul and Pesendorfer (2005) formalize the ideas of temptation and self-control and propose a new type of preferences.[2] They show that the size and shape of the choice set directly influence the temptation and self-control consumer's behavior and utility. The departure from standard preferences has implications for the role of markets and governments in provision of commitment devices. In particular, when the market mechanism for commitment is absent, the urge of temptation and severity of self-control costs give rise for government intervention. Indeed, policy makers would be left with an important question of how to conduct economic policy: should the government intervene in markets to alter individual behavior? In particular, should governments use fiscal policy to correct the present consumption bias caused by temptation and to eliminate self-control costs?

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[1] Frederick et al (2002) provide a review of experimental evidences documenting that individuals indeed exhibit bias toward immediate gratification. Ameriks et al. (2007) conduct a survey to measure self-control problems and find that self-control problems are smaller in scale for older than for younger individuals. Moreover, in a recent paper Fang and Silverman (2001) empirically find the existence of time-inconsistency that stems from self-control problems. Huang et al (2007) and Bucciol (2012) study the empirical relevance of self-control preferences using household-level data from the Consumer Expenditure Survey and find evidence supporting the presence of temptation.

[2] The axiomatization delivers a representation theorem with utility over consumption sets expressed in terms of two utility functions: commitment utility, which gives the ranking that consumers use to compare consumption bundles; and temptation utility, which plays a key role in determining how actual consumption choices depart from what commitment utility would dictate. This "temptation and self-control preferences" approach formulates the consumer's temptation and lack of self-control problem in terms of preferences over the choice sets. It does not necessitate splitting up the consumer into multiple selves as in the "time inconsistent preferences" literature, which dates back to Strotz (1956), Phelps and Pollak (1968) and Laibson (1997).

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In this paper we formulate an overlapping generations model with temptation and self-control preferences to study how savings subsidy and social security programs can be designed to work as a temptation control device. The main goal of the paper is to isolate the mechanics behind the two fiscal programs, quantify the welfare effects as well as to analyze implications for designing an effective intervention policy.

To that end we formulate a partial equilibrium, two-period overlapping generations model filled with individuals who have temptation and self-control preferences, and the absence of market mechanisms for commitment. Our model captures essential features of dynamic interactions between the self-control problem and individuals' optimal inter-temporal allocation, while it is simple enough to allow us to obtain some analytical insights. We then conduct a quantitative analysis. Finally, we extend our analysis to include general equilibrium adjustment channels as well as more realistic features of demographic structure and budget composition. Our main results are summarized as follows.

First, we identify two transmission channels through which lack of self-control influences affects welfare: distorting inter-temporal allocation and triggering dis-utility costs of self-control. The former is referred as *the inter-temporal allocation channel,*while the latter is called *the self-control channel*. We analytically decompose the welfare effect of temptation according to these two transmission channels and then conduct a quantitative analysis. We find that the effects through the self-control channel are a main source of welfare losses. Thus, we demonstrate that there are induced preferences for commitment devices in our environment, that reflects a wish both to reduce self-control cost, and to eliminate inter-temporal allocation distortion.

Next, we analyze whether savings subsidy and Pay-As-You-Go (PAYG) social security programs could work as a temptation control device. We identify the underlying mechanisms behind the welfare effects of the two fiscal programs: (*i*) mitigating the adverse effect of succumbing to temptation on inter-temporal choice, and (*ii*) reducing the dis-utility cost of self-control. More specifically, we find that an introduction of the savings subsidy and social security programs mitigates the temptation distortions by eliminating the adverse effect of succumbing to temptation on inter-temporal allocation, and by reducing dis-utility cost of self-control. That is, the fiscal distortions created by the two programs unwind the distortions caused by temptation, and eventually result in favorable welfare outcomes. More importantly, we find that the driving mechanisms the two programs are quite different. A savings subsidy program operates mainly through mitigating the temptation distortions to inter-temporal allocation of consumption over the life-cycle, while a PAYG social security program operates mainly through releasing dis-utility costs of self-control.

Overall, our quantitative results indicate that both fiscal programs lead to welfare gains in a partial equilibrium model, and alleviating severity of self-control costs is the main channel at work. As a result, a PAYG social security program dominates a savings subsidy program in terms of welfare in a partial equilibrium environment. Interestingly, when accounting for general equilibrium effects we find that mitigating inter-temporal allocation distortions becomes a dominating channel. The intuition is that general equilibrium price adjustments amplify the inter-temporal allocation distortions caused by the presence of temptation in preferences and makes the inter-temporal channel a dominant force. This subsequently makes the final welfare effect of a savings subsidy program more pronounced.

Our findings highlight the key driving forces behind the welfare effects of fiscal policies in an environment where individuals suffering from temptation and self-control problems, and isolate which one is quantitatively important. More importantly, we provide a comparison of a savings subsidy program to a social security program, and highlight the mechanisms at work in both partial equilibrium and general equilibrium models. The novelty of our analysis allows us to identify the main drivers of welfare variation. Our results carry important implications for designing an effective fiscal policy to correct the behavioral issues caused by temptation and self-control problems. Understanding the mechanics of these two transmission channels contributes to understanding the corrective role of fiscal policy and the timing of intervention.

1.1. Contacts to the literature

There is a parallel literature on optimal commodity taxation when self-control issues are present (e.g., see Gruber and Koszegi (2001), Gruber and Koszegi (2004), O'Donoghue and Rabin (2003) and O'Donoghue and Rabin (2006)). That literature includes "sin good" as goods for which preferences are time-inconsistent. Individuals optimally choose to consume more now and less in the future. However, next period they also optimally choose to consume more now and less in the future in a model with "sin goods" . Yet, individuals are rational, but over-consume due to lack of self-control. These behavioral issues give rise for government intervention to help individuals to overcome consumption bias. In particular, imposing a commodity tax on "sin goods" reduces consumption to a level which households would choose if they could pre-commit to consume less in the future. In a similar fashion, we show that the present consumption bias appears in a consumption–savings model when individuals succumb to temptation. We also demonstrate that subsidizing savings is an implicit way to tax present consumption in order to correct the consumption bias in our analysis.

Our study contributes to a branch of the macro/public finance literature in analyzing the role of fiscal policies in an environment in which individuals face self-control problems. Laibson (1996) find that optimal capital income tax rate is negative when individuals suffer from self-control problem due to time-inconsistent preferences. Krusell et al. (2009) and Krusell et al. (2010) characterize the role of tax policy in a model in which agents succumb to temptation. They show that the optimal capital tax rate is negative, i.e. the optimal tax policy prescribes a subsidy to savings/investment, which is in contrast to the well-known Chamley–Judd result in the optimal taxation literature (Chamley (1986) and Judd (1985)). Differently, we focus on isolating transmission channels behind the welfare effect of a savings subsidy program. We propose a welfare decomposition exercise and highlight how subsidizing savings mitigates inter-temporal allocation distortions. Moreover, we extend the previous literature to compare differences in welfare outcomes between partial and general equilibrium analysis. We demonstrate that a "small" distortion in preferences results in "big" aggregate and welfare consequences when accounting for general equilibrium channels.

Our paper is connected to a large literature analyzing the redistributive role of the PAYG system (Diamond (1965), Auerbach and Kotlikoff (1987), and Imrohoroglu et al. (1999)). The presence of temptation and self-control problems gives rise for PAYG social security as a device to control temptation. Kumru and Thanopoulos (2008) and Bucciol (2011) quantify the role of social security in a large scale overlapping generations model. They show that temptation and self-control problems give rise for a social security program as a device to reduce self-control cost. Kumru and Thanopoulos (2011) study the effects of privatizing social security systems with a model in which agents have self-control preferences. Kumru and Tran (2012) analyze the role of social security when self-control problem and altruistic concern are both present. Notice that, these authors conduct analysis in dynamic general equilibrium overlapping generations models with heterogenous agents generated by earning shocks and uncertain lifetime. In their frameworks, PAYG social security plays two roles: a form of social insurance against interruption or loss of earnings (redistributive) and a temptation control device (corrective). Unfortunately, in that complex stochastic