

# **Measuring and Addressing Self-Control Problems: Commitment Contracts vs. Piece-Rate Incentives**

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## **Extended Abstract**

Since the dawn of time-inconsistent preferences, the demand for commitment has been a central theme of behavioral economics and the take-up of commitment contracts has been the smoking gun of evidence for awareness of present bias. There has been an explosion of empirical work on the demand for commitment contracts in domains such as exercise, smoking cessation, effort at work, alcohol consumption, and savings. From this research it is clear that people often demand commitment contracts and these contracts change behavior. This evidence has led to three popular perspectives about commitment demand: 1) there is often puzzlingly low demand for commitment, 2) naiveté likely depresses demand for commitment contracts but 3) with some degree of sophistication, commitment contracts are a good theoretically grounded policy tool because they are more targeted than price instruments like taxes and subsidies. This paper reports new theoretical and experimental results that point to the opposite of these three perspectives.

We begin by exploring the conditions under which present bias leads to demand for commitment contracts. Prior research, including Amador et al. (2006) and Beshears et al. (2017) has provided qualitative theoretical results about the optimal shape of contracts that trade off the desire for commitment versus flexibility. However, prior literature has not provided sharp theoretical results about how much uncertainty it takes to eliminate the desirability of commitment contracts. We fill this gap with theoretical results showing that even a modest amount of uncertainty can make all commitment contracts undesirable. Moreover, this modest amount of uncertainty will cause the harms from commitment contracts with penalties too low to guarantee behavior to increase in the degree of sophisticated present bias. These results highlight that it is the demand for commitment contracts and not the lack of demand that may be puzzling. They suggest that either commitment contracts are chosen in environments with little uncertainty or that people choose these contracts out of confusion.

We explore the second possibility by developing a simple reduced-form model of noisy choice that makes two novel predicts. First, the same people who take-up a commitment contract may

also take-up an *anti-commitment* contract, which are dominated contracts that *discourage* the target behavior. Second, de-biasing partially-naïve people should increase the perceived value of behavior change from piece-rate incentives but can *decrease* the demand for non-binding penalty-based commitment contracts.

We test these ideas using a field experiment with members of a fitness gym. We elicited subjects' willingness to pay for piece rates incentives for attending the gym, their desire to enter simple penalty-based commitment contracts and *anti-commitment* contracts, and their beliefs about how often they will attend the gym at varying levels of incentives. We then randomized subjects into different incentive levels for a one-month period. We also randomized some subjects to receive an information treatment at the start of the elicitation task aimed at de-biasing partially-naïve beliefs about gym attendance. Subjects show a positive average perceived value of changing behavior via piece-rate incentives and also strong take-up of commitment contracts. However, consistent with the model's predictions for noisy decisions, we find strong correlation between take-up of commitment and *anti-commitment* contracts. An information treatment was successful at partially reducing misprediction of future behavior. This de-biasing increased the valuation for behavior change via piece-rate incentives but *decreased* the demand for commitment contracts.

While our results suggest that the demand for commitment contracts does not reliably reveal awareness of present bias, we show theoretically that willingness to pay for piece-rate incentives can. Subjects' willingness to pay reveals robust evidence of at least some awareness of present bias. Moreover, we leverage these willingness-to-pay data to provide the first field estimates of both parameters of present bias and awareness of present bias.

The degree of misevaluation and noisiness in peoples' choice of commitment contracts suggests that they are not well-targeted and therefore likely not useful policy tools. However, our estimates of the degree of present bias imply that optimally set taxes and subsidies can lead to welfare improvements in the domain of exercise.