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Packaging of sin goods – Commitment or exploitation?☆

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ABSTRACT

We consider the shopping and consumption decision of an individual with a self-control problem. The consumer believes that restricting the consumption of a sinful product (such as chips) is in his long-run interest. But when facing the actual decision he is tempted to overeat. We ask how firms react to such self-control problems, and possibly exploit them, by offering different package sizes. In a competitive market, either one or three package sizes are offered. In contrast to common intuition, the large, and not the small package might be a commitment device. The latter may serve to exploit the naive consumer.

1. Introduction

Many individuals face self-control problems. The pleasure of the moment seduces them to act against their own long run interests. For example, they are tempted to shirk on unpleasant tasks – such as dieting. And a poor diet contributes to the problem of overweight and obesity. The World Health Organization reports that more than 1.4 billion adults were overweight in 2008, and more than half a billion obese. It estimates that at least 2.8 million people die each year as a result of being overweight or obese. Moreover, globally, 44 percent of diabetes, 23 percent of ischaemic heart disease and 7–41 percent of certain cancers are attributable to overweight and obesity.[1] The associated health costs are large (cf., e.g., Finkelstein et al., 2009).

Chandon and Wansink (2010) discuss how firms influence food intake with their marketing strategies and thereby may contribute to the problem of overeating. Examples of such marketing strategies are food prices and promotion, the food's quality and quantity, marketing, the availability, salience and convenience of food, the type, size and shape of serving containers, or the atmospherics of the purchase and consumption environment.

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[1] See http://www.who.int/features/factfiles/obesity/en/index.html (last accessed January 2014).

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In this paper, we want to focus on one particular marketing strategy – the packaging of sinful products such as chips. Wertenbroch (1998) argues that consumers engage in pre-commitment by rationing their purchase quantities, i.e., by buying, for example, small packages. Two questions arise from this. First, can the consumer indeed limit his consumption through such a strategy? And second, how do firms react to the consumer's self-control problem? The argument by Wertenbroch (1998) presumes that firms indeed offer small packages as commitment devices. But do they indeed do so or are they trying to counteract the consumer's wish for commitment?

To answer these questions, we consider the shopping and consumption decision of a vice, or sinful good (such as chips, cigarettes, or chocolate) of an individual that faces a self-control problem that arises due to time-inconsistent preferences. The individual judges that limiting the amount of, say, chips consumption is in his long-run interest. But once he sits in front of the TV and starts eating chips, the distant health benefits of a healthier life style suddenly do not seem worth the effort of restricting consumption.

The consumer goes shopping when he is not tempted to overeat. For example, when doing his weekly shopping trip, the consumer (self 0) has planned beforehand how much chips to buy and is not hungry. When sitting in front of the TV in the evening, however, the consumer (self 1) is tempted to overeat chips. The consumer can go shopping at this point, but, because of opportunity costs, the costs of such spontaneous shopping trips are higher than those of his weekly, planned shopping trip. We assume that the consumer is either sophisticated or naive, which means that the consumer, when doing his weekly shopping trip, is either fully aware or not at all aware that he faces a self-control problem.

Firms offer the consumer to buy a certain quantity (a "package") for a transfer. In the main model, we consider a competitive market. The sophisticated self 0 perfectly anticipates the shopping and consumption decision of his future self. Firms respond by offering self 0 either full or partial commitment. More precisely, if the shopping costs of self 1 are large, self 0 buys the package that is optimal from his viewpoint. In this case, self 1 is not tempted to go shopping again given the package self 0 bought and so the market can provide full commitment. If, however, self 1 would be tempted to go shopping again if self 0 bought the from his viewpoint optimal package, then only partial commitment is feasible. That is, firms offer a larger package to self 0 than is optimal from his perspective. Yet, self 0 buys this larger package because he knows that otherwise self 1 would go shopping again to buy a top-up. In contrast to the sophisticated self 0, the naive self 0 does not anticipate the decision of his future self. Hence, he goes shopping and buys the package that is optimal from his point of view. If the shopping costs of self 1 are sufficiently large, then self 1 will not go shopping. So in this case, self 1 will consume the package that is optimal from the point of view of self 0, i.e., the naive consumer receives full commitment. If, however, the shopping costs of self 1 are not sufficiently large, self 1 will go shopping again and buys a "top-up" package. So in this case, commitment breaks down.

The result yields several implications and testable predictions. First, we predict that commitment is easier to achieve if self 1 faces large shopping costs. There is some evidence that supports this result. Hinnosaar (2012) predicts that Sunday sales restriction decrease weekend consumption of alcohol. When looking at an actual policy change, Bernheim et al. (2012) however observe no such effect. Currie et al. (2010) observe that a close geographical proximity of a fast food restaurant is associated with higher rates of obesity (of children and pregnant women). Leung et al. (2011) show that the availability of convenience stores within a close distance of residence is correlated with a greater risk of girls becoming overweight or obese. Lee (2012) however finds conflicting evidence regarding the association between distance and overweight.

Second, the result predicts that in the competitive market, if the shopping costs of self 1 are large relative to those of self 0, one package size is offered, which is tailored to the interests of self 0. If the shopping costs at time 1 are relatively small, three different package sizes (a small one, a medium one, and a large one) are offered, and thus the market does not offer commitment to the naive consumers. Consistent with this result Steenhuis et al. (2010) observe that firms offer different package sizes. In contrast to common intuition, we demonstrate that the small package is not necessarily a commitment device, but can serve to exploit the naive consumer, while the large package may offer commitment to the sophisticated consumers. Indeed, for empirically reasonable values of the self-control problem, the smallest package is always the exploitative.

Third, in a competitive market, the naive consumer may go inefficiently often shopping. He initially buys a relatively small package that is optimal from the point of view of self 0 – believing that he will only consume this package, i.e., not go shopping again. But later, when in the "hot state", he buys another top-up package. Indeed, Hinnosaar (2012) observes that time-inconsistent consumers go shopping more often than time-consistent consumers. And Vermeer et al. (2011) provide field evidence showing that people having a smaller portion in the lunch cafeteria later are more likely to buy other food.

We contrast the competitive market with a monopolistic one. When facing a naive consumer, the monopolist tailors the package to the preferences of the self from whom he can extract the highest surplus. Thus, if the shopping costs of self 1 are large relative to the shopping costs of self 0, he caters to self 0 and perfect commitment is possible. If not, he caters to the interests of self 1 and offers a relatively large package. The sophisticated self 0 is willing to pay for a smaller commitment-package. The monopolist offers such (partial or full) commitment products to the sophisticated consumer – possibly at a higher price. Thus, in a monopolistic market, small packages are always commitment devices. So overall, our results make clear that a careful market analysis and assessment of the self-control problem are needed to assess whether small packages are commitment devices or are exploitative.

Comparing the monopolistic to the competitive market shows that for the sophisticated consumer only the distribution of rents differs, but the social surplus is the same in both markets. In contrast, the naive individual might be better or worse off in the competitive market. On the one hand, the competitive market provides more often full commitment to the naive consumer than the monopolistic market. However, if he does not receive full commitment, the social surplus in the