

# Micro Seminar

## Screening with Evolving Preference

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### 1 What is the question?

This paper talks about how private information on the evolution of preference interacts with the traditional short-term screening contract. Explicitly, there exists a contract between consumer and seller, so the problem is, how to improve future or current efficiency by drawing a contract? When we face some conditions, for instance, mixed revelation strategy, what should we do?

Asymmetric information on the evolution of preference preserves the consumer's future information advantage, but if you were seller how to maximize your utility?

### 2 Why should we care about it?

A consumer may encounter change in preference for goods that are determined periodically without long-term commitment. For example, magazine subscriptions or some lectures. Inevitably, consumers are not rich so they will change their preferences as time goes by. Maybe they will subscribe a expensive plan but somewhat subscribe a cheap plan after a year.

The model can help us to make precisely decision when we face similar situations. Also, it improves the future efficiency even exists mixed relevant strategy.

### 3 How does the author get there?

First, there are two types of consumers, which is consistent and inconsistent. Denote the marginal value of product at period  $t$  as  $v_t \in \{v_l, v_h\}$  with  $0 < v_l < v_h < \infty$ . If consumer is said to be consistent (denoted type C) if he has stable preference  $v_1 = v_2$ , while he is said to be inconsistent (denoted type I) if his preference differ in two periods  $v_1 \neq v_2$ .

The seller specifies consumption output  $q_t$  and associated payment  $p_t$  in the contract proposed at period  $t$ , denoted as  $\mathbb{C} = \{q_t, p_t\}$ , so it costs  $c(q_t)$  for the seller to supply  $q_t$ .

Second, following the backward induction, the seller propose a contract  $\mathbb{C}_k^i = \{q_{ti}^k, p_{ti}^k\}$ ,  $t = 1, 2$  which is current and future, and  $i = l, h$  which is consumer's message sent,  $k = C, I$ , which is consumer's type and consumer's choice of first-period option  $(q_{1t}, p_{1i})$  as  $v_k(v_h | v_i)$ . We should decided the second period first, that is

$$\varphi_{k2}^i : \max_{q_2, u_2} v_k(v_h | v_i)(v_h q_{2h} - c(q_{2h}) - u_{2h}) + (1 - v_k(v_h | v_i))(v_l q_{2l} - c(q_{2l}) - u_{2l})$$

subject to

$$u_{2l} \geq 0, \quad u_{2h} - u_{2l} \geq (u_h - u_l) q_{2l}, \quad q_{2h} \geq q_{2l}$$

The seller's first-period contracting problem give complete information on the evolution of preference is

$$\varphi_{k1} : \max_{q_1, u_1} \sigma(v_h q_{1h} - c(q_{1h}) - u_{1h}) + (1 - \sigma)(v_l q_{1l} - c(q_{1l}) - u_{1l})$$

subject to

$$u_{1i} \geq 0 \quad \forall i = l, h$$

and

$$(v_h - v_l)(q_{1h} - \mathbf{1}_I(q_{2l}^{Ih} - q_{2l}^{Il})) \geq u_{1h} - u_{1l} \geq (v_h - v_l)(q_{1l} + \mathbf{1}_C(q_{2l}^{Ch} - q_{2l}^{Cl}))$$

where  $\mathbf{1}_I = 1$  if the consumer is inconsistent, and  $\mathbf{1}_C = 1$  if the consumer is consistent. Denote  $\sigma \in \{0, 1\}$  be the probability that consumer has higher value in first period. With the method we can decide the suitable contract for the consumer.

## 4 What is the author's answer?

The author find with mixed revelation strategy, the optimal contract implements a higher probability to communicate truthful information when the agent's evolution of preference is his private information. To be more precisely, when the consumer is naive about his content of information on the evolution of preference, the consistent-high type and descending type of consumer suffers if he believes himself to be the minority while he is in fact one of the majority.

If the majority is consistent, the consistent-high type of consumer who naively believes to be inconsistent under-estimates his real second-period rent and thus under-estimates his ability. If the majority is inconsistent, the second-period information rent  $v_h$  in the first period is higher than  $v_l$ . So the descending type of consumer who naively believes to be consistent over-estimates his non-existent second-period rent following the truthful revelation in the first period and thus over-estimates the value of truthful revelation.