Efficient Sorting in a Dynamic Adverse Selection Model

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- Can we achieve efficiency in the adverse selection model where both restrictions of trading opportunities are removed at the same time?

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For $n = 0, \ldots, N$ and $m = n+1, \ldots, N+1$, a car of quality q_n depreciates to q_m (if $n < m \leq N$) or dies (if $m = N+1$) with probability $\gamma_{n,m}$ in every time period.

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The **simple depreciation** case corresponds to $\chi_0 = 1$ and $\gamma_{n,m} = 0$ for $m > n+1$.

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We assume that e is finite and large enough that consumers can potentially afford any quality they wish.

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The prices p_n that sustain the efficient allocation are defined by the expected present value of rental prices.

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The equilibrium strategies can be formulated as follows:

Consumer types $\theta \in [\theta_n^*, \theta_{n-1}^*)$ rent or buy vintage-n cars, and keep the same unit until it depreciates.

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(ii) If there are only two qualities, then there exists an ex-post efficient consumer equilibrium.

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Proposition 1 and Theorem 1$\Rightarrow$ if $n \geq 2$ there is no efficient consumer equilibrium under stochastic depreciation and resale.

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In contrast, if he buys a vintage $n+1$ car, he would still enjoy a quality q_{n+1} unit, but would only be able to sell it for p_{n+2}.

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Theorem 2 Under rental, there is a consumer equilibrium under asymmetric information that has the same allocation, strategies, and instantaneous rental prices as under observable quality.

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The efficent rental contracts must have indeterminate duration.

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A fraction y of firms produce each period. Active firms offer rental contracts at instantaneous prices $\{r_n(y)\}_{n=0}^{N}$. The remaining $1 - y$ firms are inactive.

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Not only the efficient sorting is achieved in equilibrium, but the first-best amount of output is supplied.

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For instance, highest-valuation consumers need to try several units before finding one of quality q_0.

It is impossible now to obtain the efficent allocation: the first consumer of the good consumes the ‘wrong’ quality with positive probability.

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(ii) Furthermore, as $\Delta \to 0$, cutoff types and instantaneous rental prices converge to their observable quality counterparts: $\theta_n \to \theta_n^*$ and $r_n \to r_n^*$ for all $n = 0, \ldots, N$.

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- Challenges of Rental Implementation:

- Agents could form a coalition to strategically return cars.

- Moral hazard is likely to be severe problem in rental.