Risk Adjustment, Self-Selection and Plan Design in Medicare Advantage

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Background

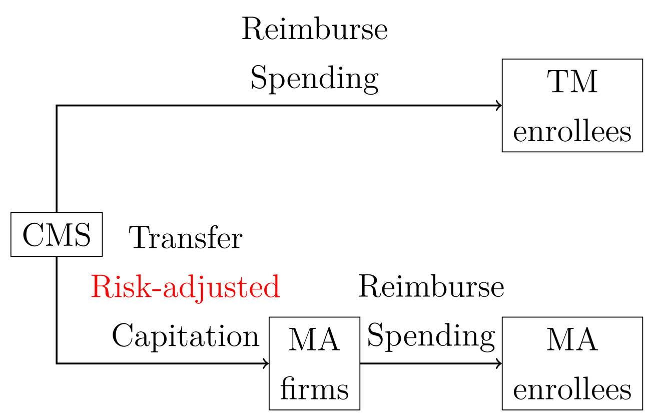

Figure: Medicare Market Illustration

Medicare is a U.S. federal health insurance program mainly for individuals aged 65 and older, comprising two main components:

- **Traditional Medicare (TM)**: A fee-for-service (FFS) system, typically paired with Medigap plans.
- **Medicare Advantage (MA)**: A managed competition framework where private insurers, subsidized by the government, often offer plans with **lower premiums and reduced generosity** compared to Traditional Medicare (TM).
- **Managed Competition**: The government provides fixed and predetermined subsidies to private insurance firms, which in turn offer insurance plans to beneficiaries.
- **Cream Skimming**: Firms strategically target healthier beneficiaries to maximize profits.
- **Risk Adjustment**: The government adjusts subsidy payments to insurers based on beneficiaries' observable characteristics.

Motivation

- **Self-Selection**: Beneficiaries make enrollment decisions based on their private information.
- Because of self-selection, the beneficiaries sharing the same risk adjusted subsidy payment may have different unobserved health perception, e.g. healthy beneficiaries perfer to enroll in plans with lower premiums and lower generosity, while sick beneficiaries perfer to enroll in plans with higher premiums and higher generosity.
- Current risk adjustment mechanism does not account for the self-selection effects, leading to the "cream skimming" incentives for MA firms to target healthier beneficiaries by strategically designing plans with lower premiums and lower generosity.
- Many literature has been devoted to the study of competition and selection in the context of Medicare Advantage, but attention to the self-selection under current risk adjustment mechanism is limited.

Goals

- **Theoretical**: Developed a managed competition model incorporating endogenous plan design and self-selection under private information.
- **Empirical**: Applied the model to Medicare Advantage data, evaluating the welfare implications of self-selection effects.
- **Policy**: Provided insights for enhancing risk adjustment payment policies to mitigate market distortions.

Method

- Develop a structural model of demand and supply that incorporates self-selection and endogenous plan design.
- Estimate the model using Medicare Advantage data.
- Conduct counterfactual simulation to analyze scenario where self-selection effects are neutralized.

Results

Demand Estimation Results

Table: Estimation Results of Consumer Preference Heterogeneity

Variable	Parameter	Estimate	Std Error
Generosity Preference			
Health Perception	γ	0.115	(0.052)
Premium Preference			
High Income Level	ρ^{inc}	-0.473	(0.248)
MA Type Preference			
High Education Level	ρ^{edu}	-0.275	(0.203)
White Race	ρ^{white}	-0.173	(0.280)
Medicaid Coverage	ρ^{Mcd}	0.039	(0.244)
ESI Coverage	ρ^{ESI}	-2.543	(0.404)
Private Information Distribution			
SD of Health Perception	σ_τ	3.983	(2.733)

Note: ESI stands for employer-sponsored insurance.

- The private health perception is the most important factor in determining the plan choice over the generosity preference.
- For beneficiaries sharing the same risk adjusted subsidy payment, the private health perception could be very different.

Supply Estimation Results

Table: Estimation of Plan Marginal Cost

	I		II	
Variable	Estimate	Std Error	Estimate	Std Error
Coverage				
Generosity	1.353	(0.171)	1.367	(0.174)
Generosity^2	0.160	(0.020)	0.140	(0.021)
Network				
Rating (per star)	0.150	(0.019)	0.157	(0.020)
HMO	0.237	(0.022)	0.247	(0.023)
Additional Benefits				
Dental	0.170	(0.023)	0.158	(0.025)
Vision	0.039	(0.055)	0.045	(0.055)
Hearing	0.095	(0.026)	0.118	(0.027)
Firm Fixed Effect				
Aetna	-	-	-0.017	(0.033)
Anthem	-	-	-0.181	(0.049)
UHG	-	-	-0.079	(0.030)

- The generosity of the plan is the most important factor in determining the cost of the plan.
- The marginal cost increase non-linearly with the generosity of the plan, suggesting that the self-selection effects.
- Because of the self-selection effects, a high generosity will attract beneficiaries with bad health

Counterfactual Simulation

Table: Welfare Comparison Between Current and Equal-Profit Risk Adjustment

Metrics	Current	Equal-Profit	% Change
Total MA share (%)	30.58	33.25	8.72%
Total Consumer Surplus	22.08	24.51	11.01%
Total Producer Surplus	14.45	19.45	34.60%
Gov Spending on TM	370.26	357.46	-3.46%
Gov Spending on MA	163.51	176.31	7.82%
Subsidy Adjustment	-	0.95	-
Total Gov Spending	533.77	534.72	0.18%

Note: The monetary values are in billion dollars. The subsidy adjustment is the change in the total capitation payment from the government to MA firms, compared to the current policy. The total government spending is the sum of government spending on TM and MA.

Takeaways

- Conventional risk adjustment mechanisms do not fully eliminate cream-skimming incentives, leading to market distortions and welfare losses.

References