Introduction

- Lots of interest has focused on creation and regulation of health insurance markets (exchanges)
  - A¤ordable Care Act (ACA) in United States (2010)
  - Netherlands (2006), Switzerland (1996), Private market in Germany
  - Private employer exchanges GermTem42l89 0 Td [(Germa)-1(n)1(yrm

Introduction

Current Debate in Congress

- Ongoing work in US congress replacing the ACA
  - (some) relates to market rules
  - proposals by di¤erent Republicans
    - Better Way: Paul Ryan, Patient Care Act: Orrin Hatch, Empowering Patients First Act: Thomas Price, Health Care Choice Act: Ted Cruz, Healthcare Accessibility, Empowerment, and Liberty Act: William Cassidy and Peter Sessions
- All proposals include repealing participation mandate
  - mandate intended to prevent market unravelling
  - but perceived as infringing freedom
- Some proposals remove ban on pricing of pre-existing conditions

- Market design (rules) needed to contend with two potential problems:
  - or two risks: i. type (conditions), ii. medical costs given type

1. Reclassi...cation risk (RR)
   1. if health conditions priced
   2. individuals face risk of changing health type
      - leading to potentially high premiums at bad times
2. Adverse section (AS)
   1. if charged average premiums, healthy individuals may opt out, leading to premium increase...
   2. standard Akerlof lemons ine¢ ciency
   3. may even lead to the collapse of the market

Introduction

Main Economic Issues

- Tension between: AS and RR
- AS can be contended with by pricing of health condition
  - individualized prices (rather than average) can eliminate adverse selection
  - less adverse selection, implies more trade, higher welfare
- But pricing health conditions leads to more premium uncertainty
  - exacerbating RR, lowers welfare
- Relates to notion of insurance
  - two risks

Introduction

Main Economic Issues: Types of Contracts

- Most regulations stipulate one-year contracts
- Longer contracts, as in private German HI market, might improve welfare
- Long-term contracts might:
  - eliminating AS through health based pricing
  - while insuring RR through commitment to future policy terms
- Policy

Introduction

Main Economic Issues: Repeal and Replace

- All Republican proposals eliminate the mandate
  - there is no penalty for not participating
- Instead they propose:
  - penalties while returning to the market
    - House of Representatives bill: 30% penalty for non-continuous coverage
    - Senate bill penalizes with 6 months exclusion when back
- Both alternatives, to enhance participation, create dynamics:
  - although contracts are yearly
  - current consumer behavior a¤ects future payo¤s
  - thus, …nding demand and equilibrium, entails a DP problem
- Policy question: problemequ1Tf1.69of()Tj/TT01Tf3.6960Td[(pa)273

Market Design

Data Requirements for Simulations

- One can simulate equilibria and compute welfare, in all 3 set -ups:
  - one period contracts with di¤erent pricing rules
  - one period contracts with rules generating demand dynamics
  - long term contracts
- Data needed:
  - distribution of health types ("health state")
    - distribution of costs given types
  - health state transitions (from year to year)
  - preferences toward risk (parameter)

Data

Data

- We treat the large employer as the population in the exchange
- Having an ACG score for each person, we basically observe distribution of risk types
  - the distribution of types is data, rather than estimated
- Use ACG changes over time to estimate health transitions
- Estimate distribution of realized medical costs given ACG
  - re‡ects uncertainty faced by each type
- Risk preferences
  - Choice Model in Handel, Hendel, Whinston (2015)
  - Comparable choices in the literature: Collier et al. (2017)

From the Data to the Simulations

Ingredients

- For each person in population we know:
  - risk type (ACG)
  - estimated risk preference (CARA parameter)
  - estimated distribution of costs given ACG (uncertainty faced)
- With: type, uncertainty and risk preferences
  - compute expected utility from an insurance policy with Actuarial Value (AV) x: EU_x ACG
- Knowing expected utility, we get willingness to pay for any level of coverage as:
  - e.g., WTP for a 60% policy is: θ_{60} EU_{60} ACG $\square$ EU_0 ACG
- Compute WTP for every person in the population (given their ACG and age)
  - which represents demand for such policy

Population Health Costs

Sample Total Health Expenditure Statistics				
Ages	Mean	S. D.	S. D. of ACG	S. D. around ACG
All	6,099	13,859	6,798	9,228
25-30	3,112	9,069	4,918	5,017
30-35	3,766	10,186	5,473	5,806
35-40	4,219	10,753	5,304	6,751
40-45	5,076	12,008	5,942	7,789
45-50	6,370	14,095	6,874	9,670
50-55	7,394	15,315	7,116	11,092
55-60	9,175	17,165	7,414	13,393
60-65	10,236	18,057	7,619	14,366

Population Health States

AGE:	Health States:						
	1	2	3	4	5	6	7
25-30	0.49	0.19	0.14	0.07	0.04	0.03	0.04
30-35	0.41	0.18	0.13	0.08	0.06	0.06	0.07
35-40	0.27	0.30	0.13	0.06	0.09	0.07	0.09
40-45	0.19	0.28	0.16	0.09	0.12	0.08	0.10
45-50	0.01	0.15	0.32	0.15	0.13	0.12	0.12
50-55	0.00	0.10	0.25	0.19	0.15	0.16	0.15
55-60	0.00	0.01	0.01	0.25	0.24	0.28	0.22
60-65	0.00	0.00	0.00	0.18	0.24	0.26	0.31

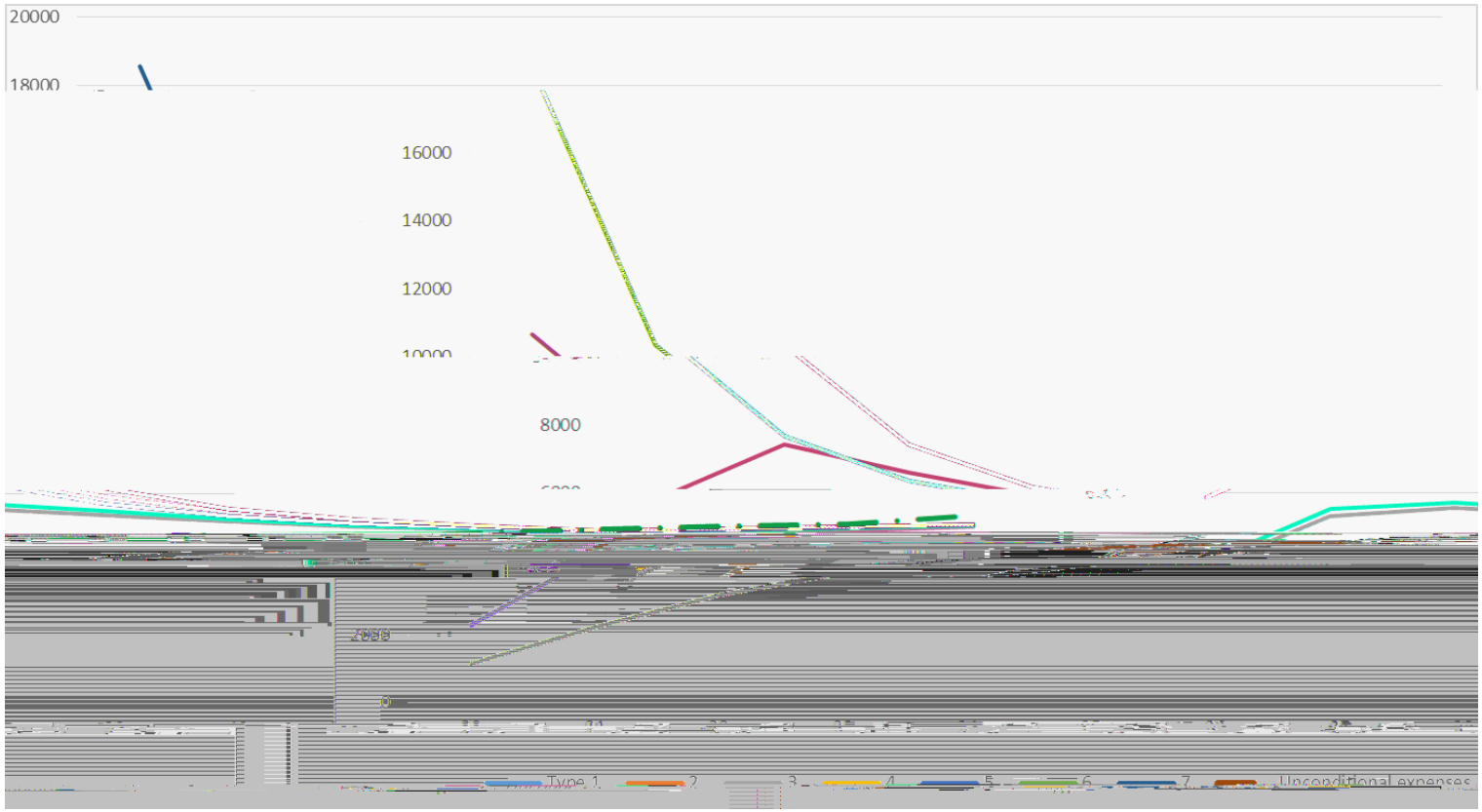
Health State Transitions: 30-35 year olds

		$\lambda_{t\ 1}$						
		1	2	3	4	5	6	7
	$\lambda_t = 1$	0.72	0.13	0.05	0.05	0.02	0.01	0.03
	$\lambda_t = 2$	0.35	0.25	0.12	0.11	0.04	0.03	0.11
λ_t	$\lambda_t = 3$	0.15	0.23	0.19	0.15	0.10	0.08	0.10
	$\lambda_t = 4$	0.20	0.08	0.12	0.24	0.18	0.12	0.08
	$\lambda_t = 5$	0.10	0.10	0.05	0.20	0.20	0.20	0.15
	$\lambda_t = 6$	0.16	0.11	0.14	0.11	0.08	0.22	0.19
	$\lambda_t = 7$	0.11	0.11	0.07	0.04	0.11	0.20	0.37

Health State Transitions: 50-55 year olds

		$\lambda_{t\ 1}$ = 1	2	3	4	5	6	7
	$\lambda_t = 1$	0.67	0.15	0.10	0.02	0.02	0.01	0.03
	$\lambda_t = 2$	0.25	0.37	0.20	0.09	0.04	0.02	0.04
λ_t	$\lambda_t = 3$	0.09	0.21	0.21	0.20	0.12	0.10	0.08
	$\lambda_t = 4$	0.10	0.19	0.26	0.12	0.10	0.19	0.05
	$\lambda_t = 5$	0.09	0.19	0.14	0.15	0.10	0.19	0.15
	$\lambda_t = 6$	0.00	0.09	0.13	0.09	0.19	0.23	0.28
	$\lambda_t = 7$	0.03	0.10	0.10	0.10	0.21	0.16	0.29

Health State Persistence starting at age 30



From the Theory to the Simulations

Solution Concepts

PART I

One-period Contracts: Pricing Rules

Part I: One-Period Contracts

Handel, Hendel and Whinston (2015)

- We …nd that markets fully unravel if only age is priced
  - like in the ACA
- We estimated: cost of AS (namely, of underinsurance) under Obamacare (ACA) is about $600 per person/year
- If health conditions are priced
  - trade increases, some individuals get high level of coverage (90% Actuarial Value)
  - so AS is reduced (but in a very limited way)
- Downside: premiums become uncertain (over time), creating RR
  -

All	35.2	0	0	0

PART II

Long-Term Contracts

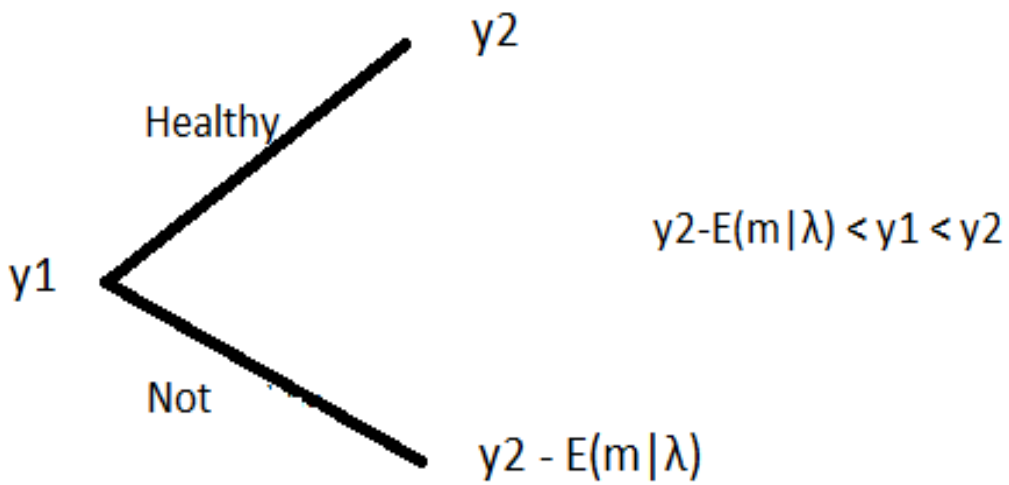
Part II: Long Term contracts: One Sided Commitment

Handel, Hendel and Whinston (2017)

- Firms can o¤er long term contracts
  - like in German private health insurance market or US life insurance
- Consumers can lapse any time, without termination fees
- Competitive equilibrium maximizes consumer welfare, breaking even ex-ante
  - o¤ering contracts that are “lapsation-proof”

Simplest Example

One Sided Commitment: 2 periods, 2 (second period) states



Model

Handel, Hendel and Whinston (2017): Set up

- T periods, U $E\left[\sum_t \delta^t u(c_t)\right]$
  - T = 40, from age 25 to 65 (Medicare)
- Individual income in period t: y_t
- Health state λ_t (ACG), summarizes expected health costs, $E(m_t|\lambda_t)$
- Health expenses m_t and λ_{t+1} determined by density $f_t(m_t, \lambda_{t+1}|\lambda_t)$
  - the transitions just showed youcome

Health State Transitions: 30-35 year olds

		$\lambda_{t\ 1}$						
		1	2	3	4	5	6	7
	$\lambda_t = 1$	0.72	0.13	0.05	0.05	0.02	0.01	0.03
	$\lambda_t = 2$	0.35	0.25	0.12	0.11	0.04	0.03	0.11
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	$\lambda_t = 6$	0.16	0.11	0.14	0.11	0.08	0.22	0.19
	$\lambda_t = 7$	0.11	0.11	0.07	0.04	0.11	0.20	0.37

Elements from Data

Simulating Equilibrium Contracts and Welfare

- The key ingredients are: health status and transitions over time, risk preferences
- Age dependent annual transitions across a 7 health-state partition (using 5-year bins)
- We use estimated risk preferences from HHW (2015) choice model: CARA with population mean $\gamma_j = 4.39 \square 10^{\square 4}$
- δ 0.975

- With those parameters, …nd optimal contracts, and welfare

Risk Aversion:

CARA coe¤ 0.00008

	Certainty Equivalent			
Income	$C_{NB}^{\square}$	CE_S	CE_D	CE_{ACA}
Flat-net	53.67	52.47	53.62	52.85
Manager	47.20	46.41	46.94	46.80

Switching Costs

Welfare Impact: CARA

PART III

One-period contracts: Republican's

Part III: Republican Reform

Static Contracts with Consumer Dynamics

- Ghili, Hendel and Whinston (2017) go back to static contracts
  - …rms o¤er one-period contracts
  - with no pricing of health conditions
  - but penalties for lack of continuous coverage
- Simulate:
  - House of Representatives proposal: 30% premium increase for returning buyers
  - Senate proposal: 6 months without coverage, EU_0 ACG
- Unlike the mandate, both options generate consumer dynamics

Part III:

Equilibrium premiums

- For a given p we …nd $V_a(\lambda, \chi, p)$
- $V_a(\lambda, \chi, p)$ and p determine participation and insurer's cost for every a
- Update p such that insurers break for every a
- Update $V_a(\lambda, \chi, p)$ for new p
- Iterate
  - not a contraction, need not converge, it did so far
- Equilibrium involves: consumers optimizing and …rms breaking even

Concluding Remarks

- Plenty can be simulated
- Treating health insurance policies as …nancial instruments
  - non-…nancial components can be accommodated
- Using data …rms are increasingly willing to share (e.g., Alcoa, Microsoft)
- Ideally, governments would be willing to collect and share
- ACG software extremely useful
  - replacing parametric assumptions in prior literature with data
  - same data/information used by market participants