

Econ 191: Background material for Prof. Handel's Lecture on Health Insurance

Owen Zidar

University of California, Berkeley

owenzidargsi@gmail.com

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Overview of Today's Lecture

① Brief Tutorial on model building

- ① **Example:** Discrimination
- ② **Framework:** Olney method of thinking like an economist

② Background for Ben Handel Lecture

- ① **Motivation:** Why should we care about healthcare?
- ② **Tools:** Review of Choice under Uncertainty
- ③ **Theory:** Market for Lemons (Akerlof 1970)
- ④ **Market for Health Insurance:** Policy issues in a graph

What is a model?¹

- **Who** are the people making the choices?
- What are their **objectives**?
- What **choices** are they making to advance those objectives?
- What are the **constraints** they face?
- How do they **interact**?
- What **adjusts** if the choices aren't mutually consistent?

¹From Hal Varian: <http://people.ischool.berkeley.edu/~hal/Papers/how.pdf>

Overview

- **Observation:** Data show women earn less than men even after controlling for age, occupation, and education.
- **Hypothesis:** The male-female wage gap is due to taste based discrimination among employers
- **Method:** Use the following model to arrive at testable empirical predictions

Example: Discrimination in Labor market

Setup²

- Employers and two types of workers (Men and Women)
- Employers maximize utility
- Men and women are perfect substitutes
- Wages adjust to clear the labor market

²This is a basic version of Becker's 1957 model of taste based discrimination

Example: Discrimination in Labor market

Employer problem

$$\max_{N_m, N_w} u(N_m, N_w) = \underbrace{pF(N_m + N_w) - w_m N_m - w_w N_w}_{\text{Profits}} - dN_w \quad (1)$$

- p is the price of the good the firm is selling (say $p = 1$)
- N_m and N_w number of men and women hired respectively
- w_m and w_w are wages
- $F(N)$ is a concave production function
- d is a discrimination factor that differs over employers with cdf $G(d)$

Example: Discrimination in Labor market

Employer problem: FOCs

$$F'(N_m) = w_m \quad (2)$$

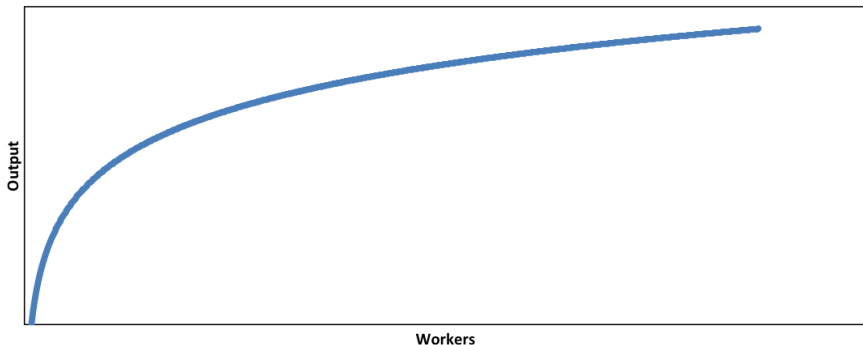
$$F'(N_w) = w_w + d \quad (3)$$

What do these FOCs look like?

$$F'(N_w) = w_w + d$$

$$F'(N_m) = w_m \quad (4)$$

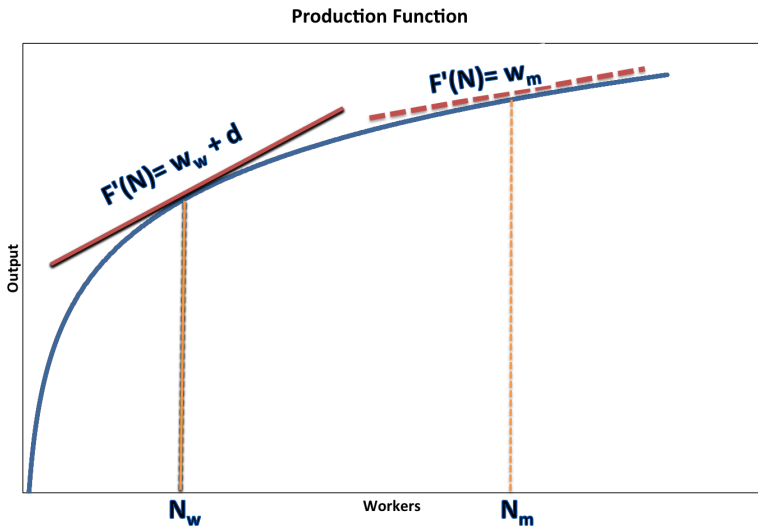
Production Function



What do these FOCs look like?

$$F'(N_w) = w_w + d$$

$$F'(N_m) = w_m \quad (5)$$



Example: Discrimination in the Labor market

Demand

$$L^d(w_m, w_w, G(d)) \quad (6)$$

Supply

$$N_i^s(w_i) \quad (7)$$

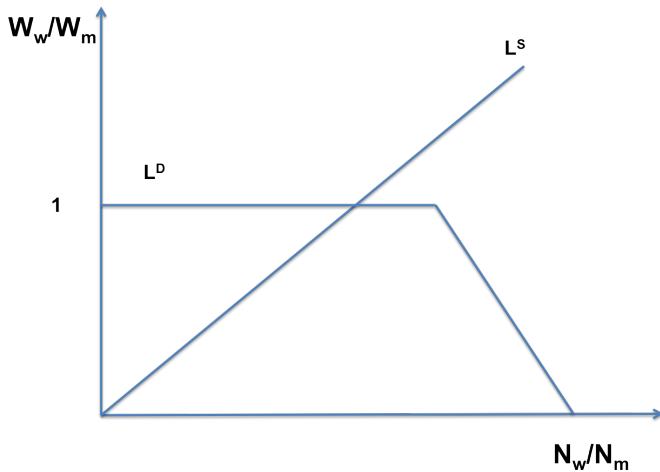
Equilibrium

$$\underbrace{N_m^s(w_m) + N_w^s(w_w)}_{L^s(w_m, w_w)} = L^d(w_m, w_w, G(d)) \quad (8)$$

Note $w_w < w_m$ iff the fraction of discriminating employers is sufficiently large

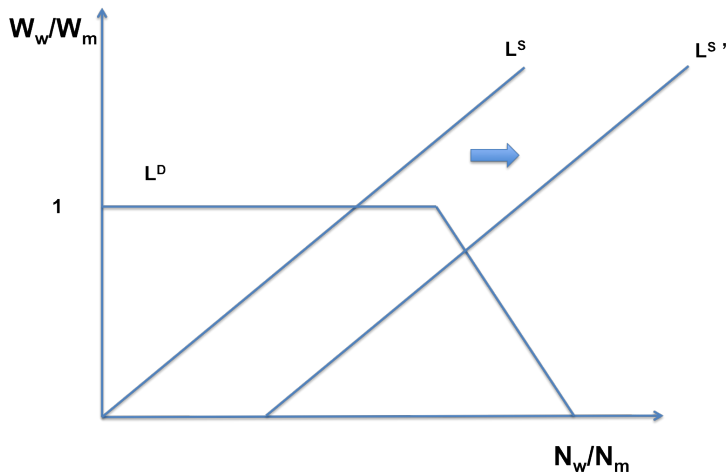
Labor market with Discrimination

No wage gap case



Labor market with Discrimination

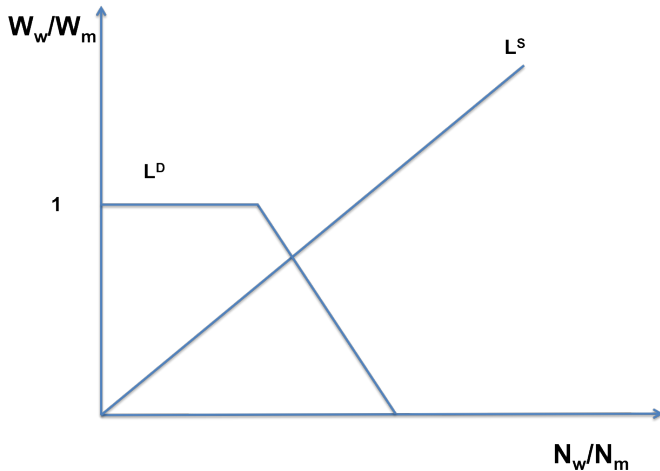
More women \Rightarrow wage gap



Intuition: Who is the marginal employer?

Labor market with Discrimination

Fewer non-discriminatory employers \Rightarrow wage gap



Intuition: Who is the marginal employer?

Conclusions from the model

- ① We can get nice comparative statics about the effects of increases in female workers, discrimination among discriminators, & employer exits on the magnitude of the wage gap
- ② **Short Run** Increased supply or shifted demand will alter marginal employer (whose d determines wage gap)
- ③ **Long Run** Discrimination is unprofitable and in a version of this model with CRS production, there will be no discrimination (since it is not a sustainable business strategy)

How to think like an economist/improve a model³

- 1 Replicate argument
- 2 Identify assumptions
- 3 Change one of these assumptions
- 4 Use logic to determine new conclusion
 - 1 If same conclusion, go back to step 3
 - 2 Different conclusion
- 5 Verify empirically or argue rhetorically⁴

³From Martha Olney (UC Berkeley)

⁴The most interesting arguments have first order implications (in the sense that the conclusion materially changes under the new assumption)

IB. Using the Olney Method

What are some assumptions we can change from the Becker model?)

- Change $G(d)$
- Employers with market power
- Consumers rather than employers discriminate

Goal: Better explain and understand what we see in the world by refining our models using this type of process

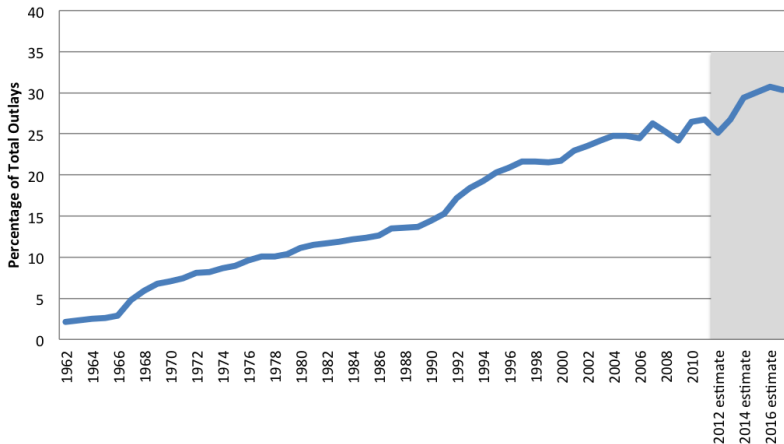
Why should we care about healthcare?⁵

- ① Moral and Social Issue
- ② Size: more than 10% of Labor Market and nearly 1/5 of GDP
- ③ Scope: cost and availability of health insurance also impacts every other industry
- ④ Budget

⁵Points from Christina Romer's speech entitled "THE CHALLENGES OF ECONOMIC POLICYMAKING: THE CASE OF HEALTH CARE REFORM"

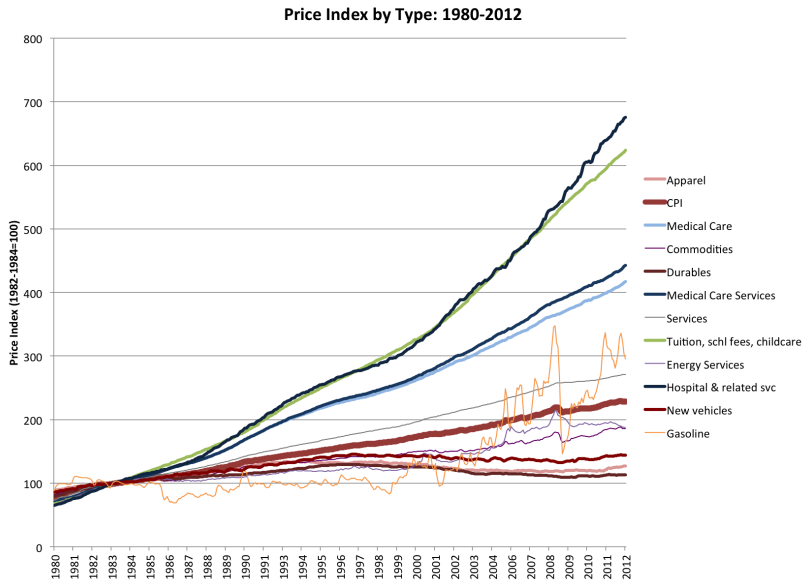
II. Healthcare Budget⁶

US Government Health Program Spending



⁶From OMB Historical Tables 16.1

II. (Relative) Price of Healthcare Increasing (3/3)



II. Health insurance markets

To study health insurance markets and policy, we first need some tools/theory

- ① Review of Choice under Uncertainty
- ② Market for Lemons (Akerlof 1970)

Where we are going:

- Competitive insurance equilibrium may not be efficient (sub-optimally low insurance coverage)
- Potential welfare gains from government intervention in private insurance markets (mandates, subsidies)
- In which situations do these policies make sense? When do they make things worse?

IIB. Choice Under Uncertainty⁷

	Payoff	Probability
Lottery 1:	\$100	0.5
	0	0.5

	Payoff	Probability
Lottery 2:	\$70	0.5
	\$30	0.5

⁷Materials in this section based on David Card's 101 Lecture:
http://emlab.berkeley.edu/users/cle/e101af12/LectureNotes_0120818.pdf

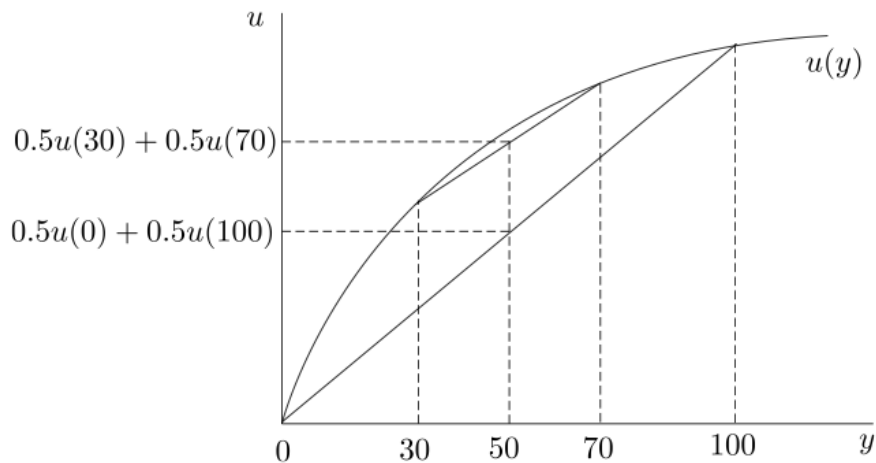
IIB. How do we rank these lotteries?

1940s: John von Neumann and Oskar Morgenstern's solution

$0.5 \times u(100) + 0.5 \times u(0)$ in case of Lottery 1

$0.5 \times u(70) + 0.5 \times u(30)$ in case of Lottery 2

IIB. What does this look like?



IIB. Is this true for all risk preferences?

- ① Risk Averse
- ② Risk Neutral
- ③ Risk Loving

George Akerlof and sushi:⁸ I was having sushi with George a few years ago. Specifically, we were at a sushi boat restaurant sitting at the bar eating off of the boats floating by. All of a sudden George looks around the room, sees lots of Japanese tourists eating at the other end of the bar, right where the chef puts plates on the boats. He concludes that we really should be ordering from the menu and not be eating anything that comes by anymore.... **Why?**

⁸from Botond Kosegi's lecture notes

Why do used cars sell at a discount?⁹

- Large price difference between new cars and those which have just left the showroom
- Suppose 4 types of cars. New and Used. Good and Bad (i.e. lemons).
- Probability p its a new car is good.
- Owning the car for a length of time gives them a good idea if its a lemon.
- An Asymmetry in information has developed

⁹From Akerlof (1970)

IIC. Akerlof & the market for lemons

An Asymmetry in information has developed: sellers know more about quality than buyers. **So what?**

- Good cars and bad cars must still sell at the same price since its impossible for buyers to tell the difference
- Used cars also can't have same valuation as new cars (because owners of lemons would just trade a lemon at the price of a new car and buy a new one)
- Thus, owners of good machines are locked in.
- Not only can owners of good cars not receive the true value of their cars, but can't even get the expected value of a new car.

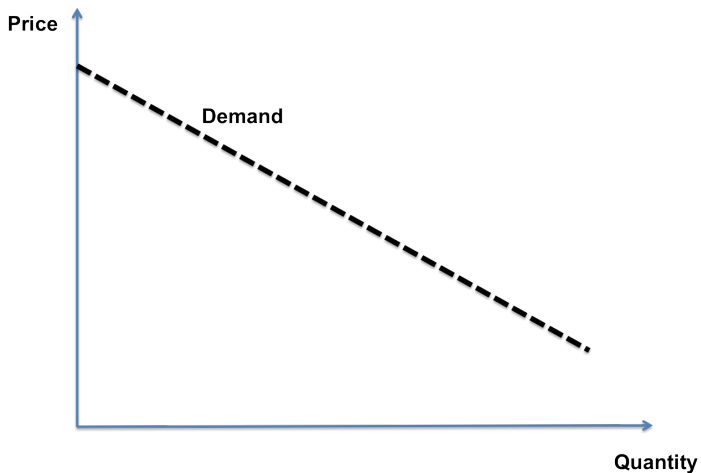
Demand for Health insurance¹⁰

- Suppose 100 identical people pick a number out a hat corresponding to how sick they will become
- Based on the number each person drew, they decide the most they are willing to pay to buy a health insurance plan

¹⁰This section is based on the new PF handbook chapter on social insurance by Raj Chetty and Amy Finkelstein

IID. Health insurance markets

Demand for Health insurance

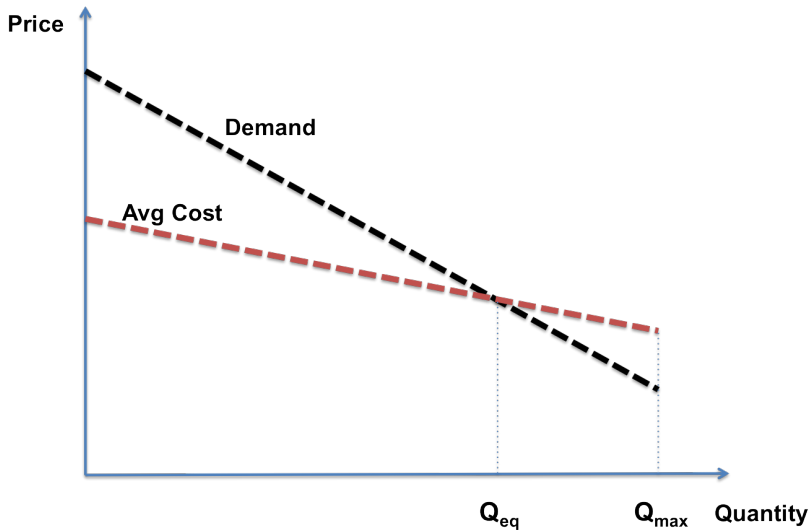


Supply of Health insurance: Firms

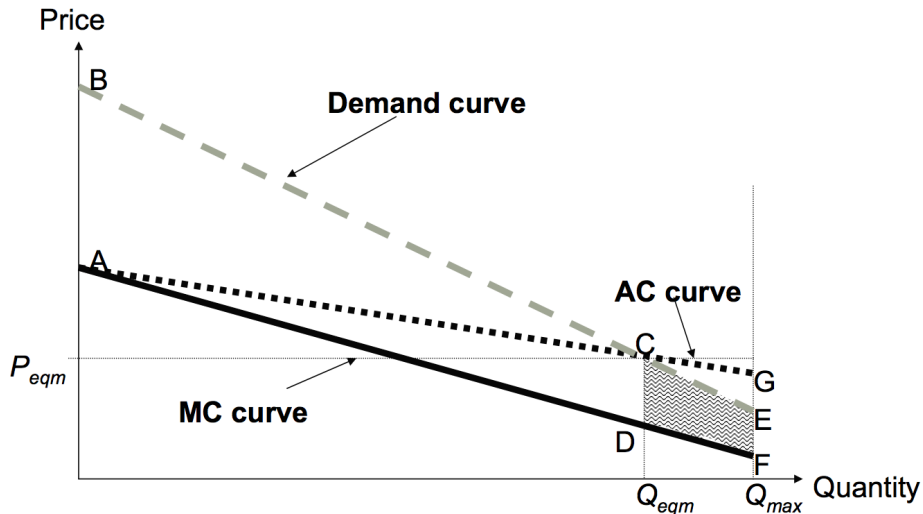
- Firms don't know what number people drew/have to charge everyone the same price
- To break even, they have to charge their average cost, AC, for each plan
- Importantly, their average cost may change if they sell more plans
- A key issue is whether AC goes up or down when they sell one extra plan

IID. Health insurance markets

Supply of Health insurance: Firms



IID. Health insurance markets¹¹



¹¹Source: Finlay and Finkelstein (2011)

IID. Health insurance markets

"The distinguishing feature of selection markets is the demand and supply curves are tightly linked since the individuals risk type not only affects demand but also directly determines cost."

Classic public policy interventions:

- Mandates
 - Can achieve efficient outcome
 - Unambiguous welfare gain but magnitude an empirical question
- Subsidies
 - Optimal level of subsidy must consider cost of public funds

How to think like an economist/improve a model¹²

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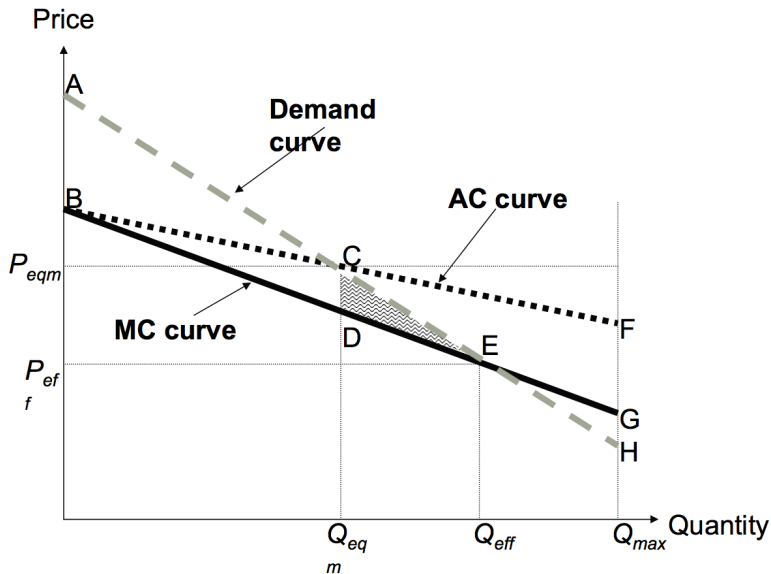
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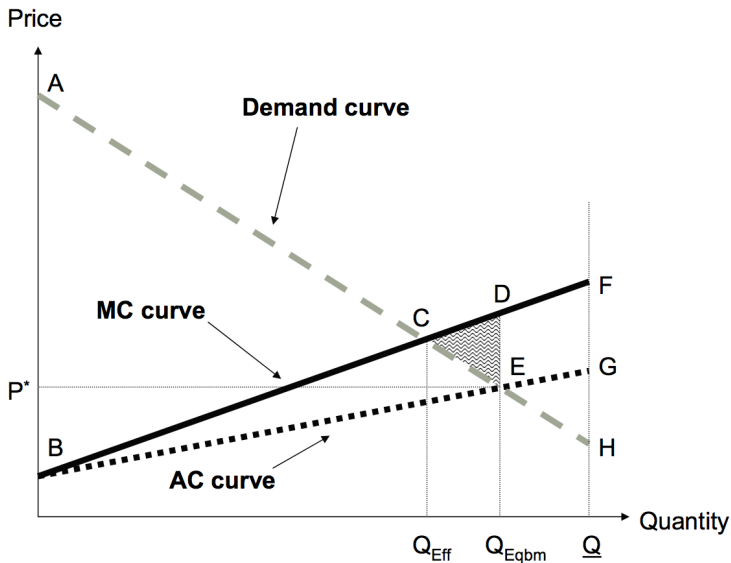
Alter assumptions of the model. Suppose instead that:

- 1 Insurers have administrative costs that shift AC up
- 2 Consumers demand for health insurance is determined not only by their unobservable draw for how sick they expect to be, but also by their preferences for risk

What if you have to cover admin costs?



What if risk preferences give you advantageous selection?



Overview of Today's Lecture

Recap

- 1 Classic case: under provision and social surplus from mandates
- 2 Admin costs: under provision, but mandates may be excessive
- 3 Advantageous selection makes theory less clear
- 4 Need for empirical evidence becomes more important

Professor Handel on Health Insurance