Introduction

- In many transactions, one or more parties has *private information* about relevant characteristic
- *Examples* (bilateral transactions, one side knows more than other):
  - used car market
  - insurance market
  - labour market
  - within a firm
  - government regulation of natural monopolists
  - redistributive taxation
- In these examples, if information were symmetrically distributed, terms of transaction would vary with information.
- If information is asymmetrically distributed, can the terms of trade vary with the information?
  - difficulty: If uninformed party asks informed party to reveal information, informed party may not have incentives to do so truthfully.
- Markets with hidden information may break down:
  - Akerlof's model of the market for 'lemons' (QJE, 1970)

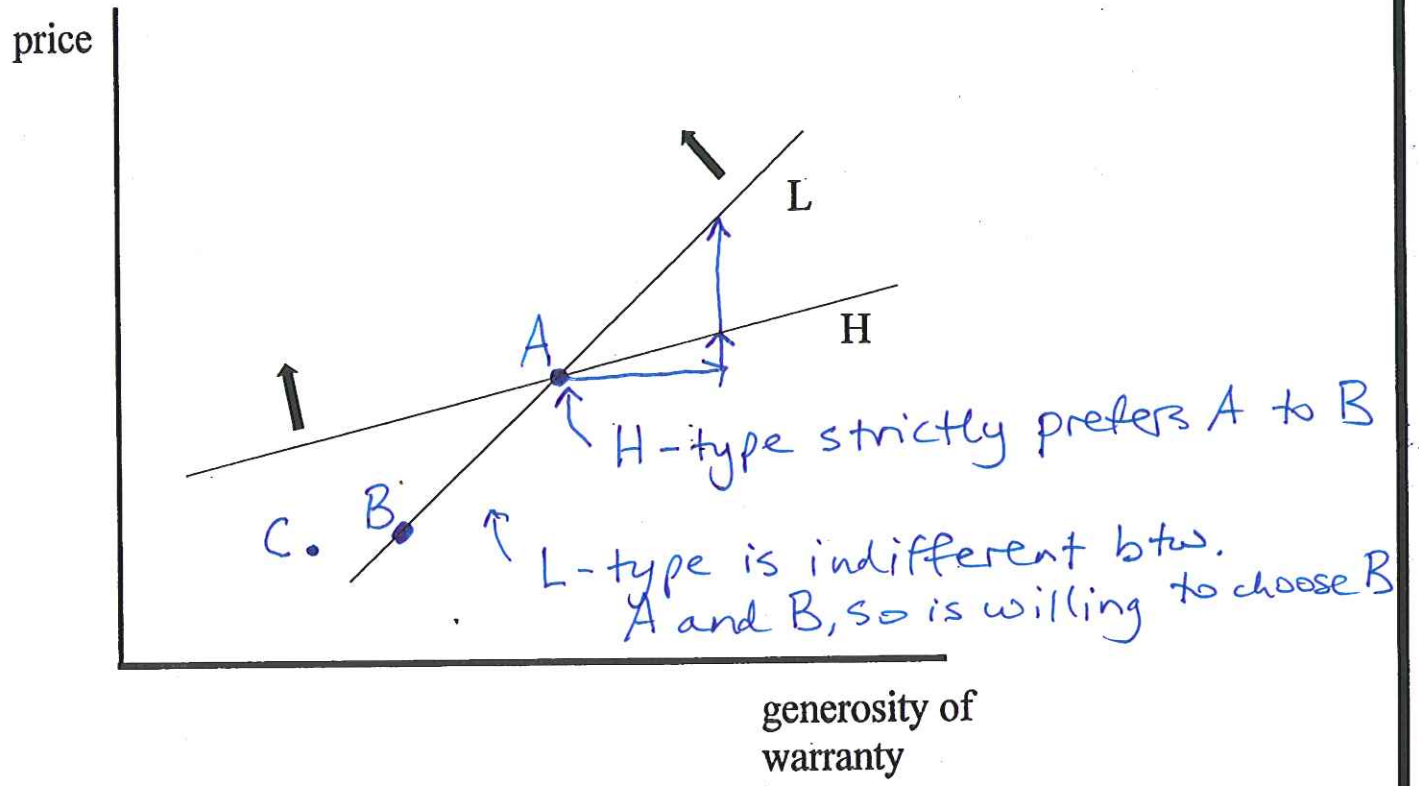
Used car market (stylized example)

- Assumptions:
  - $\frac{1}{2}$ of used cars are *bad*; $\frac{1}{2}$ are *good*
  - sellers can observe quality; buyers cannot
  - buyers value good cars at 6; bad cars at 2
  - sellers value good cars at 5; bad cars at 1
- For comparison:
  - If *both* parties could observe quality, good cars would sell for $p_G \in [5,6]$, bad for $p_B \in [1,2]$.
  - If *neither* buyers nor sellers could observe quality, all cars would sell for $p \in [3,4]$.
- When buyers cannot observe quality, all cars must sell for the *same* price.
  - If $p \geq 5$, sellers of both types of cars offer them for sale. But buyers, knowing that $\frac{1}{2}$ are bad and $\frac{1}{2}$ good, are not willing to pay more than 4.
  - If $p \leq 4$, sellers of good cars are not willing to offer them for sale.
- Market equilibrium: only bad cars offered for sale, $p \in [1,2]$.
  - market 'unravels'; good cars withdrawn
  - equilibrium inefficient; gains from trade in good cars are not realized

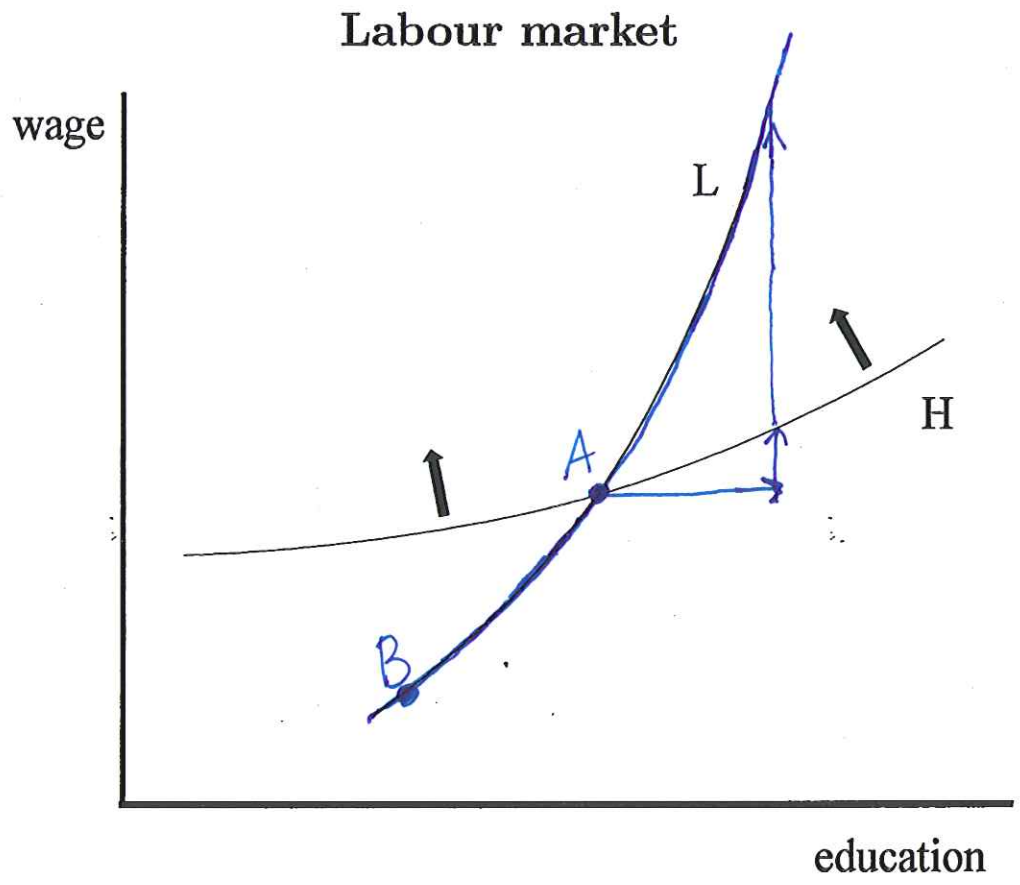
Adverse selection

- Markets with hidden information can result in 'adverse selection'
  - *examples*: used car market; life/health insurance market
- But in many markets/transactions, participants find ways to mitigate the undesirable consequences of asymmetric information
  - they find ways for privately-informed individuals to *self-select*
  - basic idea: not all transactions need occur at same price; price vary with other component
- Examples
  - used car market: price can vary according to whether or not seller offers warranty
  - insurance market: premium can be lower if customer accepts restrictions on benefits paid
  - labour market: wage can vary with worker's educational qualifications
  - regulation: price charged by firm can vary with lump-sum subsidy firm receives
- Privately-informed individuals with different characteristics ('of different types') will have different preferences over available options; that is, indifference curves will have different slopes.

Used car market

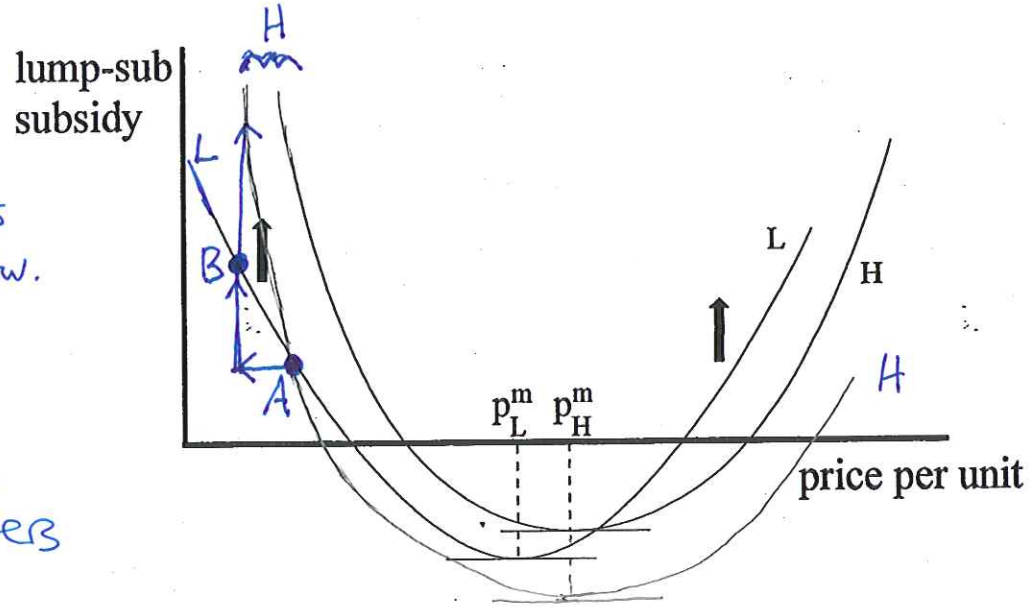


- Sellers of high-quality cars will find offering an improvement in warranty terms less costly than sellers of low quality cars.



- Workers of high ability may find a given increase in educational qualifications less costly (in terms of effort) than workers of low ability.

Regulation



L-cost firm is indifferent btw. A and B

H-cost firm strictly prefers A to B

- At prices less than p_L^m, a firm with low marginal costs will find a given reduction in price less costly than a firm with high marginal costs.

Game-theoretic analysis

- The natural extensive-form game depends on the setting:
  1. Optimal contracting (mechanism design): uninformed party commits to contract offering a menu of choices; privately-informed party chooses most attractive option.
     - *examples*: regulation, taxation, incentive schemes
     - optimal contracting analysis can be extended to deal with several interacting, privately-informed parties; *examples*: auctions; cartels; public-goods provision
  2. Signalling: privately-informed party chooses signal; uninformed party chooses response action
     - *examples*: education; warranty
  3. Screening: uninformed parties make offers; privately-informed parties choose between offers
     - *example*: insurance policies
- Equilibrium outcomes: self-selection may arise in equilibrium, so terms of transactions vary with types. But outcomes may still be inefficient relative to outcomes under full information:
  - *examples*: high-ability workers may over-invest in education; regulated price for high-cost firms may be above marginal cost
  - also, equilibrium may not exist (in cases of screening, markets may be unstable)