

MARKET FAILURE

Topic: **Informational Failures**

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Content

- Understand the nature of informational failures in free markets
- Evaluate government interventions to resolve this market failure

Readings on informational failures:

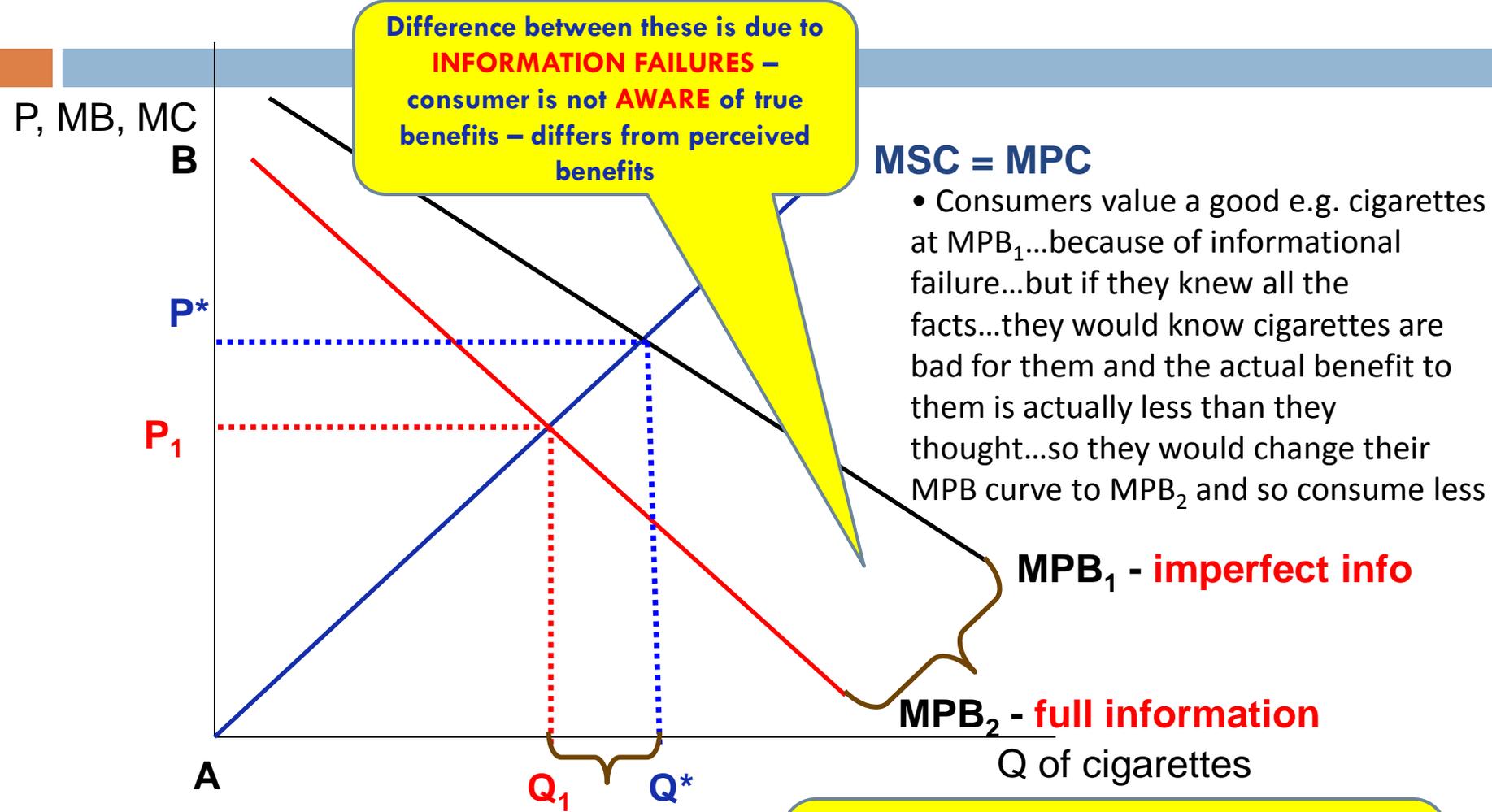
If Life Gives You Lemons ... [Why you can never buy a decent used car](#); By
Tim Harford

The Market for Lemons ([1970](#)); By George Akerlof
Sawbones, cowboys and cheats (2006); [From The Economist](#)

Informational failure – imperfect information

- ❑ So far we have assumed that both consumers and producers have perfect information
 - ❑ In reality, consumers and producers are **not fully aware** of the costs/benefits of their consumption/production decisions
- ❑ Thus their consumption/production decision is being based **incomplete / incorrect** information
- ❑ If *complete* information was **now** given to consumers...and they realise the benefits are **not as big** as they *think...MPB shift to the left...and consumption falls*
- ❑ If *complete* information was **now** given to consumers...if they realise the benefits are **greater** than they *think...MPB shift to the right...and consumption rises*
- ❑ Similarly, the MPC curve could be in the incorrect position, with consumers/producers not being fully aware of the **true** costs of an economic decision

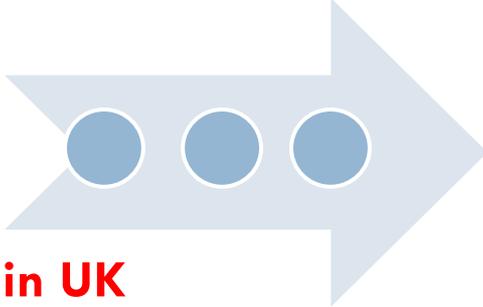
Informational failure – imperfect information



The same idea can be expressed using MPC – the consumer believes the private cost to them at the margin is simply the cost of the cigarette packet, when in reality it is the road to cancer...

Examples of information failures:

What about under/over-consumption of merit/de-merit goods – TWE can this be attributed to informational failures?

- 
- ❑ **Global warming**
 - ❑ **Smoking**
 - ❑ **Exercise**
 - ❑ **Antibiotics/painkillers**
 - ❑ **Contraception**
 - ❑ **Seatbelts**
 - ❑ **Obesity problem in UK**
 - ❑ **Drugs use**
 - ❑ **Under-saving for pensions**
 - ❑ **Fastfood**
 - ❑ **Alcohol consumption**
 - ❑ **Volume on portable music players**
 - ❑ **Solariums / sunbeds**
 - ❑ **Bottled water consumption** - In 1999, U.S. consumers paid between 240 and 10,000 times more per unit for bottled water than for tap water
 - ❑ Is it a problem of **myopia**?
 - ❑ Is it a problem of very complex information that **cannot be read accurately**?
 - ❑ Is it a problem of being **persuaded (mis-led?) by advertising**?
 - ❑ Is it genuine **inability** to be able to consume the g/s e.g. cannot afford to save?

Information failure – ASYMMETRIC information

In many of these markets, there is an incentive to lie about one's "type" before the contract is signed. The problem is to design a contract which induces the individual not to lie

❑ Akerlof's Lemons (George Akerlof, 1970)

- ❑ A "lemon" is a dodgy defective (second hand) car
- ❑ Uses asymmetric information to explain why certain markets are absent (or very limited) – e.g. *market for second hand cars, formal credit markets in developing countries, unavailability of health care for elderly people; productivity in workplace*
- ❑ Akerlof's lemons refers to **ADVERSE SELECTION**
 - ❑ As a result of asymmetric information, *parties with superior information may strategically select to participate in or abstain from a given market*

Imperfect info vs Asymmetric info:

Lacking crucial information to make rational decisions vs one party having more information than the other



Information failure – ASYMMETRIC information

Apply this process to credit markets in a village in East Timor,; the health insurance markets for elderly people

Note: Insurance firms keep raising premia because they are making too many losses from “lemons”, which keeps deterring high quality insurees, which keeps raising losses, which leads to higher premia

□ Akerlof's Lemons (George Akerlof, 1970)

- Reasoning is as follows:
- “Quality” of the good is undistinguishable by looking at it (e.g. second hand car,) i.e. cannot tell if its “high” or “low”
- There is an **asymmetry of information between the buyer and seller** (the buyer doesn't know everything but the seller knows a lot about the “quality” of the second hand car)
- Since the buyer is uncertain of the quality, he will look at the **“average quality”** in the market – even if the actual quality of this specific item is much higher (since he doesn't know this)
- This means that he is only willing to pay an “average” value for the good...So what will happen in the market?
- Those second hand cars that are of high quality...will **cease to be sold in the market**... since the sellers know they are of high quality...and know they are not getting a good price for them
- The “lemons” of low quality... will be **increasingly sold in the market**... since the sellers realise they can get a higher price than they are truly worth (because the buyer cannot distinguish between high and low quality goods so he pays “average” amounts for both types)
- Each time a high quality good stops being sold in the market...the average quality (upon which price is being based on by the buyer who suffers from asymmetric information) will be **lower**... and the lower it is... the more high quality goods will leave the market... and the lower the price will get...

In its extreme... we can get to a **no-trade equilibrium** – i.e. **no market exists...**“the bad drives out the good”.

ASYMMETRIC information – MORAL HAZARD

- **MORAL HAZARD** is another phenomenon that arises from Asymmetric information
 - when the party with superior information alters his behaviour in such a way that benefits himself while imposing costs on those with inferior information
- e.g. in health insurance markets
 - the insurer does not know how many cigarettes you really smoke
- After you have managed to get health insurance, you can now start smoking much more, eating much more fatty foods etc
- Why? Because you have obtained cheap health insurance and so will get paid out if health deteriorates (**risk has been redistributed from the insured to the insurer**)
- Cost to society? – increased insurance premia for everyone else, increased payouts by firms
- Similar example on fire/car insurance, on (some) IMF lending (where bailouts involved)...

And most recently, the bailout of financial institutions (Northern Rock) by governments and central banks – Mervyn King – Sept 2007 - “The provision of such liquidity support undermines the efficient pricing of risk by providing ex post insurance for risky behaviour. That encourages excessive risk-taking, and sows the seeds of a future financial crisis”.

Lawrence Summers writes [here](#) in the FT on whether it is a problem though.

Examples of MORAL HAZARD

Dentists and patients face the problem of moral hazard (supplier-induced demand)

NHS creates both an ex-post and ex-ante moral hazard since it provides medical services for free...

Lose money on prevention ...

\$455



Amount that can be lost by a comprehensive diabetes center when a patient visits its preventive specialists.

... or make it on complications.

\$1,499 to \$11,360



Amount that can be made by a hospital when preventive care fails and a diabetic's foot must be amputated.

- ❑ January 11, 2006, **The New York Times** reported this instance of moral hazard:
- ❑ *"In The Treatment of Diabetes, Success Often Does Not Pay" illustrates the moral hazard: the worse the patient outcome, the more money the doctor takes home.*
- ❑ *And the difference isn't trivial: a diabetes centre loses an average of \$455 each time a patient comes in for a checkup, but when complications occur and a diabetic's foot must be amputated a hospital stands to make between \$1,499 and \$11,360.*
- ❑ December 23, 1974, **The Wall Street Journal** reported this bizarre moral hazard:
- ❑ *"[T]here is the macabre case of a small Florida town that insurance investigators decline to identify by its real name because of continuing disputes over claims. Over 50 people in the town have suffered 'accidents' involving the loss of various organs and appendages, and claims of up to \$300,000 have been paid out by insurers. Their investigators are positive the maimings are self-inflicted; many witnesses to the 'accidents' are prior claimants or relatives of the victims, and one investigator notes that 'somehow they always shoot off parts they seem to need least.'"*

SOLUTIONS TO INFO FAILURE PROBLEMS

SIGNALLING (*Spence*) vs. SCREENING (*Stiglitz*)

- Awareness campaigns by the government
 - E.g. anti drug campaigns ([Talk2Frank](#)), anti-smoking [campaigns](#)
- Compulsory labelling e.g. on food ([Traffic Lights](#) from FSA); health warnings on cigarette packets
- Advertising Standards Agency rulings e.g. on [alcohol adverts](#); [green credential claims](#)
- Warranties/guarantees – solves *adverse selection* but exacerbates *moral hazard* issue
- Compulsory health screenings pre-insurance
- Log service records e.g. for second hand cars
- Compulsory pension savings [schemes](#) – link to Thaler's Nudge?
- Accreditation schemes
- Excess payments for insurance claims
- The growth of the Internet has reduced information asymmetry, particularly on the buyer side e.g. product reviews in [Which?](#) magazine
- Charge consumers to use NHS – will solve moral hazard problem but...?
- Product differentiation e.g. create different insurance policies for male/female drivers
- Lower welfare payments but...?



EXTENSION FOR OXBRIDGE STUDENTS (1)

□ ***Algebraic analysis of asymmetric information and Akerlof's Lemons***

- In the market for second hand cars, there are some cars that are of high quality and some that are of low quality – the latter are commonly known as “lemons”
- Clearly, there is an asymmetry of information between the buyers and sellers of these cars – namely that, generally speaking, sellers have superior information than buyers
- A seller will know (more or less) if his car is a lemon or of good quality; whilst buyers cannot, *prima facie*, discern the difference
- There is clearly some probability that when a buyer buys a second hand car, it will turn out to be a lemon, some of the time

EXTENSION FOR OXBRIDGE STUDENTS (2)

- There are four types of cars then in the car market: namely, both **new and second hand** cars, some of which are **high quality** and some of which are **lemons**, with some probability

N_H = the value of a new high quality car
 N_L = the value of a new lemon car
 U_H = the value of a used high quality car
 U_L = the value of a used lemon car
 β = the % of high quality cars in the market
and $1 - \beta$ = the % of bad cars

- Let's assume that a lemon is a lemon is a lemon, whether it is a new car or used car and is worthless

$$N_L = U_L = 0$$

- And (unsurprisingly) a new high quality car is worth more than a used high quality car

$$N_H > U_H > 0$$

- FROM THE BUYER'S PERSPECTIVE:**

- The expected value of a used car or new car is given by:

$$EV_{(U)} = \beta U_H + (1 - \beta) U_L$$
$$EV_{(N)} = \beta N_H + (1 - \beta) N_L$$

Thus:

$$EV_{(U)} = \beta U_H$$
$$EV_{(N)} = \beta N_H$$

EXTENSION FOR OXBRIDGE STUDENTS (3)

- Since there is asymmetric information, buyers **cannot tell the difference** between a high quality used car or a lemon used car, so all used cars (whether they are a lemon or not) are sold for the same price, P_U
- Buyers can choose to buy a new car or a used car
- A consumer will purchase a car whose expected value is greater than the price of the car (a basic cost-benefit analysis)

$$EV_{(U)} > P_U$$

- More specifically, a buyer will buy a **used** car over a **new** car, if the net gain to him of the former is greater than the latter:

$$EV_{(U)} - P_U \geq EV_{(N)} - P_N$$

$$P_U \leq EV_{(N)} - EV_{(U)} + P_N$$

- This equation on the right isn't saying anything new really – its just saying that in a cost-benefit analysis, you would buy a used car if its price is less than the value you got from it, once you take into account the option of buying the new car
- Substituting in the expected values gives you a **reservation price** for buyers

$$P_U \leq \beta (U_H - N_H) + P_N$$

EXTENSION FOR OXBRIDGE STUDENTS (4)

FROM THE SELLER'S PERSPECTIVE:

- A **bad** used car (U_L) will be sold on the market if

$$EV_{(N)} - P_N + P_U \geq 0$$

- Which is saying that you will sell your used car if you can get a new car with the money you receive from the sale of your used car and the value from the new car leaves you in a net better position.
- Substituting in the expected value derives a **reservation price** for the sellers of **bad used (lemons) cars**:

$$P_U \geq P_N - \beta N_H$$

- On the other hand, a **high quality** used car (U_C) will be sold if:

$$EV_{(N)} - P_N + P_U \geq U_{(H)}$$

$$P_U \geq P_N + U_H - EV_{(N)}$$

- All this formula is saying is, **given you know the value of your used car (that it is high)**, you will only sell it (and get a new car), if there is a net benefit to you. If the value you get from your current old car is **less** than the net cost to you of purchasing a new car taking into account the value you get from the new car. (By the “net cost”, I mean the price difference in what you receive for the used car you sell, and what you pay for the new car).
- Substituting in the expected values gives you a **reservation price** for SELLERS of high quality used cars:

$$P_U \geq P_N + U_H - \beta N_H$$

EXTENSION FOR OXBRIDGE STUDENTS (5)

- So now we have reservation prices for both the buyer and seller (of high quality cars and lemons)
- For sellers of high quality used cars it is:

$$P_U \geq P_N + U_H - \beta N_H$$

- And for buyers of used cars it is:

$$P_U \leq \beta (U_H - N_H) + P_N$$

- If you compare the buyer and seller reservation prices of high quality used cars, you should be able to see that they cannot agree on a price to buy/sell at – there are no mutually beneficial “exchange rates”
- The P_N 's cancel, as does the $-\beta N_H$; leaving you with the minimum price a seller of a high quality used car is willing to receive as: U_H (its true value, which he knows); and the maximum price a buyer is willing to pay (given he has no clue as to its true value) as βU_H .
- Thus, since $0 < \beta < 1$, clearly the maximum price a buyer is willing to pay for a high quality used car is less than the minimum price a seller of a good used car is willing to pay.
- *The buyers of used cars will only purchase if the price is sufficiently “low” as they realise they may get stuck with a bad car (since they cannot observe the quality of the car prima facie)*
- Thus the high quality used car sellers will LEAVE THE MARKET – leaving only the bad lemon sellers... “the bad driving out the good”, until only the lemons are sold

EXTENSION FOR OXBRIDGE STUDENTS (6)

- For the sellers of bad used (lemons) cars their reservation price is:

$$P_U \geq P_N - \beta N_H$$

- And for buyers

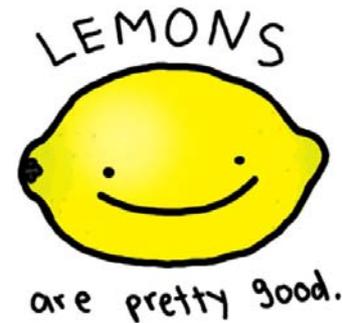
$$P_U \leq \beta (U_H - N_H) + P_N$$

So solution requires
SIGNALLING and
SCREENING

- If you compare the buyer and seller reservation prices of good used cars, you should be able to see that trade will occur:
- The only difference in the two equations is the βU_H
- The buyer has this variable in his equation whilst the lemon seller does not; since $0 < \beta < 1$, then this implies that the buyer is willing to buy at a higher price than the seller is willing to sell; leading to a transaction in lemons
- Basically, a lemon seller knows the car is a lemon, which means he will sell it at (almost) any price, whilst the seller of a good used car known his car is NOT a lemon, and will not sell at low prices.*
- This drives out the good cars, which means a higher % of the cars in the used market are lemons; which lowers β , which in turn lower the reservation price of buyers, since they become more and more uncertain of acquiring a lemon.*

SUMMARY – You should understand by now...

- The different types of informational failures
- Asymmetric vs Imperfect
- Moral Hazard problem
- Akerlof's Lemons
- How government's intervene to resolve info failures
- **Oxbridge extension** – algebraic analysis of Akerlof's Lemons



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