Handout 2

Adverse Selection

- **Example 1: The Used Car Market**
  - Quality of car **unknown** before it is bought
  - You don’t know the quality, thus only willing to pay a price for average quality.
  => Price will reflect **average quality** in pool
  - Sellers of bad cars get a good deal, **sellers of good cars get a bad deal**
  - Some sellers of good cars might withdraw
  - ‘Adverse selection’ of cars **remaining in the pool**, cars that left in the market are of bad quality, or ‘lemon cars’

This is first modeled by a Noble Prize winner (2001) George Akerlof.


Could you think of a solution to the ‘lemon car’ problem?
An ideal car dealer would provide expert information of cars so that quality of each car becomes known.

- **Example 2: The Loan Market**
  - Expected income (thus **ability to repay**) of borrower **unknown** before loan is made
  - **Loan interest rate** will reflect **average** ability to pay in pool
  - Low income borrowers get good deals, high income borrowers get bad deals
  - Some high income borrowers will not borrow
  - ‘Adverse selection’ of borrowers who are less likely to repay loans remains
  - Market may **bread down**

Could you think of a solution to the loan market problem?
Banks keep a record of each borrower so that the ability to repay loans of these borrowers are now partly known.

- **An Detailed Illustration of Adverse Selection in Loan Markets:**
  (form Dr. Tesfatsian’s webpage)

In the context of a loan market, an adverse selection problem can arise between lenders (i.e., buyers of newly issued financial assets) and borrowers (i.e., sellers of newly issued financial assets). In particular, if a lender sets contractual terms in advance in an attempt to protect himself against the consequences of inadvertently lending to high risk borrowers, these contractual terms might have the perverse effect of encouraging high
risk borrowers to self-select INTO the lender's loan applicant pool while at the same time encouraging low risk borrowers to self-select OUT of this pool. In this case, the lender's pool of loan applicants is adversely affected in the sense that the average quality of borrowers in the pool decreases.

Suppose, for example, that 50% of potential borrowers in the population at large are high risk, in the sense that there is a high probability they would default on their loan payments, and 50% are low risk in the sense that there is a low probability they would default on their loan payments. A banker is willing to loan to high risk borrowers at an 11% interest rate and to low risk borrowers at a 5% interest rate. Thus, the "risk premium" required by the bank is 6%.

Prior to making a loan to any individual, the bank has no way of knowing whether the individual is a high risk or a low risk borrower. However, the bank knows that the two types of individuals (high risk and low risk) are equally represented in the population. Consequently, prior to actually making any loans, the bank concludes there is a 50-50 chance that any given would-be borrower is high risk or low risk. It might therefore seem reasonable to the bank to charge an interest rate that is an average of the rates for high and low risk borrowers, so the bank sets its loan interest rate at 8%.

Unfortunately for the bank, high risk borrowers will view 8% as a great rate since they know the risk of their projects actually warrants a higher rate -- indeed, they would be required to pay 11% if the bank knew their true quality. Consequently, high risk borrowers have an incentive to apply for loans from the bank. On the other hand, low risk borrowers will view 8% as an unnecessarily high and costly interest rate, and they might turn elsewhere for funds or abandon their intended investment projects altogether.

Consequently, although high risk and low risk borrowers are equally represented in the population at large, when the bank offers a loan rate of 8% the percentage of high risk borrowers attracted to the bank's pool of loan applicants will tend to rise above 50% and the percentage of low risk borrowers in this pool will tend to fall below 50%.

Being rational, the bank might be able to predict this eventuality in advance, in which case the bank might conclude it should set an interest rate higher than 8% to compensate for the fact that more than 50% of its loan applicant pool will be high risk. However, the effect of any such increase will only be to further compound the adverse selection problem, because low risk borrowers will have an additional incentive to select out of the bank's loan applicant pool. Indeed, all low risk borrowers may eventually be driven out of this pool altogether, leaving only high risk borrowers who are each charged a rate of 11%. To the extent that profits could also have been made on low risk borrowers at a rate as low as 5%, the bank will then be missing out on good profit opportunities.
Moral Hazard

- **Example 1: The car insurance market**
  - Insurance company **cannot control** how careful homeowner is
  - Insured homeowner **more ‘reckless’** than uninsured
  - **Premium must go up**
  - Homeowners end up not buying insurance

- **Example 2: The Stock Market**
  - Shareholders **cannot control** whether manager undertakes useful projects or his own ‘pet projects’
  - Managers with **access to lot of funds will misuse it**
  - Investors reluctant to provide funds
  - Firm ends up not getting funded, useful projects not undertaken

- **Financial Intermediaries also could have Moral Hazard problems**

(form Dr. Tesfatsian’s webpage)

Previously, we talked about adverse selection and moral hazard in financial markets, and we would say that financial intermediaries would have an advantage to lessen these asymmetric information problem compared with financial markets. However, in some cases, financial intermediaries have their own problems, like in the following example:

This is precisely the type of moral hazard problem that arose in the savings and loan debacle in the United Stated during the 1980s. In essence, the government, through the agency of a regulatory body called the Federal Savings and Loan Insurance Corporation (FSLIC), fully insured the majority of the deposit accounts held by savings and loan (S and L) associations. When the ceiling on depositor interest rates was lifted in the mid 1980's -- so that S and L's now had to offer higher interest rates to depositors to compete for funds -- the S and L's then had every incentive to move into riskier lending at higher charged interest rates in an attempt to maintain their profit margins (borrow low-lend high). This, in turn, significantly increased their probability of bankruptcy, and hence the risk to taxpayers --- the ultimate underwriters of FSLIC insurance.