1 International Trade

1.1 Lecture 18: International Trade

1.1.1 What is International Trade?

- **Autarky-** an environment in which trade does not exist
- **trade decit** = imports-exports

1.1.2 Comparative Advantage and Gains from Trade

- We say a country has a **comparative advantage** in the production of a good when the opportunity cost of producing a particular good is lower in any one country.
- Differences in opportunity costs lead to comparative advantage in different goods
- Even when countries have an **absolute advantage** in producing a good, there can be comparative be a comparative advantage
- When countries have different comparative advantages in production of different goods, there are potential gains from trade through **specialization-** each country produces what it has a comparative advantage in producing.

1.1.3 Welfare Implications from International Trade

- In competitive model, opening to trade unambiguously increases total welfare but usually at the expense of either consumers or producers

1.1.4 Trade Policy

- Effects of **import tariffs** (tax levied on imported goods) and quotas

1.1.5 TO KNOW- Conceptual Understanding

- Distinguish between comparative advantage and absolute advantage
- Explain why international trade unambiguously raises social welfare
- Give arguments for and against free trade

1.1.6 TO KNOW- Graphical and Math Understanding

- Given costs of production for two nations, determine, for each good, which country has an absolute and/or comparative advantage
- In diagrams and math, show the welfare impact of imports and exports in US markets (In lecture, we did an example with roses and computers.)
- Analyze the welfare impact of an import tariff

2 Uncertainty

2.1 Lecture 19- Uncertainty

2.1.1 Expected Utility and Expected Value

- **Expected value**

  1. A random variable X can take the values $x_1, x_2, ... x_k$ and each value occurs with probability $p_1, p_2, ... p_k$. Then the expected value of X is

  $$E[X] = x_{1*}p_1 + x_{2*}p_2 + ... x_k p_k$$

     - In other words, the expected value is the sum of the probability of each outcome times the value of that outcome
     - **A fair gamble**- zero expected value

- **Expected utility:**

     - Probability-weighted average of utility

  $$EU[X] = u(x_1) * p_1 + u(x_2) * p_2 + ... u(x_k) * p_k$$

     - EU = Pr(Lose) U(Lose) + Pr(Win) U(Win)
     - Different than utility of expected value, since utility functions usually concave (diminishing MU of income)! Diminishing MU of income means that the next dollar is worth less to you than the last one was in terms of happiness you gain

2.1.2 Risk preferences

- **Risk Averse-** Concave utility (decreasing MU income)

$$U[C] = \sqrt{C}$$

- **Risk Neutral-** Linear utility (constant MU income) - an agent only cares about expected value!

$$U[C] = C$$

- **Risk Loving-** Convex utility (increasing MU income

$$U[C] = C^2$$

2.1.3 Applications

1. Insurance

   (a) Risk averse people will pay money to turn a gamble into a certain payoff since they get higher utility from certain income than from a gamble with the same expected value

   (b) Maximum amount they're willing to pay for this is their **risk premium**

       i. The risk premium rises as the size of the loss rises (holding other variables constant)

       ii. The risk premium falls as income rises (because loss is closer to linear)

   (c) Lottery behavior is a puzzle - maybe risk averse at low incomes and risk loving at high incomes

2.1.4 TO KNOW- Conceptual Understanding

- Explain why there is less risk aversion for small gambles

2.1.5 TO KNOW- Graphical and Math Understanding

- Given a utility function, be able to determine whether the agent is risk neutral, risk averse, or risk loving

- Calculate the expected value and expected utility from a gamble, given a utility function and a description of the gamble

- Calculate the risk premium for insurance, given a utility function and a description of the relevant risks

3 Capital Supply and Capital Markets

3.1 Lecture 20- Capital Supply and Capital Markets

3.1.1 Capital and Intertemporal Choice

- **Capital Markets-** pools of money that firms can draw on to make investments

- **Supply of capital** comes from household decisions about how much to save - increasing in the interest rate

- **Demand for capital** comes from firms with potentially productive investments to make- decreasing in the interest rate

- **Interest Rate-** rate firms have to pay a household to lend money

3.1.2 Intertemporal choice

- Graph over consumption in period one (C1 on x-axis) and in period 2 (C2 on y-axis).

- Slope of the BC is -(1 + r)

- When r changes, effect on savings depends **on relative size of IE and SE**

3.1.3 Present Value

- A dollar today is worth less than a dollar tomorrow because today's dollar can be invested and an interest rate can be earned

- Need to translate all future dollars into today's terms in order to compare investment and consumption options

- **Present value-**the value of eaach period's payment in today's terms- each payment is weighed according to how far in the future it is

- For a single payment of FV in year t:

$PV = \frac{FV}{(1+r)^t}$

- Value of a perpetuity- constant payment of f every period forever:

$PV = \frac{f}{r}$

- Importance of compunding

- Real interest rate r is the one we care about - the nominal interest rate i minus inflation π

$r = i - \pi$

3.1.4 Present value, utility functions, budget constraints and household maximization

- Households maximize utility over time subject to an intertemporal budget constraint

- The total utility of a household that lives in two periods and consumes c_1 in period 1 and c_2 in period 2 and discounts the future with discount factor β is

$U = u(c_1) + \beta u(c_2)$

- Budget Constraint

  - Household can save s of its income in the first period (y_1), or it can borrow against its second period income (y_2)

- Interest rate on both savings and on loans is equal to r
- Budget constraint in first period of life $c_1 + s = y_1$
- Budget constraint in second period of life $c_2 = y_2 + (1+r)s$
- Together $c_1 + \frac{c_2}{1+r} = y_1 + \frac{y_2}{1+r}$

3.2   Lecture 21 - Capital Market

3.2.1   Choices Over Time - How to choose between investment options with different payout streams over time?

- Choose option with highest present value when choosing between projects or investments

3.2.2   Investment Decisions

- **Net Present Value (NPV)** = PV of revenues - PV of costs

- Rule: Invest if NPV greater than zero

- if revenues R_t in each period and costs C_t, NPV of investment is:

$NPV = [(R_0 - C_0) + \frac{R_1 - C_1}{(1+i)^1} + \frac{R_2 - C_2}{(1+i)^2} ... + \frac{R_t - C_t}{(1+i)^t}]$

- NPV decreasing in interest rate for projects with up-front costs and future payos

3.2.3   Increasing Savings

- Savings important for economic growth

- Government encourages savings using tax subsidies to retirement savings

3.3   TO KNOW- Conceptual Understanding

- Explain how the interest rate is determined in a capital market equilibrium

- Describe how individuals make intertemporal consumption decisions

- Intuitively describe the income and subsitution effects on current consumption when the interest rate changes

- Explain the reasons why supply of funds in a capital market is upward sloping while demand for funds in downward sloping

3.4 TO KNOW- Graphical and Math Understanding

- Show in a graph and calculate how a consumer chooses C_1 (consumption this year) and C_2 (consumption next year) given an income in the first year and a utility function

- Show in a graph the income and substitution effects on C_1 (consumption this year) and C_2 (consumption next year) when the interest rate changes

- Solve problems involving present and future values

- Solve problems in which agents have different potential income streams over time and have to make intertemporal utility maximization decisions. Note: we did not cover mathematical intertemporal maximization (utility function subject to an intertemporal budget constraint), but you need to be able to think through intertemporal problems conceptually.

- Calculate the present value (PV) of a payout stream over time

- Calculate the net present value (NPV) of an investment choice for a firm

4 Equity and Efficiency

4.1 Lecture 22: Equity and Efficiency

4.1.1 Choosing the Socially Optimal Allocation

- **Social welfare function (SWF)** can be though of as a utility function for society taking individual utilities as inputs

$SWF = f(U_1, U_2, ...)$

- **Isowelfare curves**- distributions of utilty across which society is indifferent

- **Utilitarian**
  $SWF = U1 + U2 + ..$

- **Rawlsian SWF**

$SWF = min(U1, U2, ...)$

4.1.2 Inequality in the US and Around the World

- See class handouts on inequality, poverty line, poverty rates over time

4.1.3 Sources of Leakage

- Recall transfer program discussed in class - leads to decrease in labor supply especially among those who qualify or are originally near the cutoff to receive the subsidy.

- Distortionary taxation leads to DWL-this is the cost of redistribution

4.2 TO KNOW- Conceptual Understanding

- Explain what different social welfare functions imply about optimal allocations

- Intuitively describe the efficiency cost of redistribution

4.3 TO KNOW- Graphical and Math Understanding

- Show in a consumption-leisure graph how taxes on labor income could affect labor supply; then in a labor market graph, show the DWL of putting taxes on labor income

- Do simple calculations to determine welfare under different SWF

5 Taxation and Redistribution

5.1 Lecture 23: Taxation and Redistribution

5.1.1 Taxation in the U.S.

1. Income tax (progressive, main tax in the U.S.)

2. Payroll tax (flat)

3. Consumption tax (regressive, paid on spending rather than earnings)

4. Property tax (tax on wealth)

5. Corporate tax (tax on businesses, small share of total tax revenue)

5.1.2 What Should We Tax?

1. European countries raise most revenue through VAT on consumption

2. Consumption taxes encourage savings but not progressive

3. Excise taxes usually on "sin goods"

    (a) **Negative externality-** negative impacts on society which the individual does not pay for. Must abide by two conditions

        i. Costs on others, not self

    ii. Costs that the individual doesn't pay for

    iii. ex: smoking, drinking

    iv. Individuals tend to overconsume these as they do not bear all of the costs

  (b) **Corrective taxation**

    i. Society wants individuals to internalize the externality- price of the good includes the cost of the good to society

5.1.3 What is the Right Tax Rate?

1. Tax revenues $= base * t$

2. As tax rate rises, base shrinks

$\frac{d(taxrevenue)}{dt} = base + t * \frac{d(base)}{dt}$

1. **Laffer curve** - tax revenue initially rising, then falling with tax rate (depends on elasticity of tax base)

5.1.4 Low Income Programs in the U.S.

1. Importance of targeting assistance programs

2. **Earned Income Tax Credit (EITC)** is a wage subsidy program that balances targeting and efficiency

5.2 TO KNOW- Conceptual Understanding

- Identify whether a particular tax is progressive, flat, or regressive

- Discuss the Laffer curve and implications for the tax rate

6 Social Insurance

6.1 Lecture 24: Social Insurance

6.1.1 Why social insurance?

- Reason to believe that private insurance **underinsures** individuals

- **Information Asymmetry**

  - The difference in information that is available to sellers and to purchasers in a market

  - Can cause **failure in competitive markets**- when trades that are valued by buyers and sellers do not occur due to asymmetric information

- **Adverse selection**: when only riskiest people will buy insurance

- What can the government do?

  - Subsidize health insurance
  - Mandate health insurance
  - Directly provice insurance (social security, disability insurance)

6.1.2 The Social Insurance Tradeoff

- **Moral hazard**

  - Adverse behavior that is encouraged by insuring against adverse events
  - Becomes a major problem in social insurance programs
    * Can lower efficiency by removing productive trades
    * Need to raise revenues to pay for insuring these individuals (reduces efficiency)

- The trade off

  - Between benefits of helping overcome insurance market failure and costs of encouraging moral hazard.

6.2 TO KNOW- Conceptual Understanding

- Explain how adverse selection can lead to unraveling so that private firms no longer offer insurance

- Describe three ways the government can combat unraveling in an insurance market

- Define moral hazard and explain how it arises from insurers having imperfect information

7 Behavior Economics

7.1 Lecture 25- Behavioral Economics

7.1.1 Exponential discounting

$U = u(C_1) + \sum_{i=2}^{T} u(C_i) * \delta^i$

7.1.2 Hyperbolic discounting

$U = u(C_1) + \beta \sum_{i=2}^{T} u(C_i) * \delta^i$

7.2   TO KNOW- Conceptual Understanding

- Write out (1) exponential discounting model and (2) the hyperbolic discounting model; contrast the models

- Explain what behavioral economists mean by

  - Loss aversion
  - Unstable preferences
  - Biases in statistical judgments
  - Intrinsic vs. extrinsic motivation
  - Defaults and presentation effects

- Explain how corrective taxes can address time-inconsistency (ex. smoking)

- Explain how government bans can address biases in statistical judgments

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