

---

# INTERMEDIATE MACROECONOMIC ANALYSIS (ECON 325): OVERVIEW

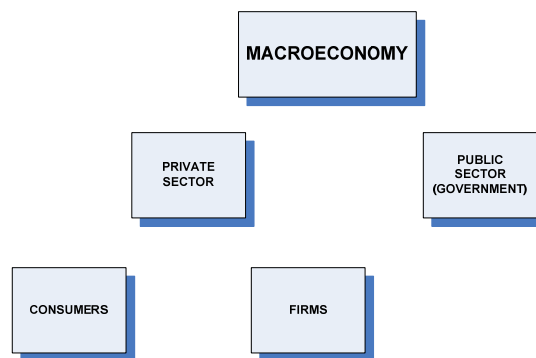
JANUARY 26, 2009

---

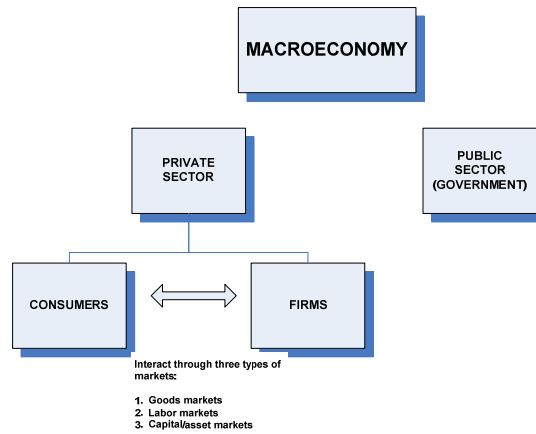
*Introduction*

## BUILDING BLOCKS OF AN ECONOMY

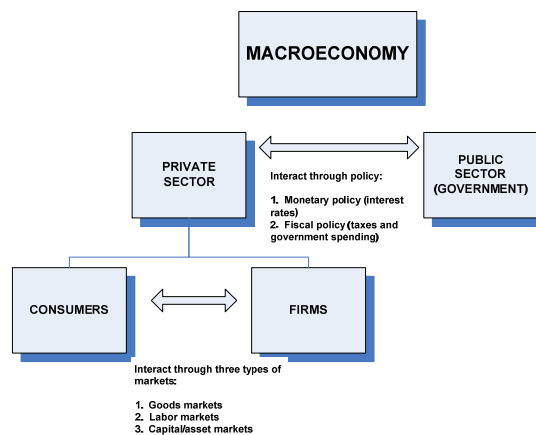
---



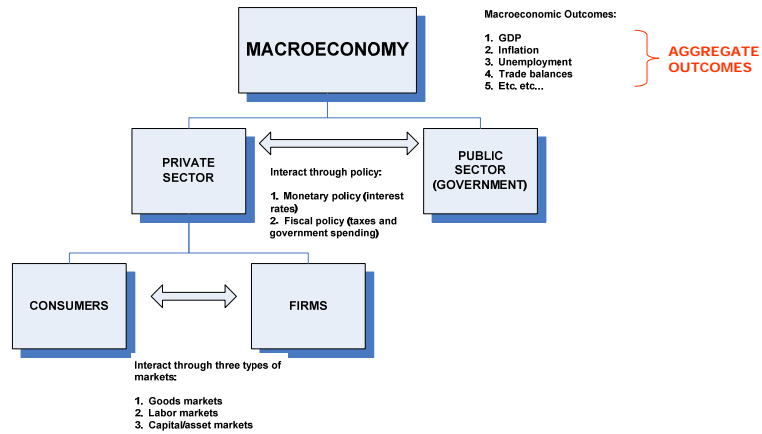
## BUILDING BLOCKS OF AN ECONOMY



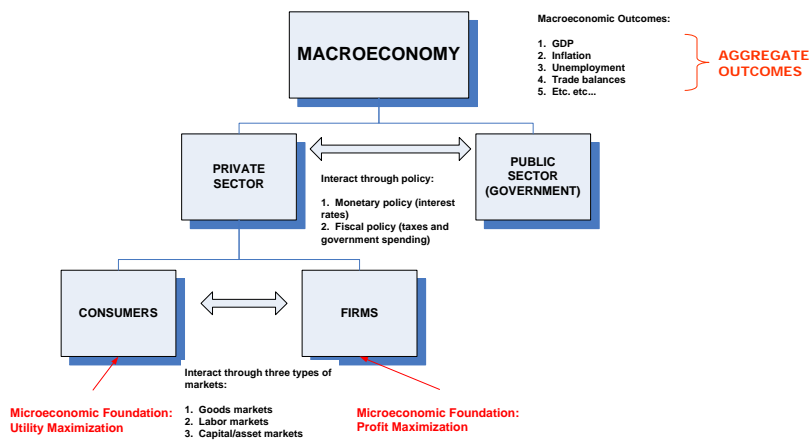
## BUILDING BLOCKS OF AN ECONOMY



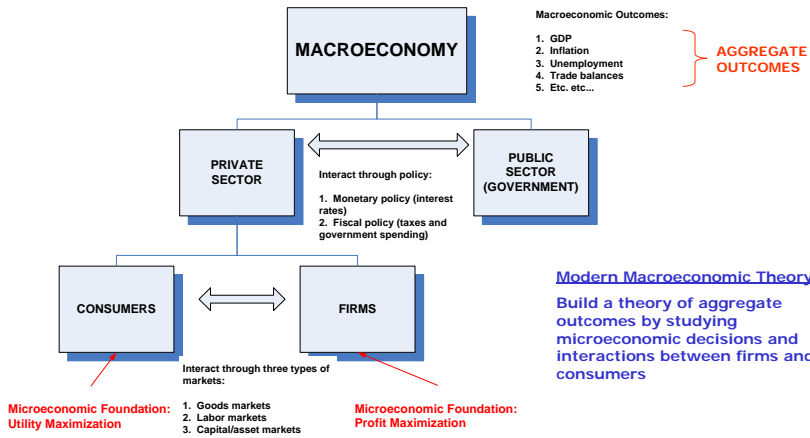
# BUILDING BLOCKS OF AN ECONOMY



# BUILDING BLOCKS OF AN ECONOMY



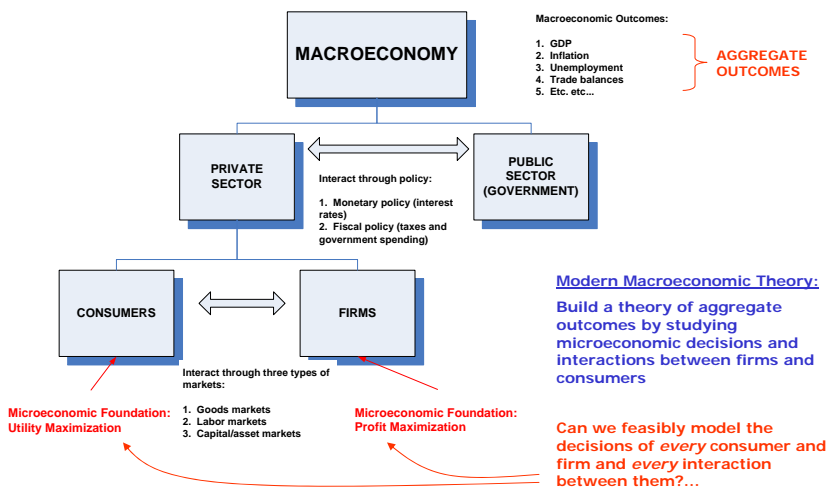
# BUILDING BLOCKS OF AN ECONOMY



January 26, 2009

7

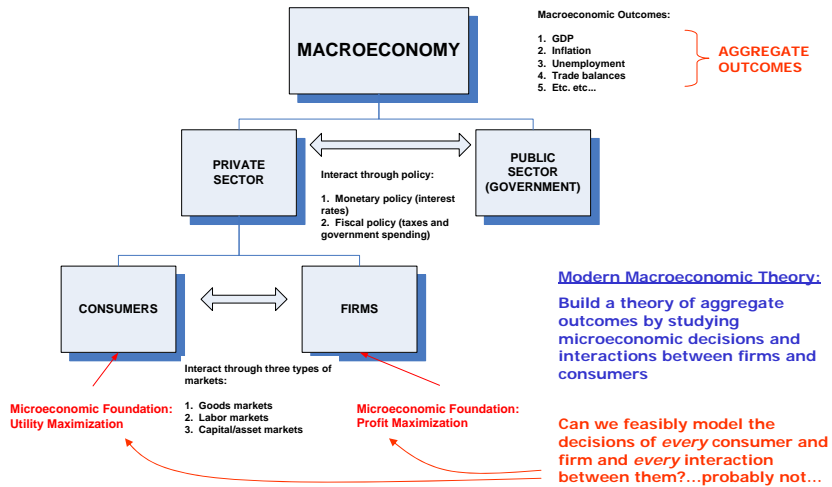
# BUILDING BLOCKS OF AN ECONOMY



January 26, 2009

8

## BUILDING BLOCKS OF AN ECONOMY



January 26, 2009

9

## REPRESENTATIVE-AGENT MACROECONOMICS

- Consumer A: Consumed \$50 in Year X
  - Consumer B: Consumed \$75 in Year X
  - Consumer C: Consumed \$100 in Year X
  - Consumer D: Consumed \$125 in Year X
  - Consumer E: Consumed \$150 in Year X
- No other consumers in the economy

January 26, 2009

10

## REPRESENTATIVE-AGENT MACROECONOMICS

- Consumer A: Consumed \$50 in Year X No other consumers in the economy
- Consumer B: Consumed \$75 in Year X
- Consumer C: Consumed \$100 in Year X
- Consumer D: Consumed \$125 in Year X
- Consumer E: Consumed \$150 in Year X
  
- Aggregate** (i.e., economy-wide) consumption = \$500
- Average** consumption = \$100
  
- Macroeconomics is most concerned with **aggregate** outcomes

## REPRESENTATIVE-AGENT MACROECONOMICS

- Consumer A: Consumed \$50 in Year X No other consumers in the economy
- Consumer B: Consumed \$75 in Year X
- Consumer C: Consumed \$100 in Year X** THE REPRESENTATIVE CONSUMER
- Consumer D: Consumed \$125 in Year X
- Consumer E: Consumed \$150 in Year X
  
- Aggregate** (i.e., economy-wide) consumption = \$500
- Average** consumption = \$100
  
- Macroeconomics is most concerned with **aggregate** outcomes
  
- If we want to take a micro-based approach to modeling aggregate outcomes...
- ...**model Consumer C's behavior/decision-making**

## REPRESENTATIVE-AGENT MACROECONOMICS

- ❑ Consumer A: Consumed \$50 in Year X No other consumers in the economy
- ❑ Consumer B: Consumed \$75 in Year X
- ❑ **Consumer C: Consumed \$100 in Year X** THE REPRESENTATIVE CONSUMER
- ❑ Consumer D: Consumed \$125 in Year X
- ❑ Consumer E: Consumed \$150 in Year X
  
- ❑ **Aggregate** (i.e., economy-wide) consumption = \$500
- ❑ **Average** consumption = \$100
  
- ❑ Macroeconomics is most concerned with **aggregate** outcomes
  
- ❑ If we want to take a micro-based approach to modeling aggregate outcomes...
- ❑ ...**model Consumer C's behavior/decision-making**
  
- ❑ **A simplistic approach – turns out to yield surprisingly rich results, insights, and predictions**

January 26, 2009

13

## LOGISTICS

- ❑ **Professor Sanjay Chugh**
  - ❑ Email: [chughs@econ.umd.edu](mailto:chughs@econ.umd.edu)
  - ❑ Office Hours: Mondays, 9:00am-10:15am, Tydings Hall 4121C
  
- ❑ **Teaching Assistants**

Rong Qian	<a href="mailto:qian@econ.umd.edu">qian@econ.umd.edu</a>
Office Hours	Thursdays, 9:00am-10:30am, Morrill 0101
Elif Ture	<a href="mailto:ture@econ.umd.edu">ture@econ.umd.edu</a>
Office Hours	Thursdays, 9:00am-10:30am, Morrill 0101
  
- ❑ **Lectures:** Mondays and Wednesdays, 11:00am-11:50am
  
- ❑ **Prerequisite:** Econ 300 with a grade of "C" or better
  
- ❑ **Course website:** [www.skchugh.com](http://www.skchugh.com) (through "Teaching" link)
  
- ❑ **Other important information:** see Syllabus

January 26, 2009

14

## LOGISTICS

- ❑ **For recitation sections THIS WEEK ONLY**
- ❑ Sections 101 AND 102 meet with Section 102
  - ❑ Thursday 9:00am-9:50am
  - ❑ **i.e., BOTH MEET IN TYDINGS HALL 1108**
- ❑ Sections 103 AND 106 meet with Section 106
  - ❑ Friday 9:00am-9:50am
  - ❑ **i.e., BOTH MEET IN TYDINGS HALL 2108**
- ❑ Sections 104 AND 105 meet with Section 105
  - ❑ Friday 11:00am-11:50am
  - ❑ **i.e., BOTH MEET IN TYDINGS HALL 1114**
- ❑ **Starting NEXT WEEK, all recitations meet in regularly-scheduled locations**

January 26, 2009

15

## REVIEW OF CONSUMER THEORY

JANUARY 26, 2009

## UTILITY FUNCTIONS

- Describe how much “happiness” or “satisfaction” an individual experiences from “consuming” goods – the **benefit** of consumption
- **Marginal Utility**
  - The extra total utility resulting from consumption of a small/incremental extra unit of a good
  - Mathematically, the (partial) slope of utility with respect to that good

## UTILITY FUNCTIONS

- Describe how much “happiness” or “satisfaction” an individual experiences from “consuming” goods – the **benefit** of consumption
- **Marginal Utility**
  - The extra total utility resulting from consumption of a small/incremental extra unit of a good
  - Mathematically, the (partial) slope of utility with respect to that good
- **One-good case:**  $u(c)$ , with  $du/dc > 0$  and  $d^2u/dc^2 < 0$ 
  - Recall interpretation: strictly increasing at a strictly decreasing rate
  - Diminishing marginal utility

## UTILITY FUNCTIONS

- Describe how much “happiness” or “satisfaction” an individual experiences from “consuming” goods – the **benefit** of consumption
- **Marginal Utility**
  - The extra total utility resulting from consumption of a small/incremental extra unit of a good
  - Mathematically, the (partial) slope of utility with respect to that good  
Alternative notation:  $du/dc$  OR  $u'(c)$  OR  $u_c(c)$  OR  $u_1(c)$
- **One-good case:**  $u(c)$ , with  $du/dc > 0$  and  $d^2u/dc^2 < 0$ 
  - Recall interpretation: strictly increasing at a strictly decreasing rate
  - Diminishing marginal utility

## UTILITY FUNCTIONS

- Describe how much “happiness” or “satisfaction” an individual experiences from “consuming” goods – the **benefit** of consumption
- **Marginal Utility**
  - The extra total utility resulting from consumption of a small/incremental extra unit of a good
  - Mathematically, the (partial) slope of utility with respect to that good  
Alternative notation:  $du/dc$  OR  $u'(c)$  OR  $u_c(c)$  OR  $u_1(c)$
- **One-good case:**  $u(c)$ , with  $du/dc > 0$  and  $d^2u/dc^2 < 0$ 
  - Recall interpretation: strictly increasing at a strictly decreasing rate
  - Diminishing marginal utility
- **Two-good case:**  $u(c_1, c_2)$ , with  $u_i(c_1, c_2) > 0$  and  $u_{ij}(c_1, c_2) < 0$  for each of  $i = 1, 2$ 
  - Utility strictly increasing in **each good** individually (partial)
  - Diminishing marginal utility in **each good** individually

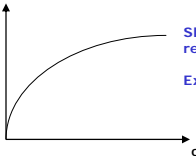
## UTILITY FUNCTIONS

- ❑ Describe how much “happiness” or “satisfaction” an individual experiences from “consuming” goods – the **benefit** of consumption
- ❑ **Marginal Utility**
  - ❑ The extra total utility resulting from consumption of a small/incremental extra unit of a good
  - ❑ Mathematically, the (partial) slope of utility with respect to that good  
Alternative notation:  $du/dc$  OR  $u'(c)$  OR  $u_c(c)$  OR  $u_1(c)$
- ❑ **One-good case:**  $u(c)$ , with  $du/dc > 0$  and  $d^2u/dc^2 < 0$ 
  - ❑ Recall interpretation: strictly increasing at a strictly decreasing rate
  - ❑ Diminishing marginal utility
- ❑ **Two-good case:**  $u(c_1, c_2)$ , with  $u_i(c_1, c_2) > 0$  and  $u_{ij}(c_1, c_2) < 0$  for each of  $i = 1, 2$ 
  - ❑ Utility strictly increasing in **each good** individually (partial)
  - ❑ Diminishing marginal utility in **each good** individually
- ❑ Readily extendable to  $N$ -good case:  $u(c_1, c_2, c_3, c_4, \dots, c_N)$

January 26, 2009

21

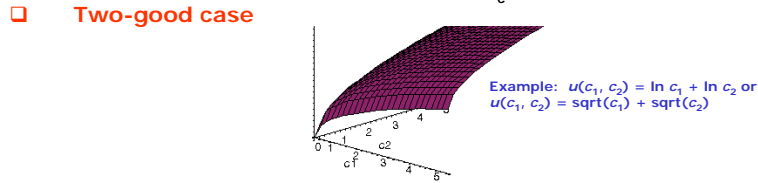
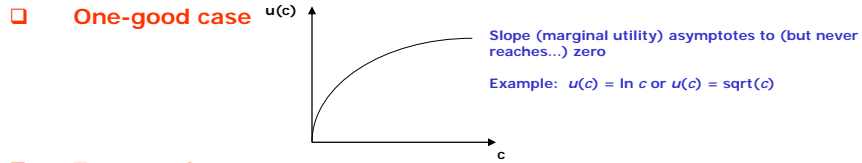
## UTILITY FUNCTIONS

- ❑ **One-good case**  $u(c)$ 

  - Slope (marginal utility) asymptotes to (but never reaches...) zero
  - Example:  $u(c) = \ln c$  or  $u(c) = \text{sqrt}(c)$

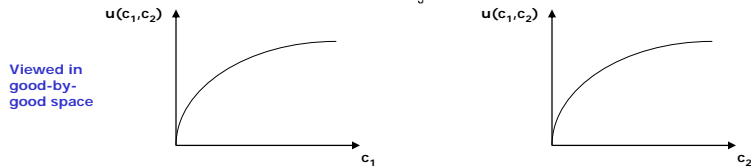
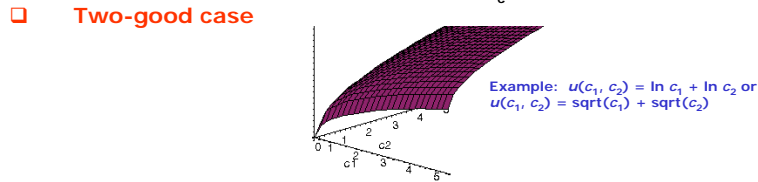
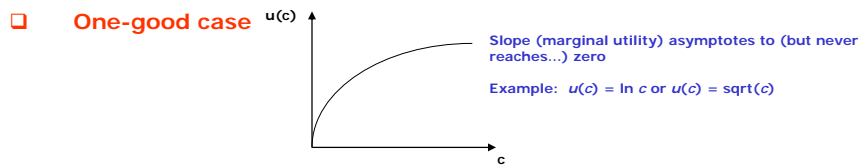
January 26, 2009

22

## UTILITY FUNCTIONS

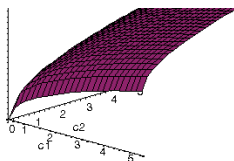


## UTILITY FUNCTIONS

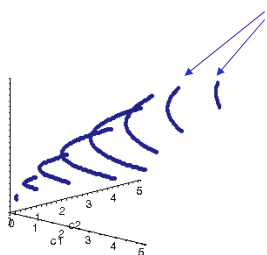


# UTILITY FUNCTIONS

## Alternative views



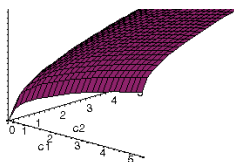
Emphasizing the contours



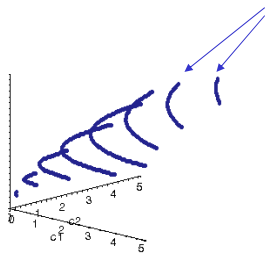
**Indifference Curve:** the set of all consumption bundles that deliver a particular level of utility/happiness

# UTILITY FUNCTIONS

## Alternative views

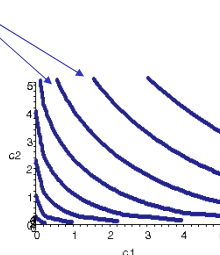


Emphasizing the contours



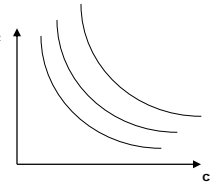
**Indifference Curve:** the set of all consumption bundles that deliver a particular level of utility/happiness

Viewing only the contours



## UTILITY FUNCTIONS

- **Marginal Rate of Substitution (MRS)**
  - **Maximum** quantity of one good consumer is **willing** to give up to obtain **one** extra unit of the other good
  - Graphically, the (negative of the) slope of  $c_2$  an indifference curve
  - MRS is itself a **function** of  $c_1$  and  $c_2$  (i.e.,  $MRS(c_1, c_2)$ )
  - **MRS equals ratio of marginal utilities**
    - $$MRS(c_1, c_2) = \frac{u_1(c_1, c_2)}{u_2(c_1, c_2)}$$
    - Using Implicit Function Theorem (see Practice Problem Set 1)

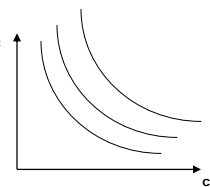


January 26, 2009

27

## UTILITY FUNCTIONS

- **Marginal Rate of Substitution (MRS)**
  - **Maximum** quantity of one good consumer is **willing** to give up to obtain **one** extra unit of the other good
  - Graphically, the (negative of the) slope of  $c_2$  an indifference curve
  - MRS is itself a **function** of  $c_1$  and  $c_2$  (i.e.,  $MRS(c_1, c_2)$ )
  - **MRS equals ratio of marginal utilities**
    - $$MRS(c_1, c_2) = \frac{u_1(c_1, c_2)}{u_2(c_1, c_2)}$$
    - Using Implicit Function Theorem (see Practice Problem Set 1)
- **Summary: whether graphically- or mathematically-formulated, utility functions describe the benefit side of consumer optimization**



January 26, 2009

28