# 180.101 Elements of Macroeconomics - TA Section

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# New time for TA office hour

**Monday, 10:30am - 11:30am**

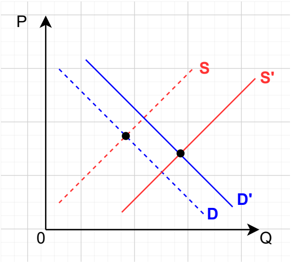
Wyman Park Building W601D

# Analysis of demand and supply

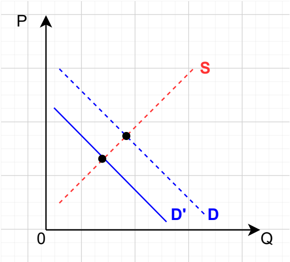
- Market at initial equilibrium $(P, Q) \rightarrow$ Exogenous forces shift demand or (and) supply curve $\rightarrow$ market reaches new equilibrium $(P', Q')$
- Preferences and seasonality
  - Shift of one curve $\rightarrow$ Q1(b)
  - Shift of both curves $\rightarrow$ Q1(a)(c)
- Related markets (substitutes and complements) $\rightarrow$ Q4(a)(b)(e)
- Income $\rightarrow$ Q4(c)(d)
- Tax and subsidy $\rightarrow$ Q2(d)
- * Price ceiling and price floor $\rightarrow$ Q2 (b)(c)
  $\Rightarrow$ shortage and surplus

# Q1

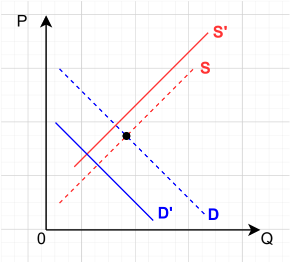
(a)




(b)

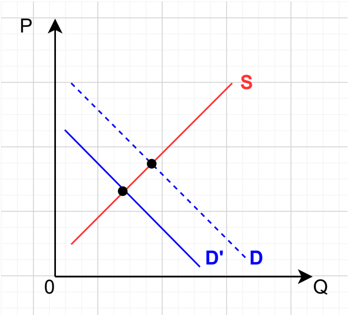



(c)

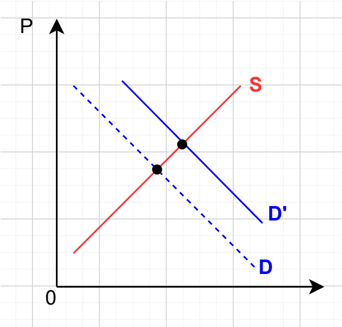


# Q4

(b)(c)(e)




(a)(d)



# Q3(a)

- When demand is D2 and supply is S1, the equilibrium price is \$3.00 per gallon.
- When demand is D2 and supply is S1, there is an excess demand of 4000 gallons per month at a price of \$1.00 per gallon.

| Price (\$) | $D_1$ | $D_2$ | $S_1$ | $S_2$ |
|---|---|---|---|---|
| 4.00 | 5000 | 7500 | 9000 | 9500 |
| 3.00 | 6000 | **8000** | **8000** | 9000 |
| 2.00 | | 8500 | | 8500 |
| 1.00 | | **9000** | **5000** | |

# Q3(a)

- If demand is D1 and supply is S1, the equilibrium quantity is 7000 gallons per month.
- If demand is D1 and supply is S2, the equilibrium quantity is 8000 gallons per month.

| Price ($) | $D_1$ | $D_2$ | $S_1$ | $S_2$ |
|---|---|---|---|---|
| 4.00 | 5000 | 7500 | 9000 | 9500 |
| 3.00 | 6000 | 8000 | 8000 | 9000 |
| 2.00 | 7000 | 8500 | 7000 | 8500 |
| 1.00 | 8000 | 9000 | 5000 | 8000 |

# Annualized growth rate

**Q**: At $t_1$, GDP of an island is $T_1$. At $t_2$, the island's GDP is $T_2$ $(t_2 > t_1)$. What is the **annualized** GDP growth rate for the island from $t_1$ to $t_2$?
**A**: Denote the annualized GDP growth rate as y%. Then:

$$(1 + y\%)^{\frac{n}{q}} = \frac{T_2}{T_1}$$

$$\Rightarrow y = \left[ \left( \frac{T_2}{T_1} \right)^{\frac{q}{n}} - 1 \right] * 100$$

$q$: number of periods that fit in a year, i.e., 12 periods for monthly
$n$: number of periods covered in the calculation
Example:if $(t_2 - t_1) = 2$ months, then $q = 12$, $n = 2$

# Gross Domestic Product (GDP)

- **The total value of final goods and service produced within the border of the country over a period of time**.
  - Gross: Does not deduct depreciation.
  - Value: GDP is in monetary value, instead of in the units of the products.
  - Final: Does not include intermediate. Includes inventory (even if it does not get sold).
  - Over a period of time: GDP is a **flow** concept

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  - Over a period of time: GDP is a **flow** concept
- **Flow**: change from a point in time to another, e.g. income this year, consumption last year, investment from 2022Q1 to 2023Q1, etc.
- **Stock**: level at a particular point in time, e.g. personal/national wealth, capital stock, etc.

# Limitations of GDP

- Does not preclude including informal economy and illicit activities, but very hard to measure in reality
- Does not include non-market activities such as housework and childcare.
- Does not take into account a wide range of factors that affect welfare, e.g. environmental pollution, subjective happiness, etc.
- Says nothing about the income distribution.
- Says nothing about the efficiency use of the resources.

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**"Distinctions must be kept in mind between quantity and quality of growth, between costs and returns, and between the short and long run. Goals for more growth should specify more growth of what and for what."**

*Simon Kuznets. "How To Judge Quality". 1962*

# Other measures

- **Gross National Product (GNP)**: includes production by domestic residents/firms outside of the country and excludes production by foreign residents/firms within the country
  *Example*: GM produces a car in Mexico $\rightarrow$ GDP of Mexico, GNP of US

# Other measures

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- **Net National Product (NNP)** = GNP - Depreciation (CFC)
- **National Income(NI)** = GDP - Depreciation (CFC)
- **Personal Income(PI)**: income received by households
  PI = NI - corporation-retained earnings + govt transfers and govt bonds interest
- **Disposable Personal Income** = Personal Income - *personal* tax payments
- BEA Glossory: `https://www.bea.gov/index.php/help/glossary`