

Dynamic General Equilibrium Model with Investment

ECO 305: Intermediate Macroeconomics

Goals

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- 1 Bring everything together to build an inter-dependent micro-founded model of the macroeconomy
- 2 Determine equilibrium outcomes for wages, interest rates, employment, real GDP, consumption, saving, and investment
- 3 Use a model based on the consumer utility maximizing models and profit maximizing models that we have seen

Reading and Exercises

2 / 10

- Competitive general equilibrium in the two-period dynamic model - Chapter 11, pp. 401-414
- Dynamics macroeconomic effects from changes in government expenditures - Chapter 11, pp. 414-417
- Dynamics macroeconomic effects from changes in capital stock - Chapter 11, pp. 417-421
- Dynamics macroeconomic effects from changes in total factor productivity - Chapter 11, pp. 421-425
- **Canvas Quiz due Wed 11:59 PM.**
Multiple-choice, 10 questions, unlimited attempts allowed, only best score counts
- **Homework/Exercise due Fri 11:59 PM.** We will work together in class on Thursday

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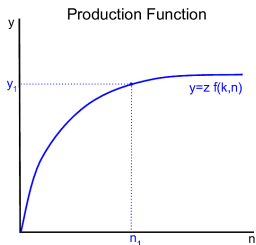
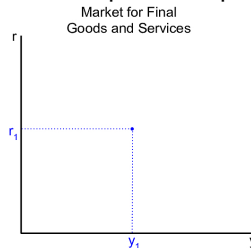
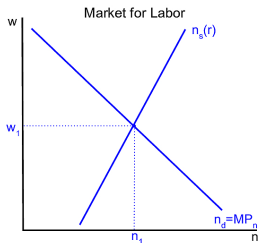
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Output Supply

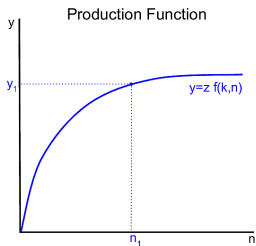
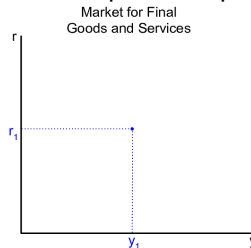
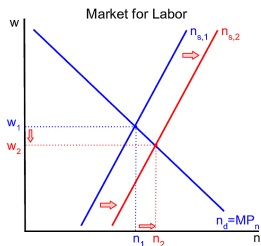
Suppose the interest rate increases. Find shape of output supply.



Output Supply

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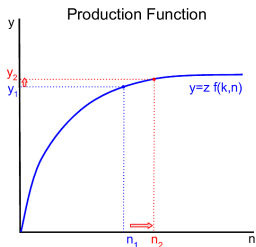
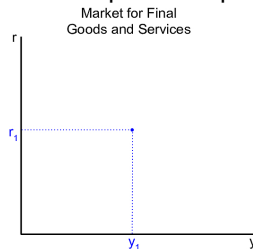
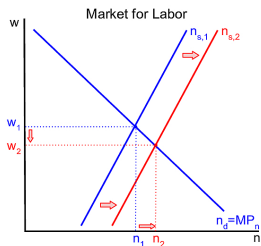
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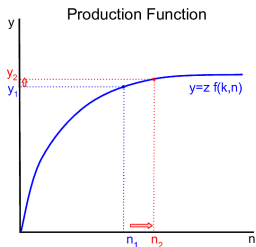
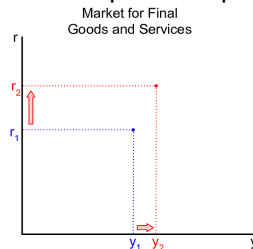
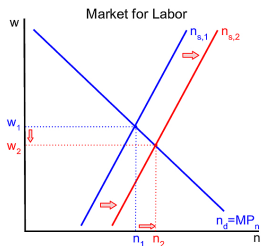
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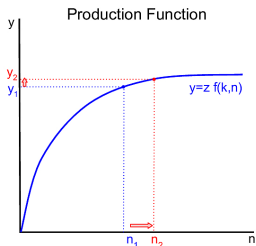
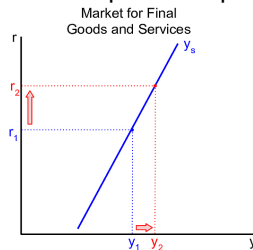
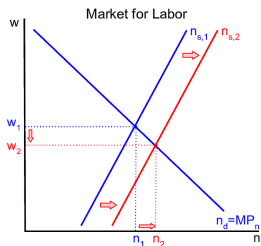
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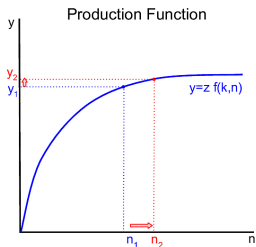
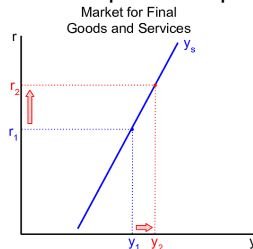
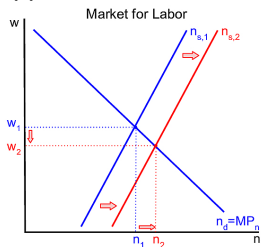
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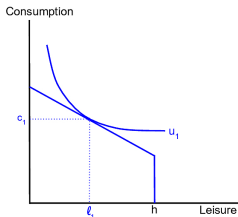
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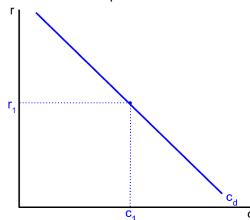
- Aggregate leisure/labor supply decisions likely very inelastic to interest rates
- Consumption/Leisure model determines any shifts in n_s
- Leisure present/future model also determines n_s
- Shifts in n_d depend on labor productivity, capital stock, current total factor productivity (z)

Consumption Demand

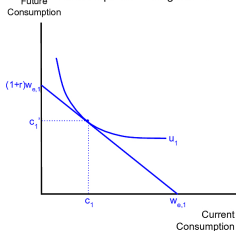
Consumption / Leisure Model



Consumption Demand



Future Consumption / Saving Model

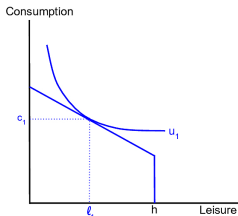


- Consumption/Leisure model predictions can lead to shifts in c_d
- Consumption/Saving model predictions can lead to shifts in c_d
- Focus on *exogenous variables*: taxes (t, t'), dividends (π, π'), *expectations* about future (y', t')
- Focus on substitution effects

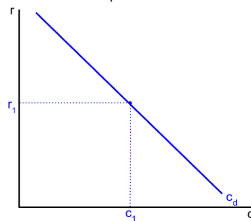
Consumption Example: Decrease in NPV Taxes

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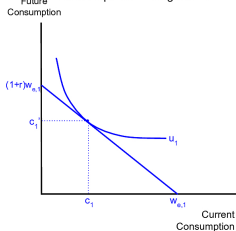
Consumption / Leisure Model



Consumption Demand

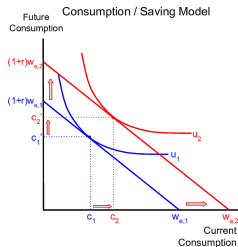
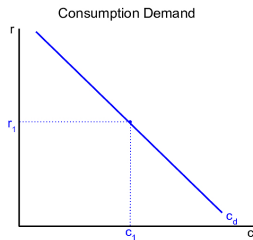
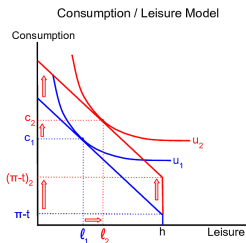


Future Consumption / Saving Model



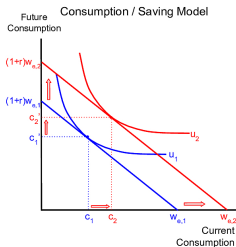
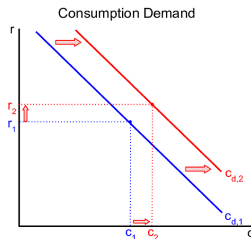
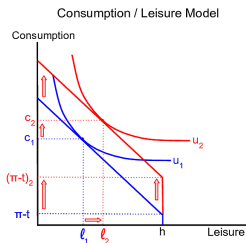
- Decrease in taxes shifts budget constraint outward in both models

Consumption Example: Decrease in NPV Taxes



- Decrease in taxes shifts budget constraint outward in both models
- Increase in current period consumption

Consumption Example: Decrease in NPV Taxes

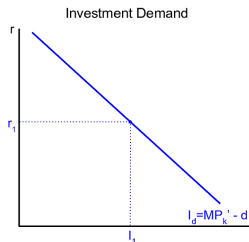


- Decrease in taxes shifts budget constraint outward in both models
- Increase in current period consumption
- Consumption demand shifts to the right

Investment Demand

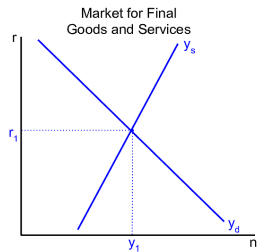
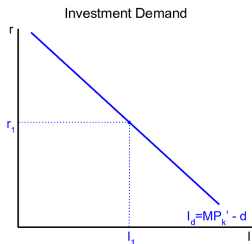
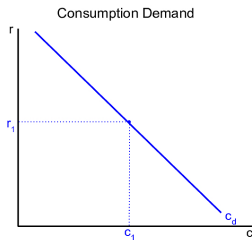
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- Investment demand depends on firm profit maximization
- Depends on future capital productivity
- Depends on expectations of future total factor productivity (z')
- Depends on changes in current capital stock

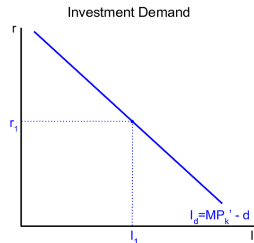
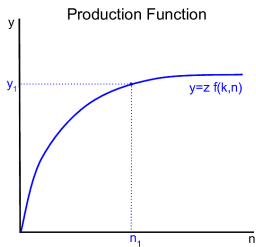
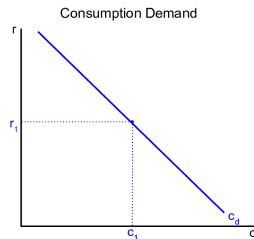
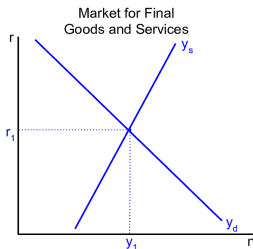
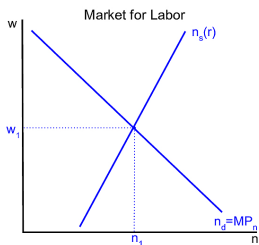


Output Demand

Output demand = consumption + investment + gov spending



General Equilibrium Model



Problems: Changes in Productivity

Describe and illustrate all the general equilibrium outcomes resulting from the following changes to the economy:

- 1 There is a temporary improvement in productivity (eg: decrease in global energy prices)
- 2 There is an expected improvement in technology coming in the future.
- 3 There is a permanent improvement in total factor productivity.

Problems: Changes in Fiscal Policy

Describe and illustrate all the general equilibrium outcomes resulting from the following changes to the economy:

- 1 There is a decrease in current taxes, with a planned decrease in future government spending.
- 2 There is an increase in current government spending, with no change in current taxes or future government spending.