Economics 302
Intermediate Macroeconomic Theory and Policy
(Spring 2010)

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Lecture 4

Monday, February 1, 2010

Outline

- Overview/Recap
- Definitions
- Multipliers
- What about taxes, transfers?
- Imports, Exports

Overview

- We want to build up a general model where supply and demand determine output, and (over time) price level.
- To begin with, we simplify by:

  - Holding the price level constant (so demand completely determines output)

  - Ignore the financial side of the economy

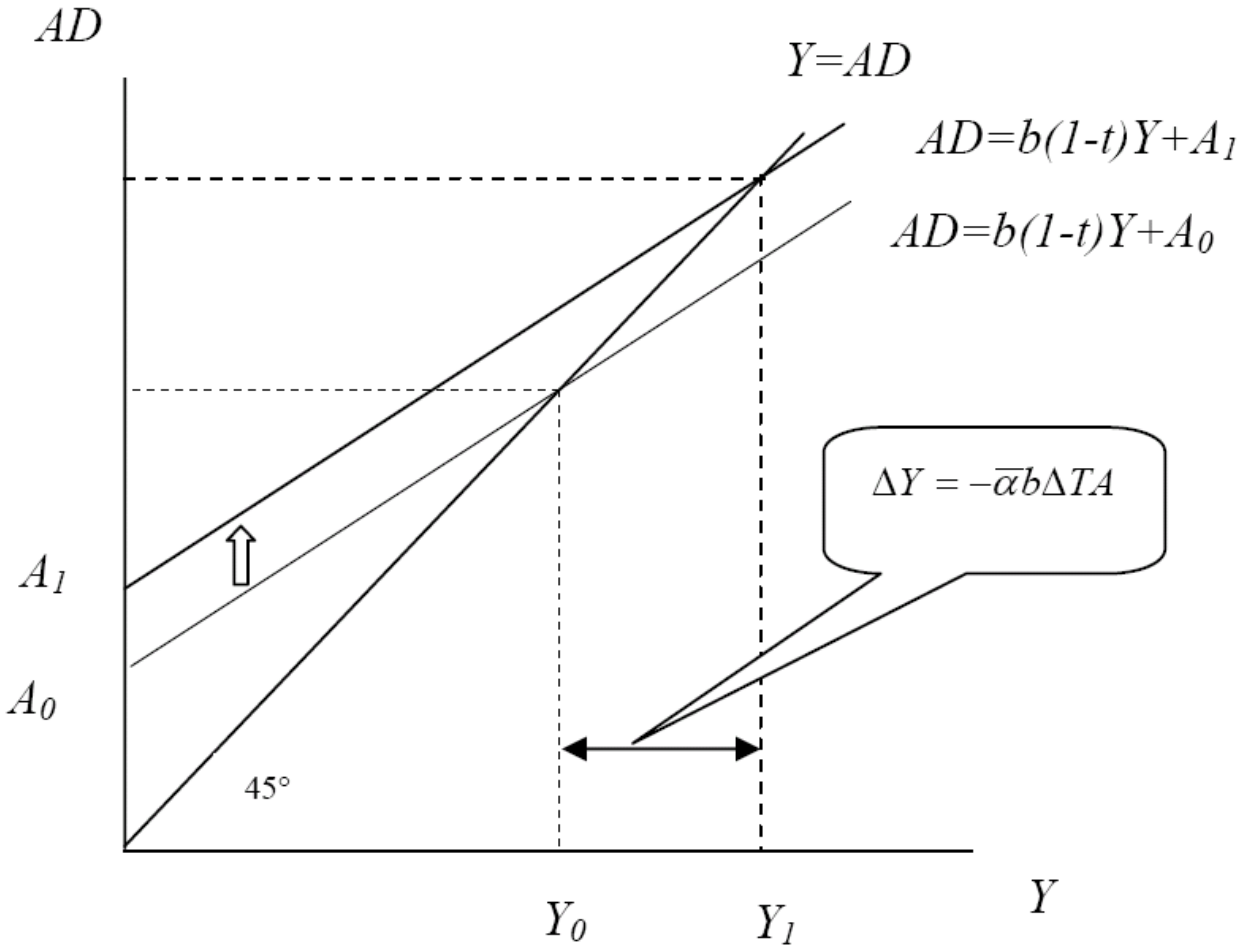
Recap: the Keynesian Model

Eq.No.	Equation	Description
(1)	$Y = AD$	Output equals aggregate demand, an equilibrium condition
(2)	$AD = C + I + G + X$	Definition of aggregate demand
(3)	$C = a_o + bY_d$	Consumption function, b is the mpc
(4)	$Y_d \equiv Y - T$	Definition of disposable income
(5)	$T = TA_0 + tY$	Tax function; TA_0 is lump sum taxes, t is marginal tax rate.
(6)	$I = IN_0$	Investment function, exogenous
(7)	$G = GO_0$	Government spending on goods and services, exogenous
(8)	$X = g_0$	Net Exports, exogenous

Definitions

- Parameters: relate the behavior of two variables
- Endogenous variables: variables determined within the system of equations
- Exogenous variables: variables determined outside the system of equations
- Autonomous spending: a_0 , IN_0 , GO_0 , g_0

Fiscal Policy (Lump Sum Tax Cut)



Multipliers

$$Y_0 = \overline{\alpha}[a_0 - bTA_0 + IN_0 + GO_0 + g_0]$$

$$\Delta Y = \overline{\alpha}[\Delta a - b\Delta TA + \Delta IN + \Delta GO + \Delta g]$$

$$\Delta Y = \overline{\alpha}\Delta GO$$

$$\Delta Y = \overline{\alpha}(-b\Delta TA)$$

$$==> \Delta Y / \Delta GO = \overline{\alpha}$$

$$==> \Delta Y / \Delta TA = -\overline{\alpha}b$$

Multipliers (II)

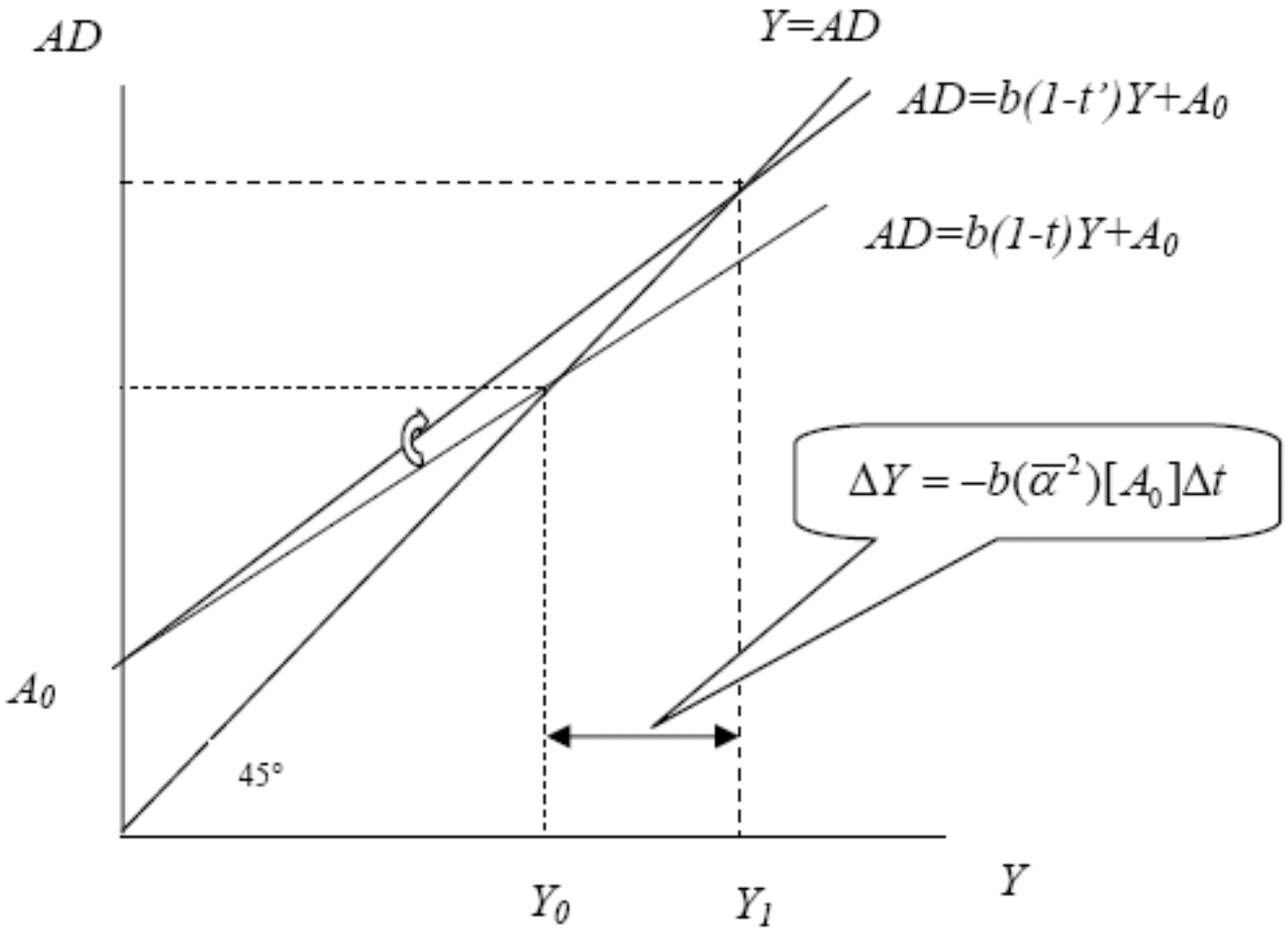
$$\Delta Y = \overline{\alpha}\frac{\partial A}{\partial t}\Delta t + \frac{\partial \overline{\alpha}}{\partial t}[A_0]\Delta t$$

$$\frac{\partial \overline{\alpha}}{\partial t} = (-1)\times\left(\frac{1}{1-b(1-t)+m}\right)^2 \times (b)$$

$$\Delta Y = \frac{\partial \overline{\alpha}}{\partial t}[A_0]\Delta t = -b(\overline{\alpha}^2)[A_0]\Delta t$$

$$\frac{\Delta Y}{\Delta t} = -b(\overline{\alpha}^2)[A_0]$$

Fiscal Policy, Tax Rate Cut



(corrected 9/15)

Estimates of Multipliers

Fiscal Bang for the Buck

One-year $ change in real GDP per $ reduction in federal tax revenue or increase in spending

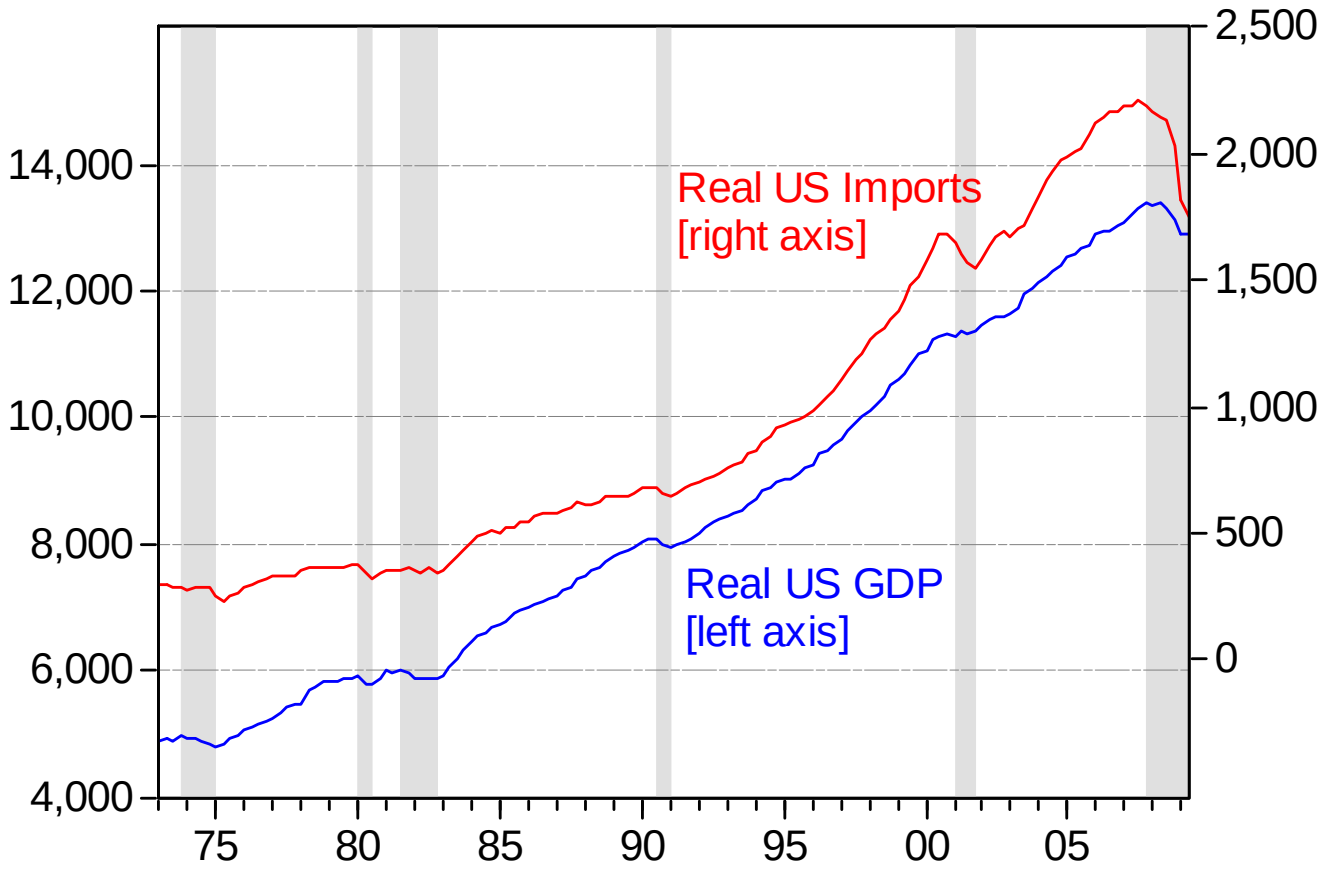
Tax Cuts	
Nonrefundable Lump-Sum Tax Rebate	1.02
Refundable Lump-Sum Tax Rebate	1.26
Temporary Tax Cuts	
Payroll Tax Holiday	1.29
Across the Board Tax Cut	1.03
Accelerated Depreciation	0.27
Permanent Tax Cuts	
Extend Alternative Minimum Tax Patch	0.48
Make Bush Income Tax Cuts Permanent	0.29
Make Dividend and Capital Gains Tax Cuts Permanent	0.37
Cut Corporate Tax Rate	0.30
Spending Increases	
Extend Unemployment Insurance Benefits	1.64
Temporarily Increase Food Stamps	1.73
Issue General Aid to State Governments	1.36
Increase Infrastructure Spending	1.59

Source: Moody's Economy.com

Import Function

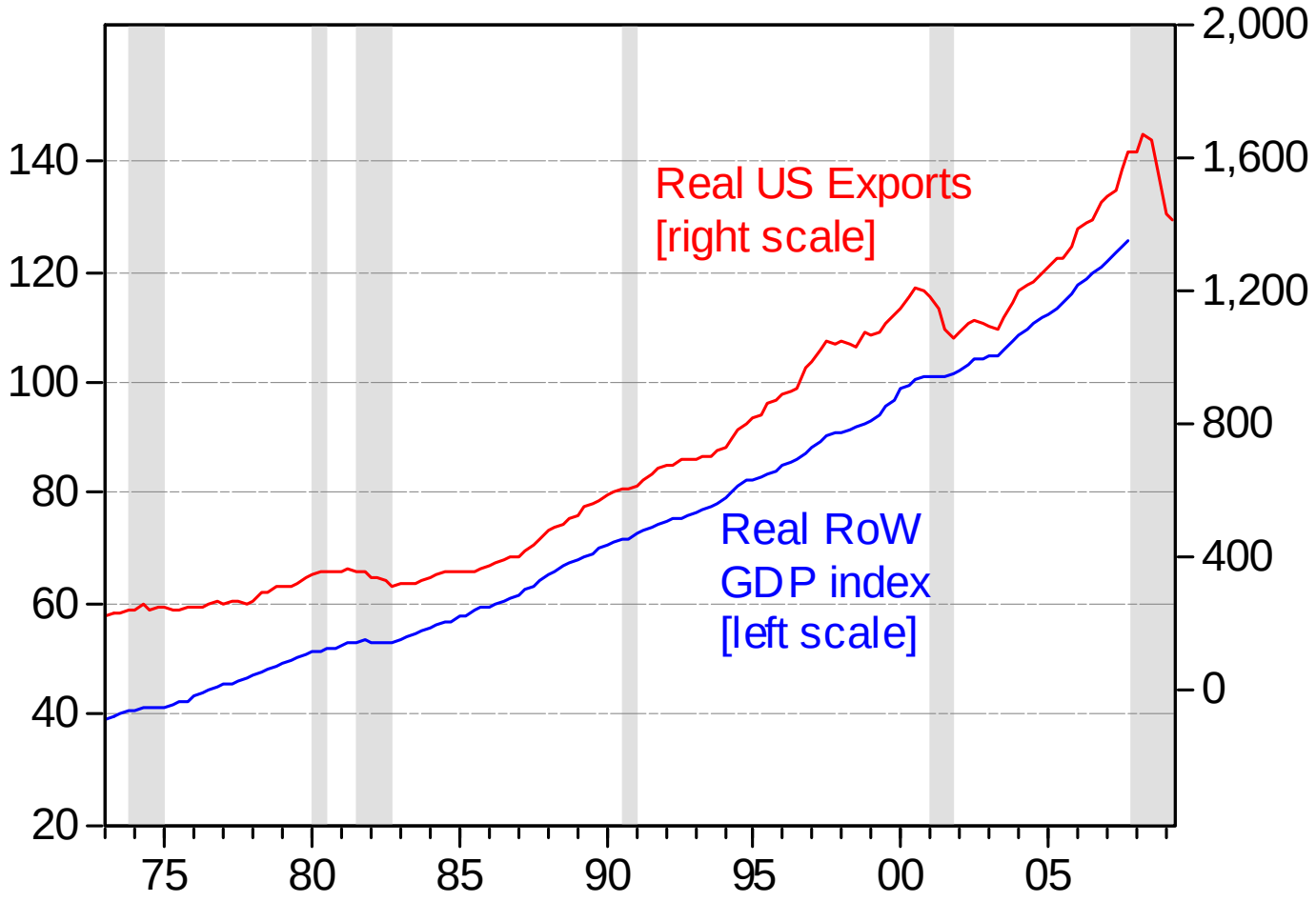
- A more realistic net exports function – imports?

$$X = g_0 - mY$$



Source: BEA, 09Q2 BEA 2nd release

Export Function?



Source: BEA, 09Q2 GDP 2nd release; Federal Reserve Board

Parameter Estimates for the Multiplier

Dependent Variable: CONS05
Method: Least Squares
Date: 01/28/10 Time: 21:36
Sample: 1973Q1 2009Q3
Included observations: 147

	Coefficient	Std. Error	t-Statistic	Prob.
C	-473.0770	25.67634	-18.42463	0.0000
GDP05	0.729703	0.002854	255.6587	0.0000

R-squared	0.997786	Mean dependent var	5783.759
Adjusted R-squared	0.997771	S.D. dependent var	1994.715
S.E. of regression	94.17064	Akaike info criterion	11.94161
Sum squared resid	1285876.	Schwarz criterion	11.98229
Log likelihood	-875.7080	Hannan-Quinn criter.	11.95814
F-statistic	65361.37	Durbin-Watson stat	0.151970
Prob(F-statistic)	0.000000		

Dependent Variable: IMPGS05
Method: Least Squares
Date: 01/28/10 Time: 21:38
Sample: 1973Q1 2009Q3
Included observations: 147

	Coefficient	Std. Error	t-Statistic	Prob.
C	-1011.315	30.87149	-32.75886	0.0000
GDP05	0.229163	0.003432	66.77821	0.0000

R-squared	0.968508	Mean dependent var	953.6442
Adjusted R-squared	0.968291	S.D. dependent var	635.8385
S.E. of regression	113.2244	Akaike info criterion	12.31013
Sum squared resid	1858866.	Schwarz criterion	12.35082
Log likelihood	-902.7947	Hannan-Quinn criter.	12.32666
F-statistic	4459.329	Durbin-Watson stat	0.048244
Prob(F-statistic)	0.000000		

$b(1\text{-}t) = 0.73$

$m = 0.23$

$$\overline{\alpha} \equiv \left(\frac{1}{1 - b(1-t) + m} \right)$$

$$= \left(\frac{1}{1 - 0.73 + 0.23} \right)$$

$$= 2$$