

Economics 302
Intermediate Macroeconomic
Theory and Policy
(Fall 2010)

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Lecture 4

Monday, September 20, 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

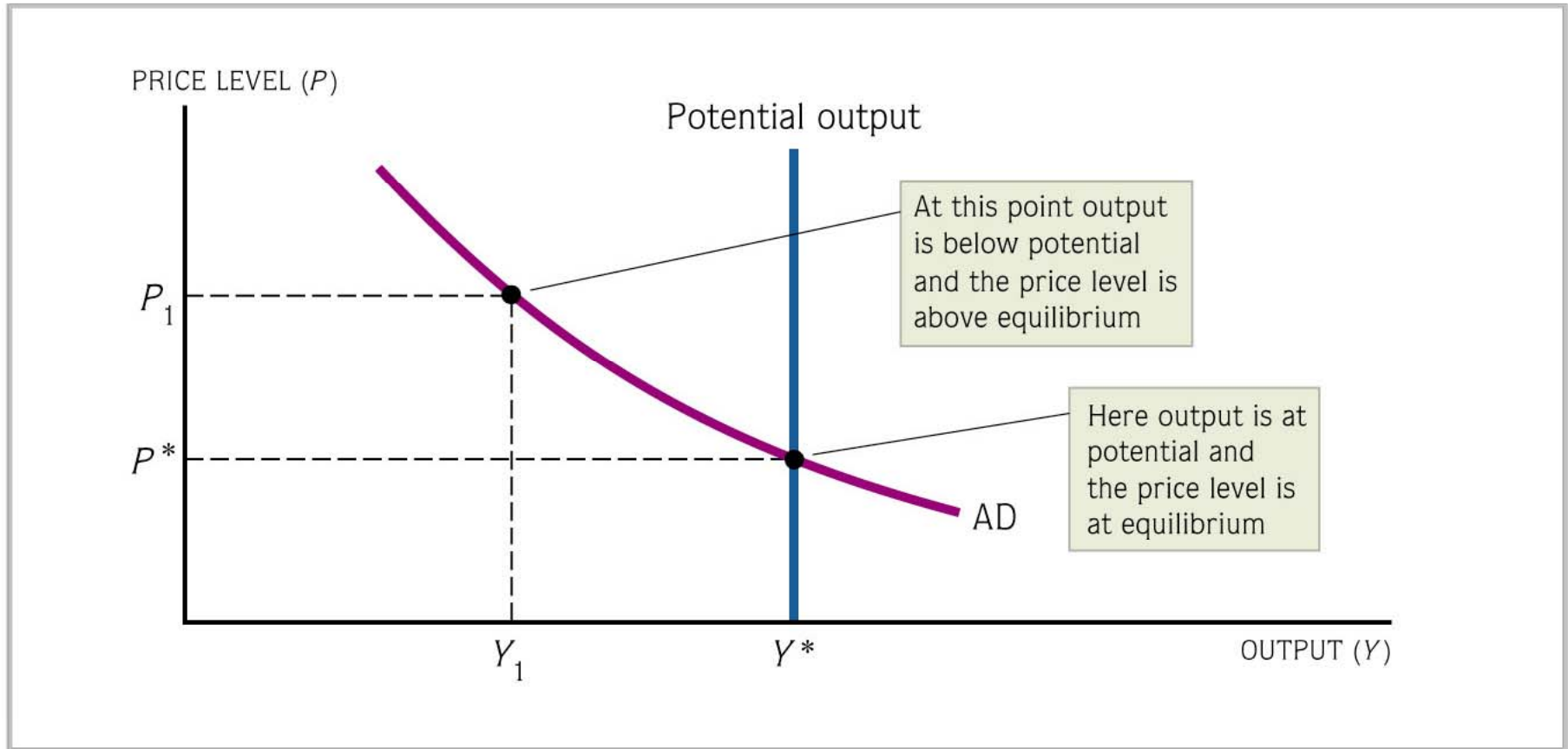


FIGURE 7.1 The Aggregate Demand (AD) Curve

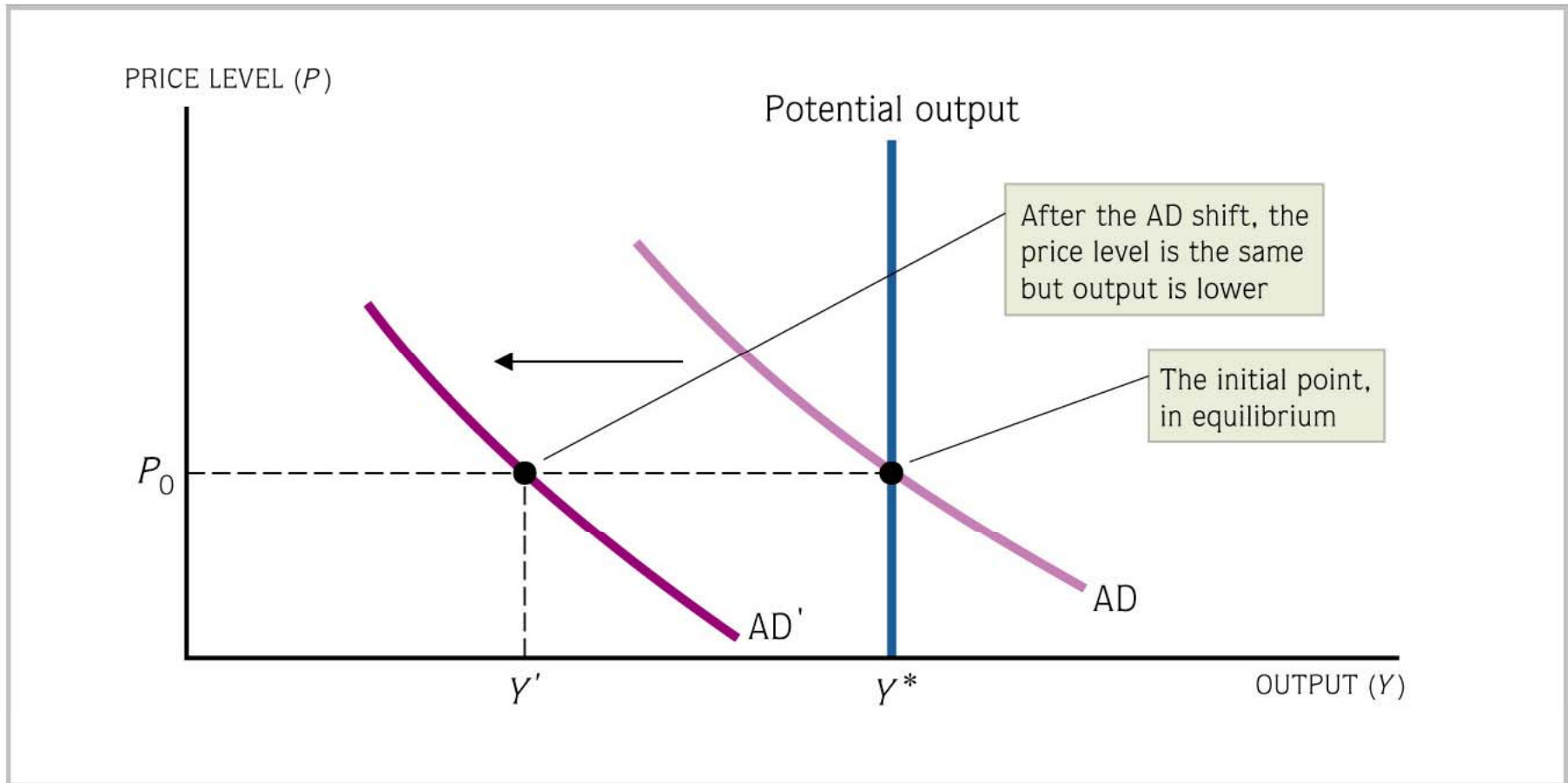


FIGURE 7.2 Output Declines When AD Shifts Inward

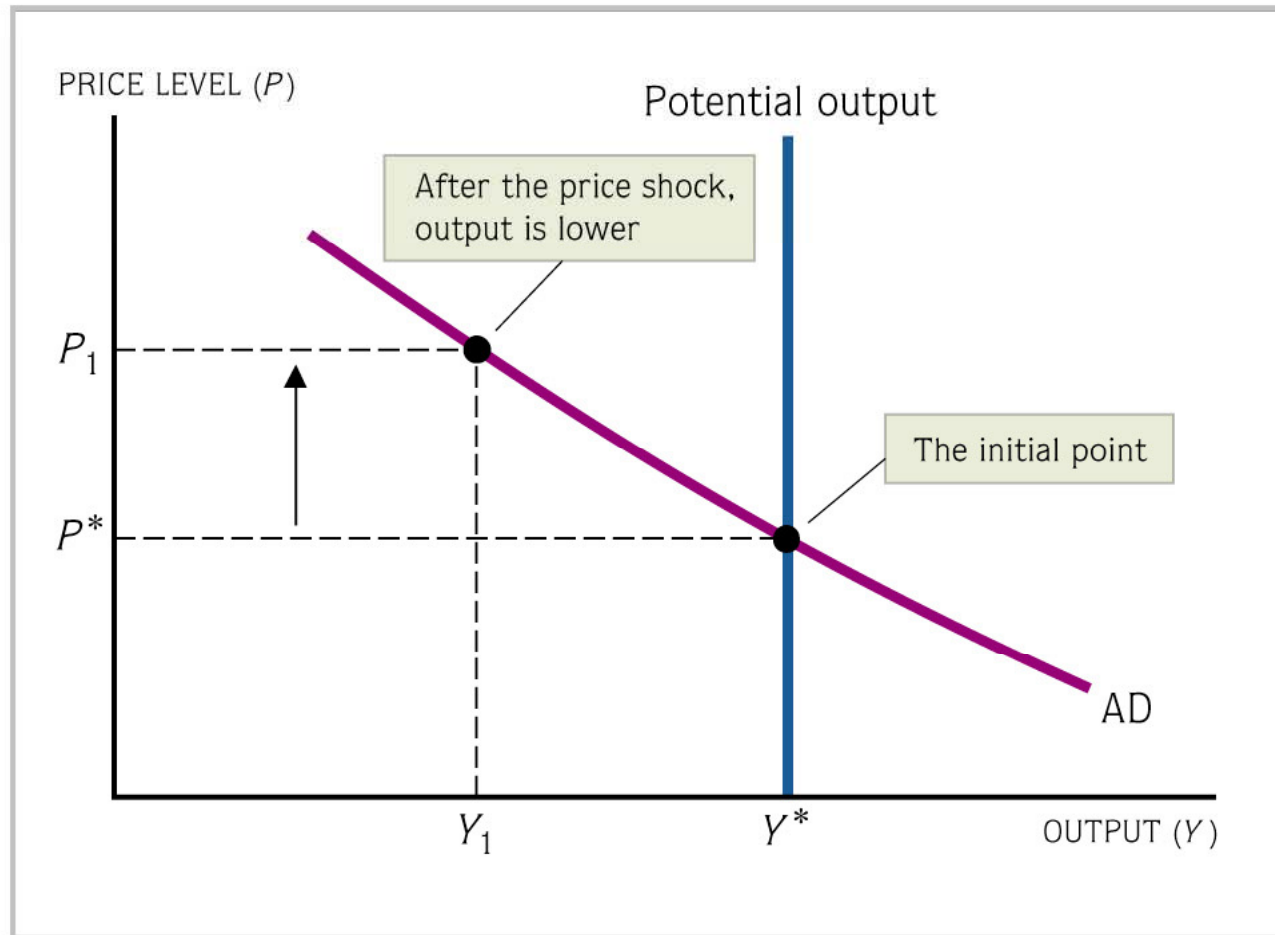


FIGURE 7.3 A Price Shock

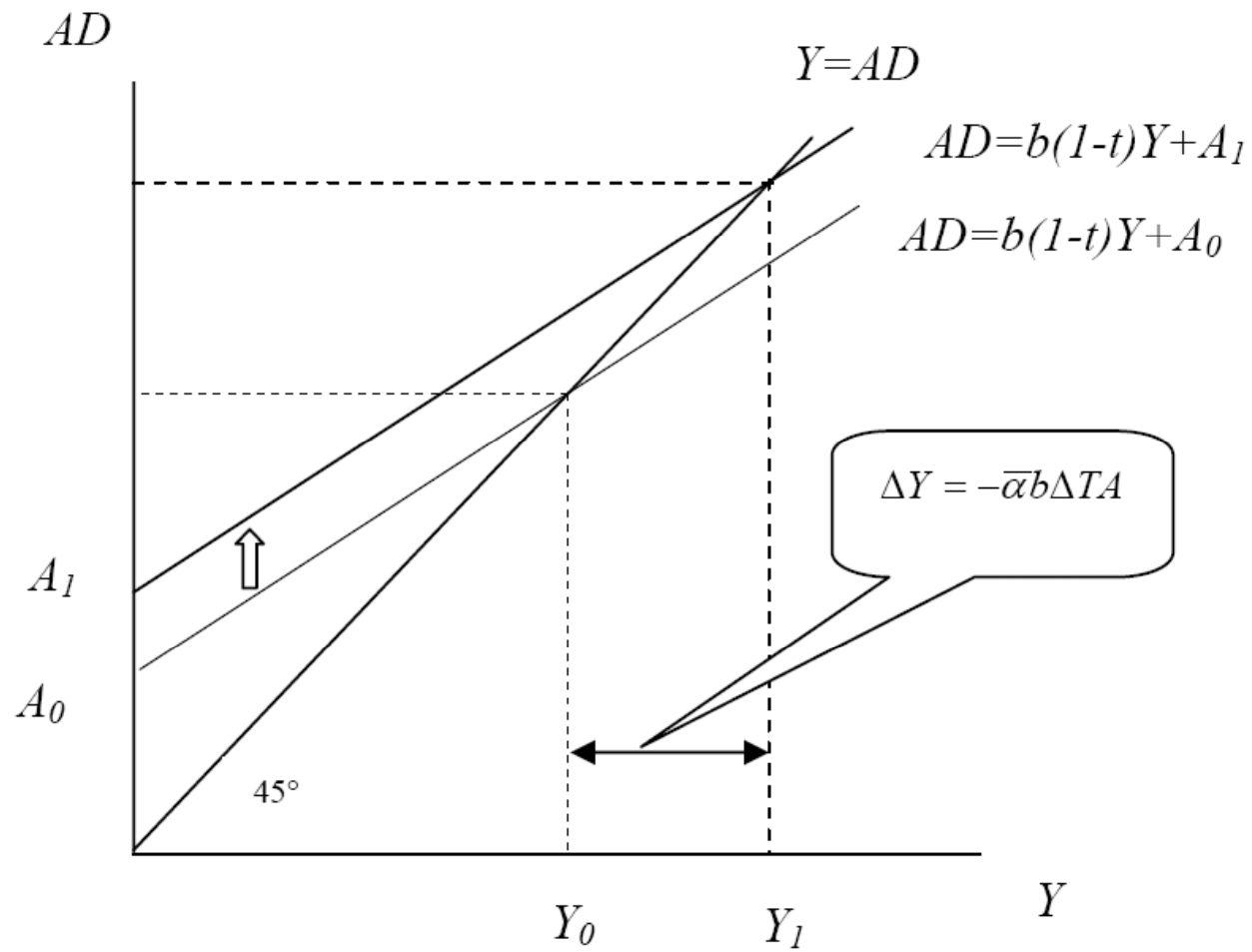
Recap: the Keynesian Model

<u>Eq.No.</u>	<u>Equation</u>	<u>Description</u>
(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

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

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

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

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

$$\implies \Delta Y / \Delta GO = \bar{\alpha}$$

$$\implies \Delta Y / \Delta TA = -\bar{\alpha}b$$

Multipliers (II)

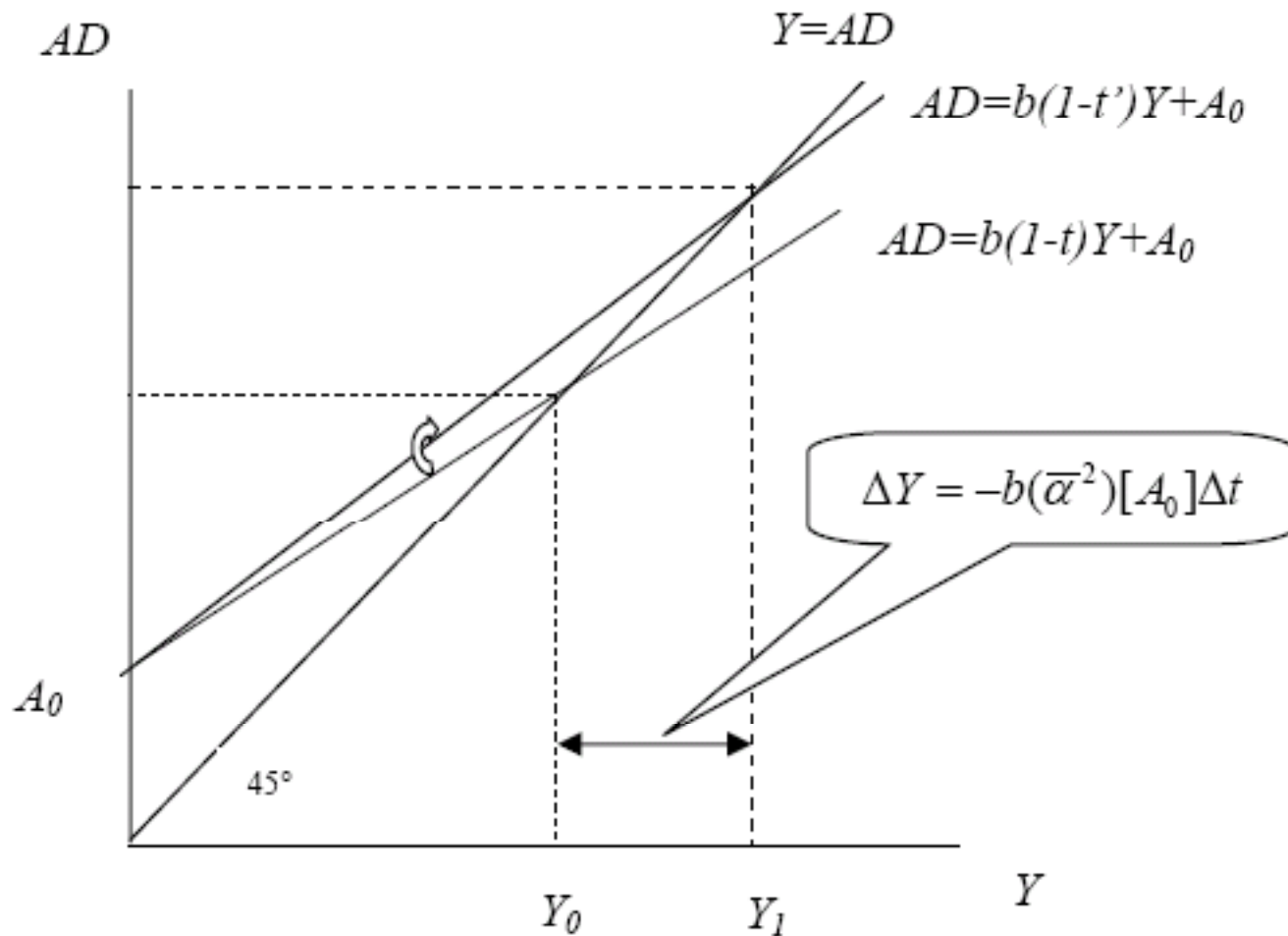
$$\Delta Y = \bar{\alpha} \frac{\partial A}{\partial t} \Delta t + \frac{\partial \bar{\alpha}}{\partial t} [A_0] \Delta t$$

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

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

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

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

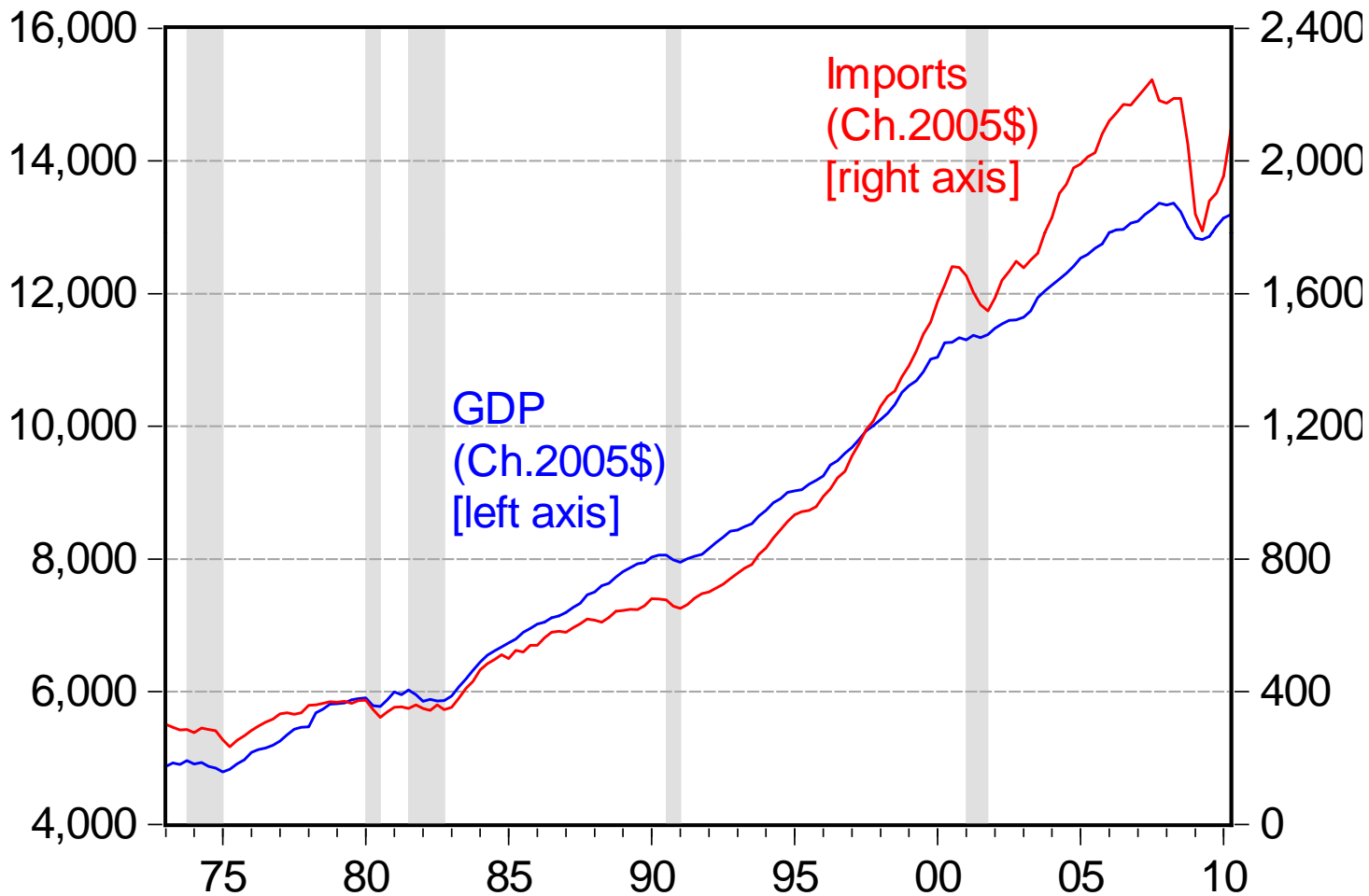
Extend Unemployment Insurance Benefits	1.64
Temporarily Increase Food Stamps	1.73
Issue General Aid to State Governments	1.36
Increase Infrastructure Spending	1.59

Source: Moody's Economy.com

Import Function

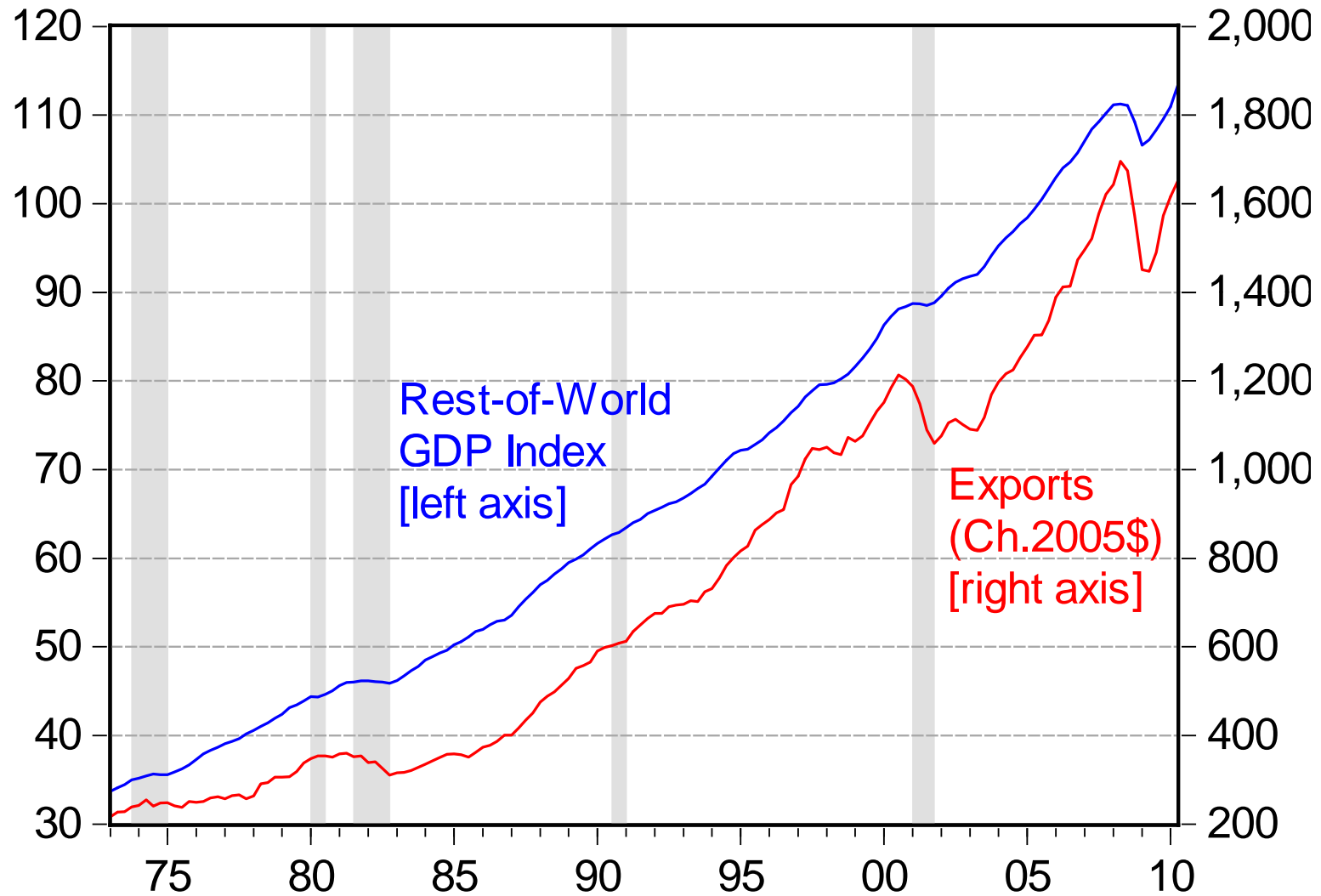
- A more realistic net exports function – imports?

$$X = g_0 - mY$$



Source: BEA, 10Q2 BEA 2nd release

Export Function?



Source: BEA, 10Q2 GDP 2nd release; Federal Reserve Board; *Economist*

Dependent Variable: CONS05
 Method: Least Squares
 Date: 09/19/10 Time: 14:48
 Sample: 1973Q1 2010Q2
 Included observations: 150

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-485.6763	25.63569	-18.94532	0.0000
GDP05	0.731539	0.002820	259.3829	0.0000
R-squared	0.997805	Mean dependent var		5849.796
Adjusted R-squared	0.997790	S.D. dependent var		2028.173
S.E. of regression	95.34099	Akaike info criterion		11.96604
Sum squared resid	1345306.	Schwarz criterion		12.00618
Log likelihood	-895.4530	Hannan-Quinn criter.		11.98235
F-statistic	67279.48	Durbin-Watson stat		0.140716
Prob(F-statistic)	0.000000			

Dependent Variable: IMPGS05
 Method: Least Squares
 Date: 09/19/10 Time: 14:48
 Sample: 1973Q1 2010Q2
 Included observations: 150

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1022.541	30.44391	-33.58769	0.0000
GDP05	0.230778	0.003349	68.90385	0.0000
R-squared	0.969770	Mean dependent var		976.1089
Adjusted R-squared	0.969565	S.D. dependent var		649.0097
S.E. of regression	113.2231	Akaike info criterion		12.30984
Sum squared resid	1897282.	Schwarz criterion		12.34998
Log likelihood	-921.2381	Hannan-Quinn criter.		12.32615
F-statistic	4747.741	Durbin-Watson stat		0.061468
Prob(F-statistic)	0.000000			

Parameter Estimates for the Multiplier

$$b(1-t) = 0.73$$

$$m = 0.23$$

$$\begin{aligned} \bar{\alpha} &\equiv \left(\frac{1}{1 - b(1-t) + m} \right) \\ &= \left(\frac{1}{1 - 0.73 + 0.23} \right) \\ &= 2 \end{aligned}$$