

Travis Moore

ECN100: Section A — Summer 2016

Instructor: Liliana Halim Lawrence

Homework Week 9

Economic Growth and Fiscal Policy

1) Use Rule 70 to answer the following:

a) How many years will it take for income to double if a country's total income grows at 2%? At 4%? At 6%?

Rule of 70 = Doubling time for a variable = $70 / \% \text{ growth rate}$

2%	4%	6%
$70 / 2\% = 35 \text{ years}$	$70 / 4\% = 17.5 \text{ years}$	$70 / 6\% = 11.67 \text{ years}$

b) If a country's income doubles in 16 years, at what rate is its income growing?

Rule of 70 = Doubling time for a variable = $70 / \% \text{ growth rate}$

16 years = $70 / \% \text{ growth rate}$

$\% \text{ growth rate} = 70 / 16 \text{ years}$

4.375%

c) In 2003 per capita output in the US was about \$35,000. If real income per capita is growing at 2% annual rate, what will per capita output be in 35 years? In 70 years?

Growth Formula = $P(1 + g)^n$

35 years	70 years
$35000(1.02)^{35}$	$35000(1.02)^{70}$
\$69,996.13	\$139,984.54

d) If real income is rising at an annual rate of 4% per year and the population is growing at a rate of 1% per year, how many years will it take to double the per capita income?

Rule of 70 = Doubling time for a variable = $70 / \% \text{ growth rate}$

4%

$70 / 4\% = 17.5$

2) Country A's output per worker (Y/L) grows by 5%, while its human capital per worker (H/L) grows by 4% and its physical capital per worker (K/L) grows by 3%. An Economist estimates the aggregate production function of this economy as follows: $Y/L = (K/L)^{0.4} \times (H/L)^{0.6} \times T$. Using Accounting for Growth, calculate:

a) the contribution (%) of physical capital to the total output per worker.

$(K/L)^{0.4}$

$(0.4(3\%))$

1.2%

b) the contribution (%) of human capital to the total output per worker.

$$(H/L)^{0.4}$$

$$(0.6(4\%))$$

$$2.4\%$$

c) the contribution (%) of technology, or the total factor productivity (TFP).

$$Y/L = T * (K/L)^{0.4} * (H/L)^{0.6}$$

$$5\% - (0.4(3\%)) - (0.6(4\%))$$

$$5\% - 1.2\% - 2.4\%$$

$$1.4\%$$

3) Sustainability and You

a) Give three examples of environmental policies that might help to support the long-run economic growth in a country, and to have a sustainable economic growth.

Sustainable consumption and production environmental policies, policies regarding natural resource protection, and policies regarding climate change and energy are all examples of policies that can help support the long-run economic growth and sustainable economic growth of a country.

b) About yourself: state three things you can do to support a sustainable future for our next generation.

Three things that I can do to support a sustainable future for our next generation are to be conscious of my purchases, such as buying goods that are recycled or sustainably harvested, vote for government officials and policies that support sustainability, and lastly reduce my consumption of goods that are wasteful in general.

4. Consider an economy that is initially in the long-run equilibrium where SRAS and AD intersection (the short-run macro equilibrium) is exactly on the LRAS – which means that the real output (Y_e) equals the potential output (Y_p). Assess the following separate events, write down with “negative/positive demand/supply shock” and each effect on the aggregate price and GDP, and what it creates (recessionary gap or inflationary gap):

a) the economy’s central bank decreases government spending.

Negative Demand Shock, price and GDP both decrease.

b) productivity decreases in the economy.

Negative Supply Shock, price goes up while GDP decreases.

c) consumer confidence in the economy increases.

Positive Demand Shock, price and GDP both increase.

d) commodity prices fall dramatically.

Positive Supply Shock, price falls, while GDP increases.

5) For each of the following situations identify whether it is an example of expansionary fiscal policy or contractionary fiscal policy:

a) As the economy enters a recession, income and consumption falls, government gave a tax rebate to families.

Expansionary Fiscal Policy

b) In light of projected deficiencies in aggregate demand, the government authorize an expenditure of \$200 million in order to build a new dam.

Expansionary Fiscal Policy

c) Fearing too rapidly expanding economy, a government adopts a budget that calls for 10% spending cuts in all government departments for the following fiscal year.

Contractionary Fiscal Policy

d) Budget on unemployment benefits rise 5% in response to rising unemployment.

Expansionary Fiscal Policy

For the following problems:

- \$budget spent on fiscal policy \times the multiplier = the change in AD (eventually on GDP);
- If the fiscal policy is in the form of "Govt Spending" or "G": use multiplier: $1 / 1 - (MPC \times (1-t))$;
- If the fiscal policy is in the form of Taxes or Transfers ("T or TR"): use multiplier: $MPC / 1 - (MPC \times (1-t))$.

6. Suppose Macroland is experiencing a recessionary gap in its economy. Its MPC is around 0.6; average tax rate is 25%.

a) The government wishes to produce at its potential output level (Y_p), and the recessionary gap was estimated around \$500 billion. Calculate the amount of budget needs to be allocated to conduct each of the following fiscal policy to close that gap:

(i) the government gives tax exemptions on consumers and corporations.

Changes in T = $MPC / [1 - (MPC \times (1-t))]$

$0.6 / [1 - (0.6(1 - 0.25))]$

0.6 / 0.55

1.09

\$500 billion / 1.09

\$458.72 billion

(ii) the government authorizes new spending programs for infrastructure.

Changes in $G = 1 / [1 - (MPC * (1-t))]$

$1 / [1 - (0.6(1 - 0.25))]$

1 / 0.55

1.82

\$500 billion / 1.82

\$274.73 billion

b) Calculate the change in GDP (increase or decrease, and by how much), with each of the following fiscal policy.

(i) the government authorize an expenditure of \$200 million in order to build a new dam.

Changes in $G = 1 / 1 - MPC$

$1 / (1 - 0.6)$

1 / 0.4

2.5 multiplier

200 million * 2.5 = 500 million; 300 million increase

(ii) During 2008, as the economy enters a recession, income and consumption falls, government gave a tax rebate to families, in total of \$500 billion.

Changes in $T = MPC / 1 - MPC$

$0.6 / (1 - 0.6)$

0.6 / 0.4

1.5 multiplier

500 billion * 1.5 = 750 billion; 250 billion increase