Unit 4
The Government and Fiscal Policy

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Learning Objectives

- Discuss the influence of fiscal policies on the economy.
- Describe the effects of three fiscal policy multipliers.
- Compare and contrast the budgets of the government administrations.
- Explain the influence of the economy on the government budget.

Contents

1. Government in the Economy
2. Fiscal Policy at Work: Multiplier Effects
3. The Economy's Influence on the Government Budget
4. Deriving the Fiscal Policy Multipliers

Preliminary

fiscal policy The government's spending and taxing policies.

monetary policy The behavior of the Central Bank concerning the nation's money supply.

Government in the Economy

discretionary fiscal policy Changes in taxes or spending that are the result of deliberate changes in government policy.

Government Purchases (G), Net Taxes (T), and Disposable Income (Y_d)

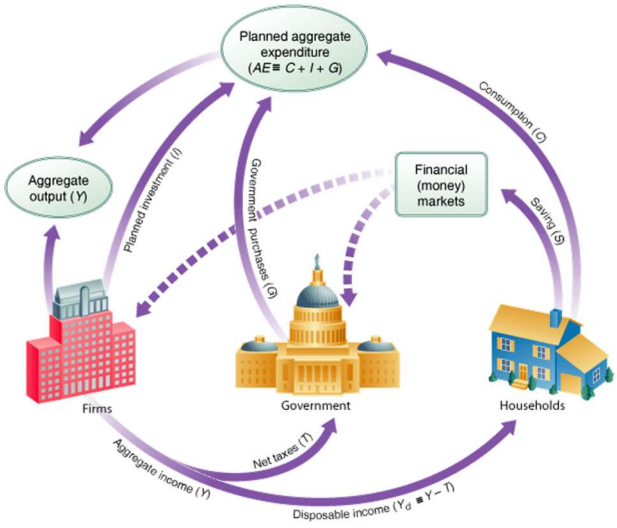
net taxes (T) Taxes paid by firms and households to the government minus transfer payments made to households by the government.

disposable, *or* after-tax, income (Y_d) Total income minus net taxes: $Y - T$.

disposable income ≡ total income − net taxes

$$Y_d \equiv Y - T$$

Adding Net Taxes (T) and Government Purchases (G) to the Circular Flow of Income



Aggregate Income and Aggregate Expenditure

The disposable income (Y_d) of households must end up as either consumption (C) or saving (S). Thus,

$$Y_d \equiv C + S$$

Because disposable income is aggregate income (Y) minus net taxes (T), we can write another identity:

$$Y - T \equiv C + S$$

By adding T to both sides:

$$Y \equiv C + S + T$$

Planned aggregate expenditure (AE) is the sum of consumption spending by households (C), planned investment by business firms (I), *and* government purchases of goods and services (G).

$$AE \equiv C + I + G$$

Government Budget

budget balance The difference between what a government collects in taxes and what it spends in a given period: $T - G$.

budget balance $\equiv T - G$

budget surplus if $T - G > 0$

budget deficit if $T - G < 0$

balanced budget if $T - G = 0$

New Consumption Function with Tax

To modify our aggregate consumption function to incorporate disposable income instead of before-tax income, instead of $C = a + bY$, we write

$$C = a + bY_d$$

or

$$C = C_0 + mpc(Y - T)$$

Our consumption function now has consumption depending on disposable income instead of before-tax income.

Planned Investment

The government can affect investment behavior through its tax treatment of depreciation and other tax policies.

Planned investment depends on the interest rate, both of which we continue to assume are fixed for purposes of this unit.

That is, $\mathbf{I = I_0}$

New AE Function

In the closed economy model:

$C = C_0 + mpc(Y - T)$

$I = I_0$ (exogenous)

$G = G_0$ (exogenous)

$T = T_0$ (exogenous)

So, $AE = C_0 + mpc(Y - T_0) + I_0 + G_0$

$$AE = (C_0 + I_0 + G_0 - mpc\,T_0) + mpc\,Y$$

The Determination of Equilibrium Output (Income)

$$Y = AE = C + I + G$$

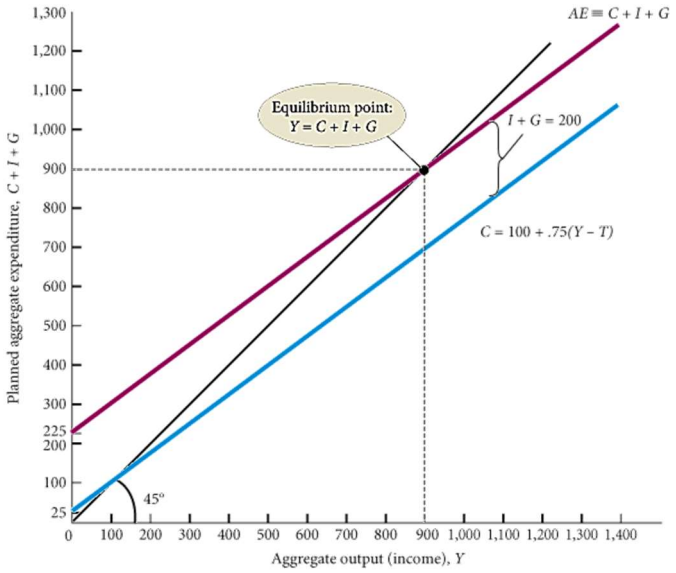
Finding Equilibrium for C = 100 + 0.75Yd, *I* = 100, *G* = 100, and *T* = 100

(1) Output (Income) *Y*	(2) Net Taxes *T*	(3) Disposable Income $Y_d \equiv Y - T$	(4) Consumption Spending $C = 100 + .75\ Y_d$	(5) Saving *S* $Y_d - C$	(6) Planned Investment Spending *I*	(7) Government Purchases *G*	(8) Planned Aggregate Expenditure $C + I + G$	(9) Unplanned Inventory Change $Y - (C + I + G)$	(10) Adjustment to Disequi-librium
300	100	200	250	− 50	100	100	450	− 150	Output ↑
500	100	400	400	0	100	100	600	− 100	Output ↑
700	100	600	550	50	100	100	750	− 50	Output ↑
900	100	800	700	100	100	100	900	0	Equilibrium
1,100	100	1,000	850	150	100	100	1,050	+ 50	Output ↓
1,300	100	1,200	1,000	200	100	100	1,200	+ 100	Output ↓
1,500	100	1,400	1,150	250	100	100	1,350	+ 150	Output ↓

Equilibrium Output/Income

Because *G* and *I* are both fixed at 100, the aggregate expenditure function is the new consumption function displaced upward by *I* + *G* = 200.

Equilibrium occurs at *Y* = *C* + *I* + *G* = 900.



The Saving/Investment Approach to Equilibrium

To derive this, we know that in equilibrium, aggregate output (income) (*Y*) equals planned aggregate expenditure (*AE*).

By definition, *AE* equals *C* + *I* + *G,* and by definition, *Y* equals *C* + *S* + *T.*

Therefore, at equilibrium:

$$C + S + T = C + I + G$$

Subtracting *C* from both sides leaves:

$$S + T = I + G$$

saving/investment approach to equilibrium:
S* + (*T* – *G*) = *I

Fiscal Policy at Work: Multiplier Effects

At this point, we are assuming that the government controls *G* and *T*. In this section, we will review three multipliers:

- Government spending multiplier
- Tax multiplier
- Balanced-budget multiplier

The Government Spending Multiplier

government spending multiplier The ratio of the change in the equilibrium level of output to a change in government spending.

$$\text{government spending multiplier} \equiv \frac{1}{MPS} \equiv \frac{1}{1 - MPC}$$

Change of Government Spending

Finding Equilibrium after a Government Spending Increase of 50 (*G* Has Increased from 100 to 150 Here)

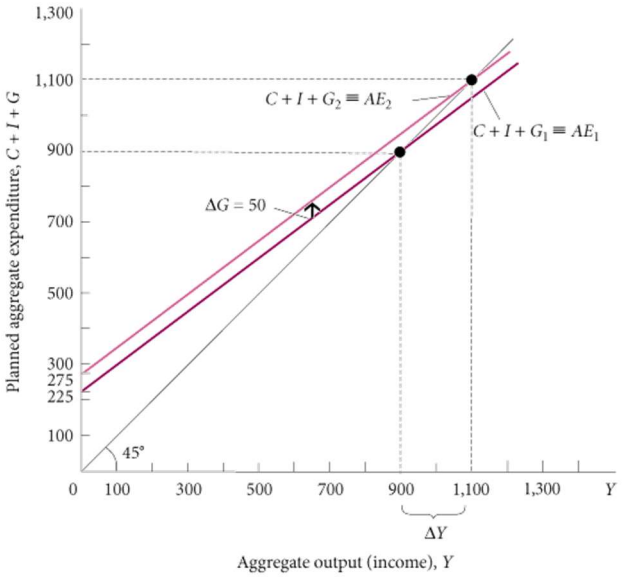
(1) Output (Income) *Y*	(2) Net Taxes *T*	(3) Disposable Income $Y_d \equiv Y - T$	(4) Consumption Spending $C = 100 + .75\ Y_d$	(5) Saving *S* $Y_d - C$	(6) Planned Investment Spending *I*	(7) Government Purchases *G*	(8) Planned Aggregate Expenditure $C + I + G$	(9) Unplanned Inventory Change $Y - (C + I + G)$	(10) Adjustment to Disequilibrium
300	100	200	250	– 50	100	150	500	– 200	Output ↑
500	100	400	400	0	100	150	650	– 150	Output ↑
700	100	600	550	50	100	150	800	– 100	Output ↑
900	100	800	700	100	100	150	950	– 50	Output ↑
1,100	100	1,000	850	150	100	150	1,100	0	Equilibrium
1,300	100	1,200	1,000	200	100	150	1,250	+ 50	Output ↓

The Government Spending Multiplier

Increasing government spending by 50 shifts the *AE* function up by 50.

As *Y* rises in response, additional consumption is generated.

Overall, the equilibrium level of *Y* increases by 200, from 900 to 1,100.



The Tax Multiplier

tax multiplier The ratio of change in the equilibrium level of output to a change in taxes.

$$\Delta Y = (\text{initial increase in aggregate expenditure}) \times \left(\frac{1}{MPS}\right)$$

Because the initial change in aggregate expenditure caused by a tax change of ΔT is $(-\Delta T \times MPC)$, we can solve for the tax multiplier by substitution:

$$\Delta Y = (-\Delta T \times MPC) \times \left(\frac{1}{MPS}\right) = -\Delta T \times \left(\frac{MPC}{MPS}\right)$$

Because a tax cut will cause an *increase* in consumption expenditures and output and a tax increase will cause a *reduction* in consumption expenditures and output, the tax multiplier is a negative multiplier:

$$\text{tax multiplier} \equiv -\left(\frac{MPC}{MPS}\right)$$

Finding Equilibrium after a tax decrease of 50 (*T* Has decreased from 100 to 60)

(1) Output (Income) *Y*	(2) Net Taxes *T*	(3) Disposable Income $Y_d \equiv Y - T$	(4) Consumption Spending $C = 100 + .75Y_d$	(5) Saving *S* $Y_d - C$	(6) Planned Investment Spending *I*	(7) Govern-ment Purchases *G*	(8) Planned Aggregate Expenditure $C + I + G$	(9) Unplanned Inventory Change $Y - (C + I + G)$	(10) Adjustment to Disequi-Librium
300	60	240	280	− 40	100	100	480	− 180	Output ↑
500	60	440	430	10	100	100	630	− 130	Output ↑
700	60	640	580	60	100	100	780	− 80	Output ↑
900	60	840	730	110	100	100	930	-30	Output ↑
1020	60	960	820	140	100	100	1020	0	Equilibrium
1,100	60	1.040	880	160	100	100	1080	+ 20	Output ↓
1,300	60	1,240	1030	210	100	100	1230	+ 70	Output ↓
1,500	60	1,440	1180	260	100	100	1380	+ 120	Output ↓

Can you find the equilibrium Y?

Balanced Budget Multiplier

- The ratio of change in the equilibrium level of output to a change in government spending where the change in government spending is balanced by a change in taxes so as not to create any deficit.
- **The balanced-budget multiplier is equal to one**: the change in Y resulting from the change in G and the equal change in T is exactly the same size as the initial change in G or T.

Three Multipliers

	Policy Stimulus	Multiplier	Final Impact on Equilibrium Y
Government spending multiplier	Increase or decrease in the level of government purchases: ΔG	$\frac{1}{MPS}$	$\Delta G \times \frac{1}{MPS}$
Tax multiplier	Increase or decrease in the level of net taxes: ΔT	$\frac{-MPC}{MPS}$	$\Delta T \times \frac{-MPC}{MPS}$
Balanced-budget multiplier	Simultaneous balanced-budget increase or decrease in the level of government purchases and net taxes: $\Delta G = \Delta T$	1	ΔG

Classification of Fiscal Policy

- **Expansionary Fiscal Policy:**
  - The government increases spending (G) or reduce net tax (T)
  - Equilibrium output: Rise
  - Potential problems:
    - government budget deficit
    - Public debt
- **Contractionary Fiscal Policy:**
  - The government reduces spending (G) or increase net tax (T)
  - Equilibrium output: Fall
  - Curbing high inflation

The Economy's Influence on the Government Budget

- Tax Revenues Depend on the State of the Economy
  - Tax revenue, on the other hand, depends on taxable income, and income depends on the state of the economy, which the government does not completely control.
- Some Government Expenditures Depend on the State of the Economy
  - Transfer payments tend to go down automatically during an expansion.
  - Inflation often picks up when the economy is expanding. This can lead the government to spend more than it had planned to spend.
  - Any change in the interest rate changes government interest payments.

VIETNAM's GOVERNMENT BUDGET BALANCE

Sources: công khai ngân sách Nhà nước (https://ckns.mof.gov.vn) — *Đơn vị: Tỷ đồng*

Stt	Chỉ tiêu	Items	Quyết toán 2019
No			*(Final Accounts 2019)*
A	**Thu NSNN và viện trợ**	**State budget revenues and grants**	**1,553,611**
1	Thu từ thuế và phí	Taxes and Fees	1,391,030
2	Thu về vốn	Capital revenues	157,448
3	Thu viện trợ không hoàn lại	Grants	5,133
B	**Thu chuyển nguồn từ năm trước**	**Brought forward revenues**	**434,357**
C	**Thu từ quỹ dự trữ tài chính**	**Revenues from the financial reserve fund**	**1,101**
D	**Thu kết dư năm trước**	**Balance of local budget in the previous year**	**150,570**
E	**Tổng chi ngân sách nhà nước**	**Total state expenditures**	**1,526,893**
	Trong đó:	Of which:	
1	Chi đầu tư phát triển	Investment and development expenditures	421,845
2	Chi thường xuyên	Current expenditures	1,105,048
F	**Chi kết chuyển năm sau**	**Brought forward expenditures**	**592,649**
G	**Bội chi ngân sách**	**Budget deficit**	**161,491**
	Bội chi so với GDP (%)	*Budget deficit/GDP (%)*	*2.67%*
1	Ngân sách trung ương	The Central Budget (Deficit)	161,491
2	Ngân sách địa phương	Local Budgets (Surplus)	0
H	**Chi trả nợ gốc**	**Principal repayment**	**188,214**

STATE BUDGET REVENUES

Đơn vị: Tỷ đồng

TT	Chỉ tiêu	Items	Quyết toán 2019
No			*(Final Accounts 2019)*
	Thu ngân sách nhà nước và viện trợ (I+II+III)	**State budget revenues and grants (I+II+III)**	**1,553,611**
I	**Thu thường xuyên**	**Current revenues**	**1,391,030**
I.1	**Thu thuế**	**Taxes**	**1,122,403**
1	Thuế thu nhập doanh nghiệp	Corporate income tax	270,610
2	Thuế thu nhập cá nhân	Personal income tax	109,406
3	Thuế sử dụng đất phi nông nghiệp	Land and housing tax	2,040
4	Lệ phí trước bạ	Registration tax	40,190
5	Thuế giá trị gia tăng	Value added tax	362,691
6	Thuế tiêu thụ đặc biệt	Excise tax	106,753
7	Thuế tài nguyên	Natural resouces tax	36,768
8	Thuế sử dụng đất nông nghiệp	Agricultural land-use tax	20
9	Thuế xuất khẩu, nhập khẩu, TTĐB và BVMT hàng nhập khẩu	Imp - Exp. tax, excise tax and environmental protection tax on Imports	96,943
10	Thuế bảo vệ môi trường	Environmental protection tax	63,075
11	Thu từ hoạt động xổ số kiến thiết	Revenue from Loterry	33,908
I.2	**Thu phí, lệ phí và thu ngoài thuế**	**Fees, charges and non-tax**	**268,627**
12	Thu phí, lệ phí	Fees and charges	41,011
13	Thu tiền thuê đất, thuê mặt nước	Land rents	33,829
14	Các khoản thu khác	Miscellaneous revenues	193,787
	Trong đó: thu hồi vốn NSNN đầu tư tại các tổ chức kinh tế	*Of which: SOE equitization proceeds*	53,587
II	**Thu về vốn (thu bán nhà ở, thu tiền sử dụng đất)**	**Capital revenues (revenues from sale of State - owned houses, land user right assignment)**	**157,448**
III	**Viện trợ không hoàn lại**	**Grants**	**5,133**

Sources: công khai ngân sách Nhà nước (https://ckns.mof.gov.vn)

FUNCTIONAL CLASSIFICATION OF EXPENDITURE

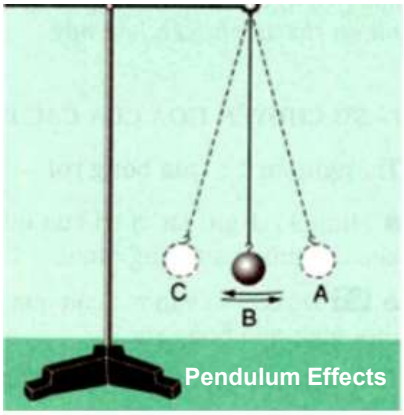
Đơn vị: Tỷ đồng

STT	Chỉ tiêu	Items	Quyết toán 2019
No			*(Final Accounts 2019)*
	Tổng chi NSNN	**Total state budget expenditures**	**1,526,893**
I	**Chi thường xuyên**	**Current expenditures**	**1,105,048**
1	Chi hoạt động thường xuyên	Current expenditures	997,983
	Trong đó:	*Of which*	
	- Chi giáo dục - đào tạo, dạy nghề	Education and training expenditures	237,767
	- Chi khoa học công nghệ	Science technology expenditures	12,426
2	Chi trả nợ lãi	Interest payment	107,065
II	**Chi đầu tư phát triển**	**Investment and development expenditures**	**421,845**

Sources: công khai ngân sách Nhà nước (https://ckns.mof.gov.vn)

The Economy's Influence on the Government Budget

- **automatic stabilizers**
  - automatic changes in government revenues and expenditures.
  - They help stabilize the economy.
    - In recessions, taxes fall and expenditures rise, which creates positive effects on the economy, and in expansions, the opposite happens.
    - The government does not have to change any laws for this to happen.



The Economy's Influence on the Government Budget

- **automatic destabilizer**
  - inflation can be considered to be an automatic destabilizer
    - Government spending increases as inflation increases, which further fuels the expansion, which is destabilizing.
    - If inflation decreases in a recession, there is an automatic decrease in government spending, which makes the recession worse.
- **fiscal drag**
  - The negative effect on the economy that occurs when average tax rates increase because taxpayers have moved into higher income brackets during an expansion.

The Economy's Influence on the Government Budget

- **full-employment budget** What the government budget would be if the economy were producing at the full-employment level of output.
- **structural deficit** The deficit that remains at full employment.
- **cyclical deficit** The deficit that occurs because of a downturn in the business cycle.

Deriving the Fiscal Policy Multipliers

The Government Spending and Tax Multipliers

We can derive the multiplier algebraically using our hypothetical consumption function:

$$C = a + b(Y - T)$$

The equilibrium condition is

$$Y = C + I + G$$

By substituting for *C*, we get

$$Y = a + b(Y - T) + I + G$$

$$Y = a + bY - bT + I + G$$

This equation can be rearranged to yield

$$Y - bY = a + I + G - bT$$

$$Y(1 - b) = a + I + G - bT$$

Now solve for *Y* by dividing through by (1 − *b*):

$$Y = \frac{1}{(1-b)}(a + I + G - bT)$$

Practice 1

For the data in the following table, the consumption function is C = 800 + 0.61Y - T2. Fill in the columns in the table and identify the equilibrium output.

Output	Net Taxes	Disposable Income	Consumption Spending	Saving	Planned Investment Spending	Government Purchases	Planned Aggregate Expenditure	Unplanned Inventory Change
2,100	100				300	400		
2,600	100				300	400		
3,100	100				300	400		
3,600	100				300	400		
4,100	100				300	400		
4,600	100				300	400		
5,100	100				300	400		

Practice 2

For each of the following sets of data, determine if output will need to increase, decrease, or remain the same to move the economy to equilibrium:

a. Y = 1,000; C = 150 + 0.5(Y – T); I = 100; G = 200; T = 180

b. Y = 1,250; C = 200 + 0.7(Y – T); I = 80; G = 250; T = 240

c. Y = 1,500; C = 400 + 0.8(Y – T); I = 250; G = 200; T = 150

d. Y = 1,500; C = 300 + 0.75(Y – T); I = 200; G = 200; T = 150

Practice 3

Assume the following for the economy of a country:

Consumption function: C = 50 + 0.85Yd

Investment: I = 80

Government spending: G = 50

Disposable income: Yd = Y - T

Net taxes: T = - 10 + 0.1Y

Equilibrium: Y = C + I + G

a. Solve for equilibrium income.

b. What happens to the economy when the marginal propensity to save increases to 0.2?