Lecture 3. The Goods (and Services) Market

Reading: Blanchard, Chapter 3.

In the previous lecture…

- Major macroeconomic variables
  1) GDP

  2) The unemployment rate

  3) The inflation rate

Outline

- The Composition of GDP
  - $Y = C + I + G + NX$
- The Consumption Function and the Keynesian Cross
- Investment – Saving Interpretation
- Government, Fiscal Policy, and Multipliers
- Automatic Stabilizers and Some Remarks on the Fiscal Policy

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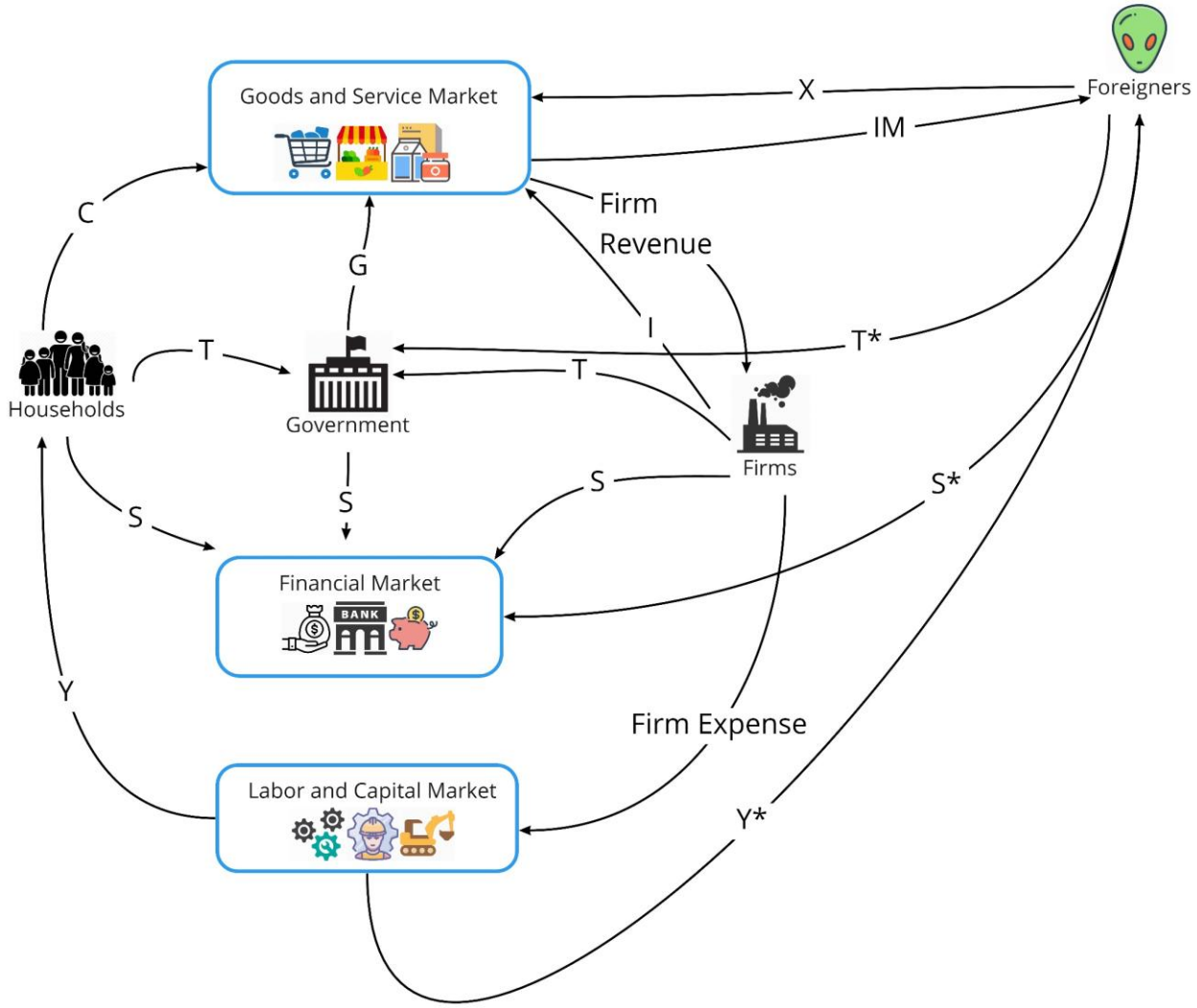
Circular flow of the economy



The demand / expenditure side of GDP

The final goods and services are purchased by consumers, firms, the government, and people in other countries.

-
-
-
-
    (1)
    (2)
-

Y = C + I + G + NX (+ Inventory Inv.)

- Consumption
- by (domestic) consumers
- Food, haircut, (new) cars, etc.

Y = C + I + G + NX (+ Inventory Inv.)

- (Fixed) Investment to distinguish from inventory investment
- Fixed Inv. = Inv.
  (by firms, new plants, machines, …)
  + Inv.
  (new houses or apartments)

- Remark) Investment in macroeconomics
  ≠ Financial investment (bond, stocks, forward, etc.)

Y = C + I + G + NX (+ Inventory Inv.)

- Government spending
- Military spending, office equipment, and
- Services provided by government employees
  - ex) police officer, fire fighter, teachers, etc.
  - Government employees produce services. The government purchases the services and pays salaries to the employee.

- Government transfers $\notin$ G

Y = C + I + G + NX (+ Inventory Inv.)

- Net exports = = -

- Trade : Exports > Imports ⇒ NX > 0
- Trade : Exports < Imports ⇒ NX < 0

Y = C + I + G + NX (+ Inventory Inv.)

- Inventory investment
- What is produced but not sold becomes inventory.
- What if a consumer buys a good produced in the last year?

The Composition of U.S. GDP, 2018

		Billions of Dollars	Percent of GDP
	GDP (*Y*)	20,500	100.0
1	Consumption (*C*)	13,951	68.0
2	Investment (*I*)	3,595	17.5
	Nonresidential	2,800	13.6
	Residential	795	3.8
3	Government spending (*G*)	3,522	17.2
4	Net exports	−625	−3.0
	Exports (*X*)	2,550	12.4
	Imports (*IM*)	−3,156	−15.4
5	Inventory investment	56	0.2

Source: Survey of Current Business, February 2019, Table 1-1-5

Implications

- Inventory investment is very very small.

  Therefore, from now on, we assume that $Y = C + I + G + NX$.
- NX is small in the U.S. (and in HK).

  We assume that $NX = 0$.
- G is chosen by the government. So, we take it as given.
- We will investigate I more carefully after we study interest rates.

- So, for now, we focus on , the largest component of Y.

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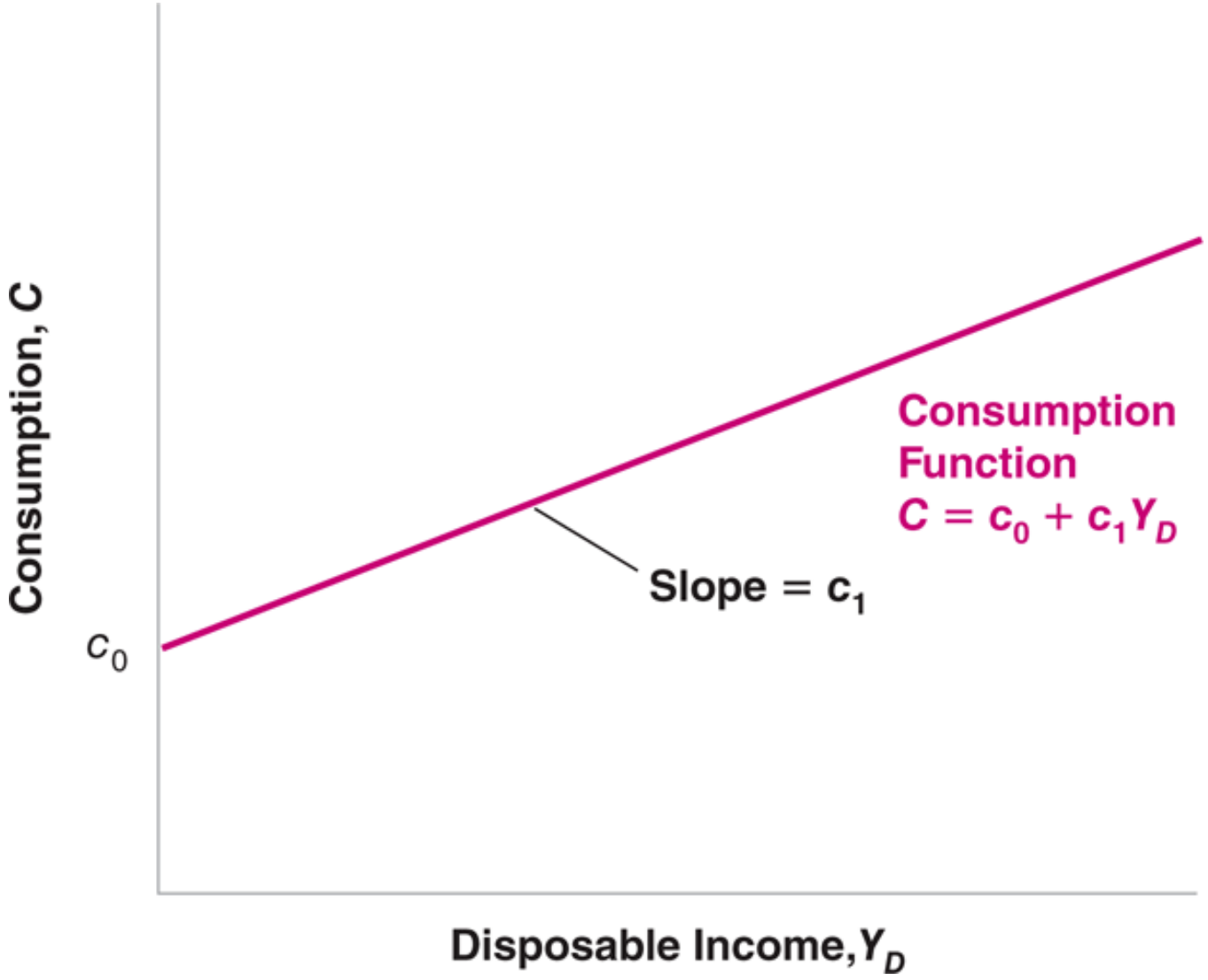
The consumption function

- Which factors affect how much a person consumes?
- C = a function of
- We ASSUME that



- When disposable income changes, we move along the curve.
- When something else changes, c_0 (c_1) varies and the curve shifts (rotates).

$$C = c_0 + c_1(Y - T)$$

- a behavioral equation

- c_0: autonomous consumption includes
  - subsistence level of consumption
  - effects of all the factors other than the disposable income (Y_D)

- c_1:
  - The effect an additional dollar of disposable income has on consumption.

What is the value of c_1?

TABLE 1. Empirical estimates of the marginal propensity to consume out of transitory income.

	Consumption Measure				
Authors	Nondurables	Durables	Total PCE	Horizon*	Event/Sample
Agarwal and Qian (2014)			0.90	10 months	Growth dividend program Singapore 2011
Blundell, Pistaferri, and Preston (2008)‡	0.05				Estimation sample: 1980–1992
Browning and Collado (2001)			∼0		Spanish ECPF data, 1985–1995
Coronado, Lupton and Sheiner (2005)			0.36	1 year	2003 tax cut
Hausman (2016)			0.6–0.75	1 year	1936 veterans' bonus
Hsieh (2003)‡	∼0		0.6–0.75		CEX, 1980–2001
Jappelli and Pistaferri (2014)	0.48				Italy, 2010
Johnson, Parker, and Souleles (2009)	∼0.25			3 months	2003 child tax credit
Lusardi (1996)‡	0.2–0.5				Estimation ample: 1980–1987
Parker (1999)	0.2			3 months	Estimation sample: 1980–1993
Parker, Souleles, Johnson, and McClelland (2013)	0.12–0.30		0.50–0.90	3 months	2008 economic stimulus
Sahm, Shapiro, and Slemrod (2010)			∼1/3	1 year	2008 economic stimulus
Shapiro and Slemrod (2009)			∼1/3	1 year	2008 economic stimulus
Souleles (1999)	0.045–0.09	0.29–0.54	0.34–0.64	3 months	Estimation sample: 1980–1991
Souleles (2002)	0.6–0.9			1 year	The Reagan tax cuts of the early 1980s

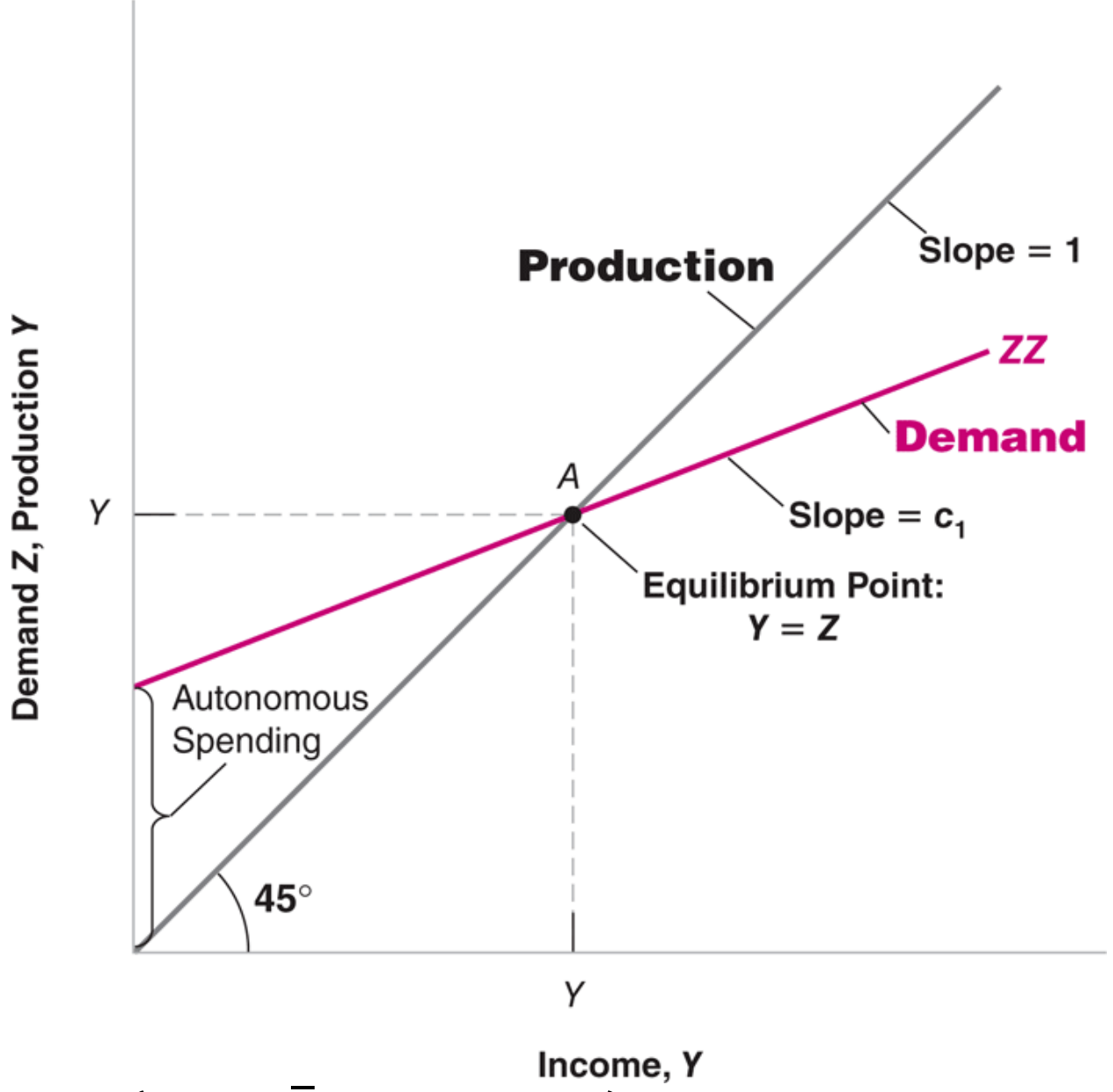
- Source: Carroll et al. (2017), "The distribution of wealth and the marginal propensity to consume," *Quantitative Economics* 8(3), 977-1020.

What is the value of c_1?

- There is no consensus among economists…
- Substantial amount of heterogeneity across consumers exists.
  - E. g., the poor usually have higher MPCs than the rich.
- Any value which is not extremely low or high would be okay for this course.

The Keynesian Cross

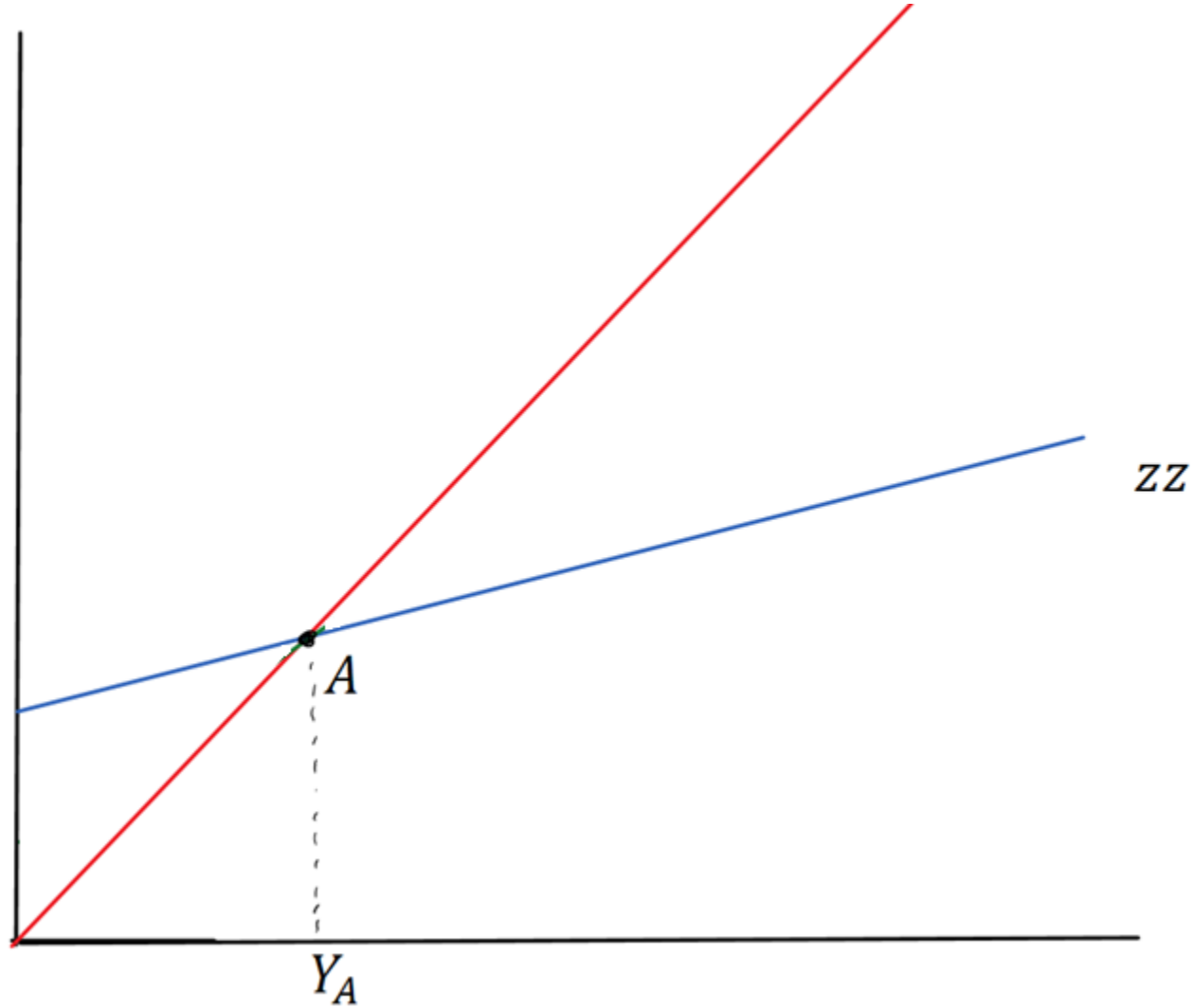
- Demand: Z
  - People want to purchase Z amount of goods and services given income Y.
- Supply: production Y
- Equilibrium condition for the goods and services market



- Demand : $Z = (c_0 + \bar{I} + G - c_1 T) + c_1 Y$
- Supply : Y (production) $= Y$ (income)

What happens if $c_0 \uparrow$?

- When does the autonomous consumption increase?


ZZ
A
Y_A

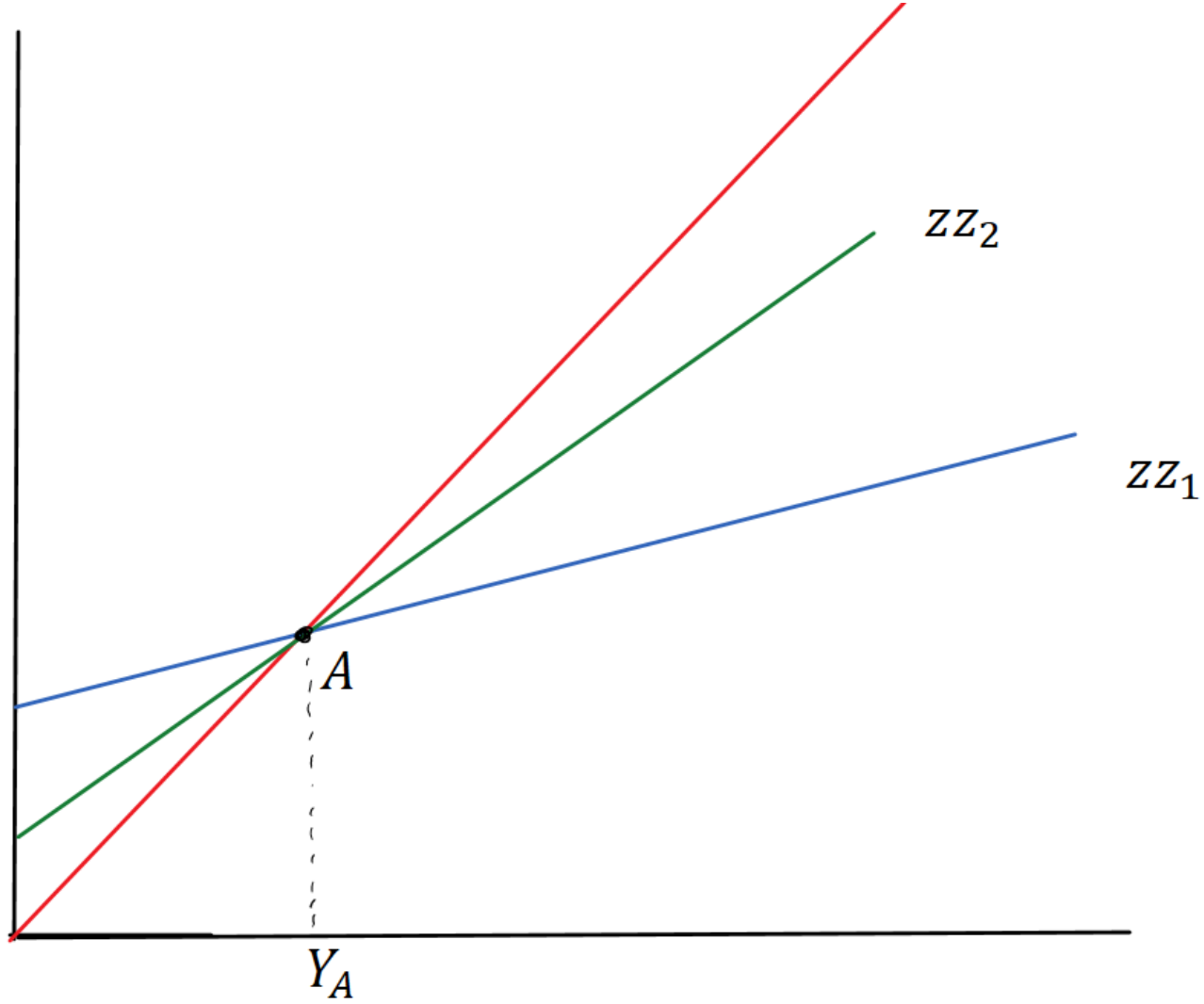
The total effect on equilibrium output

- $1 + c_1 + c_1^2 + c_1^3 + \cdots =$: “ ”

- For example, suppose that $c_1 = 0.5$. When c_0 increases by \$1, the equilibrium output Y increases by $\$2 = \frac{1}{1-0.5}$.

- The higher the MPC (c_1), the higher the multiplier.

Graphical illustration



Algebra

- Demand: $Z = (c_0 + \bar{I} + G - c_1 T) + c_1 Y$
- Equilibrium condition: $Y = Z$
- Derive the equilibrium output:

$$Y = \frac{1}{1 - c_1}(c_0 + \bar{I} + G - c_1 T)$$

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$Z = Y \quad \Leftrightarrow \quad I = Total\ saving$

- Private saving (S) : $S = Y_D - C = Y - T - C$
- Public saving : $T - G$

- Show that $Z = Y \quad \Leftrightarrow \quad I = Total\ saving.$
- $C + I + G = Y \quad \Leftrightarrow$

- IS relation: The amount that firms want to invest must equal the amount that people and the government want to save.

More on saving

- $S = Y_D - C = Y_D - (c_0 + c_1 Y_D) = -c_0 + (1 - c_1) Y_D$
  - Marginal Propensity to Save $(MPS) = 1 - c_1$

- The paradox of saving (or the paradox of thrift)
  - Suppose that consumers decide to save more
    by reducing c_0 or by reducing c_1
  - Will Y_D be the same? If not, how much will it change?
  - What is the ultimate effect on the private saving S?

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Taxes and Expenditures by governments

- **Taxes**: governments in advanced economies collect 35-50% of National Income in taxes.

- **Expenditures**:
  - **public goods** (infrastructure, public order and safety, defence),
  - **welfare state** (education, retirement benefits, health care, income support), and
  - **fiscal stimulus** to stabilize business cycles.

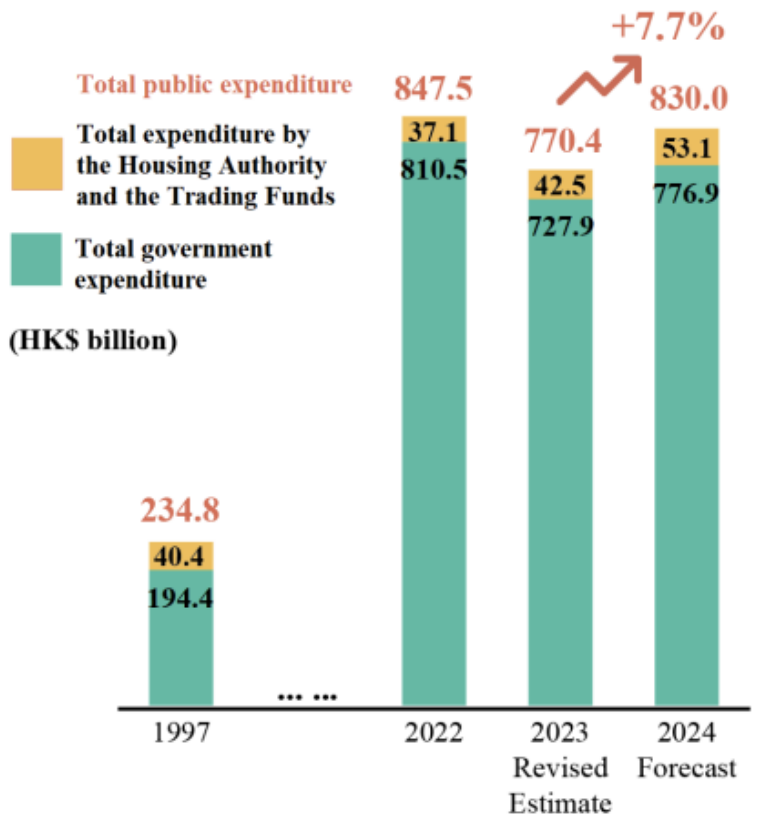
Two forms of expenditures

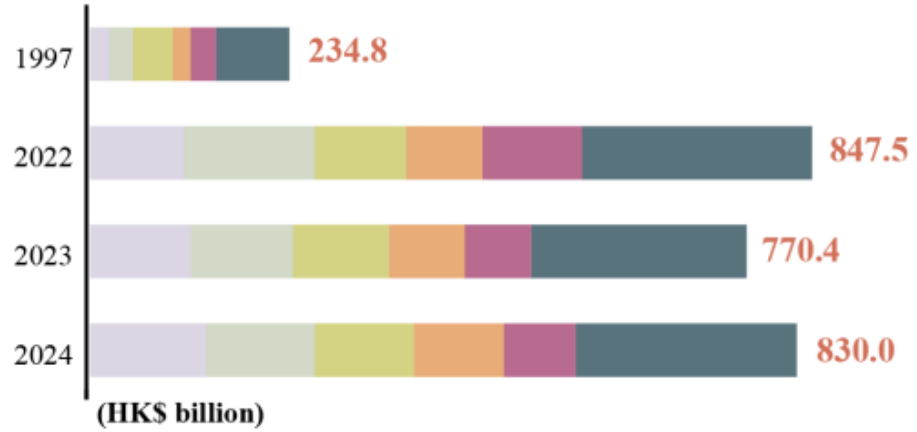
- **Entitlement (Mandatory) spending**: Mandatory funds for programs for which funding levels are automatically set by the number of eligible recipients (ex: Medicare, social security)
- **Discretionary spending**: Optional spending set by appropriation levels each year, at Congress's discretion (ex: defense)

- Q) To fight against recessions, which type of expenditure can be expanded?

Hong Kong Government

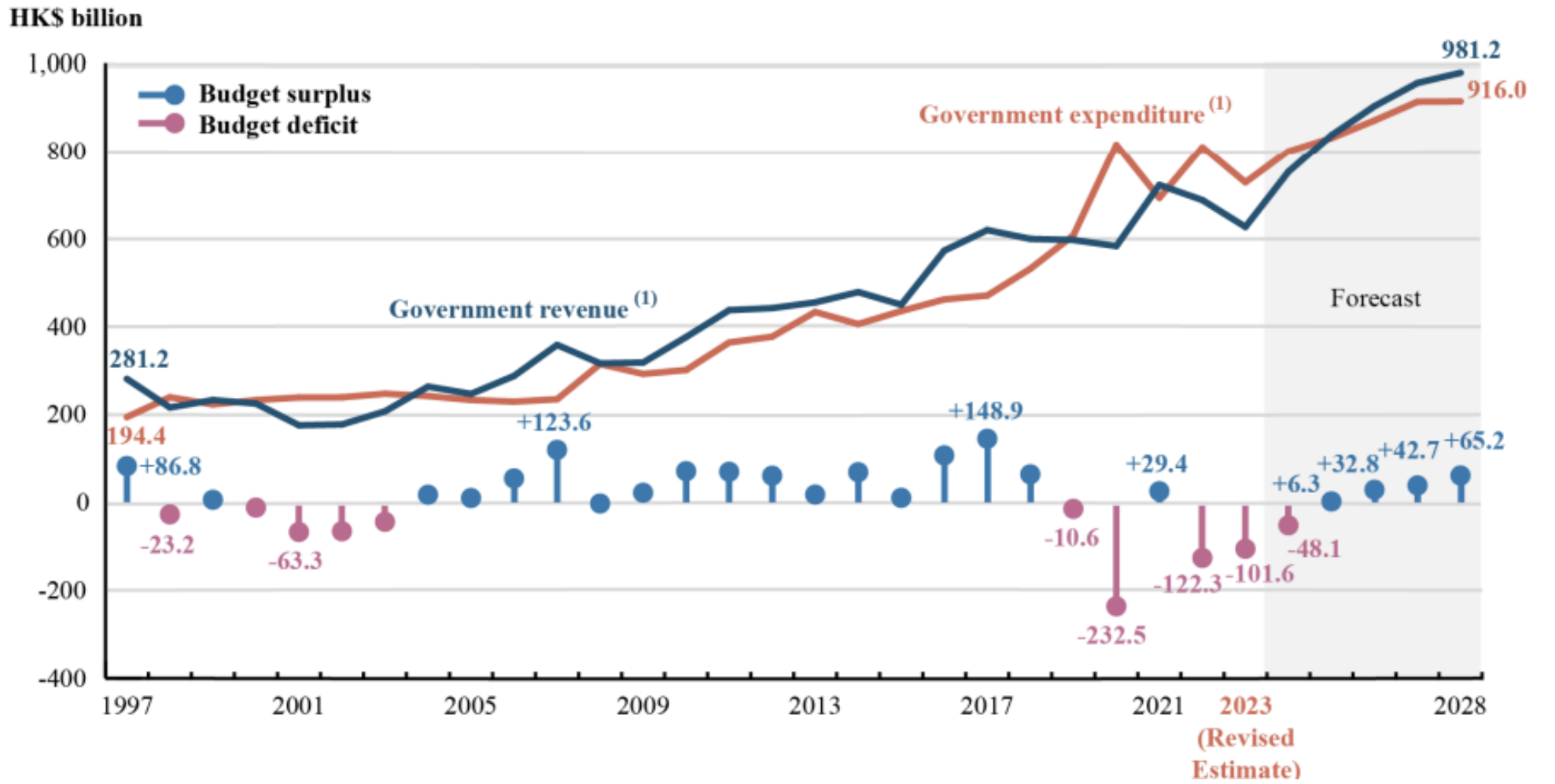
Figure 4 – Total public expenditure and its major components, 1997-1998 to 2024-2025(1)



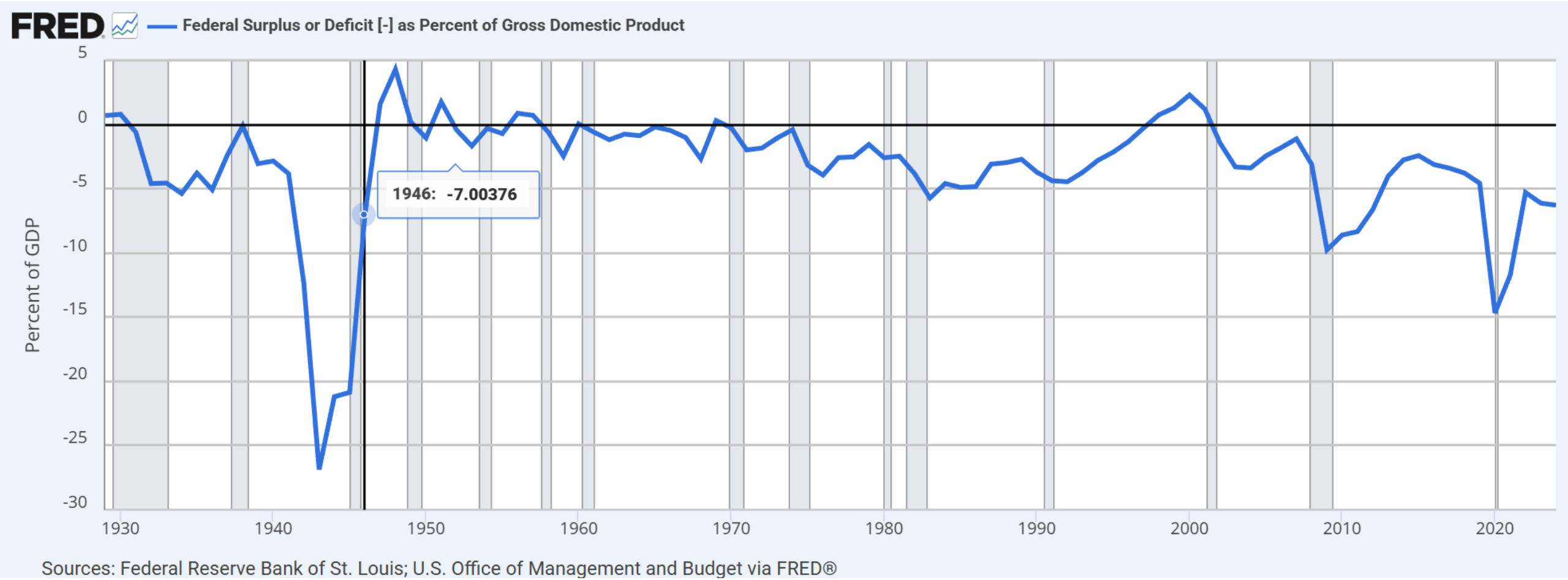


	1997	2022	2023	2024
Social welfare	9.1%	13.0%	15.3%	16.4%
Health	11.9%	18.1%	15.6%	15.4%
Education	20.3%	12.6%	14.7%	13.9%
Infrastructure	10.1%	10.6%	11.5%	12.8%
Support	11.8%	13.8%	10.1%	10.1%
Others (2)	36.8%	31.9%	32.8%	31.4%
Total amount (HK$ billion)	**234.8**	**847.5**	**770.4**	**830.0**

Hong Kong Government



US federal government



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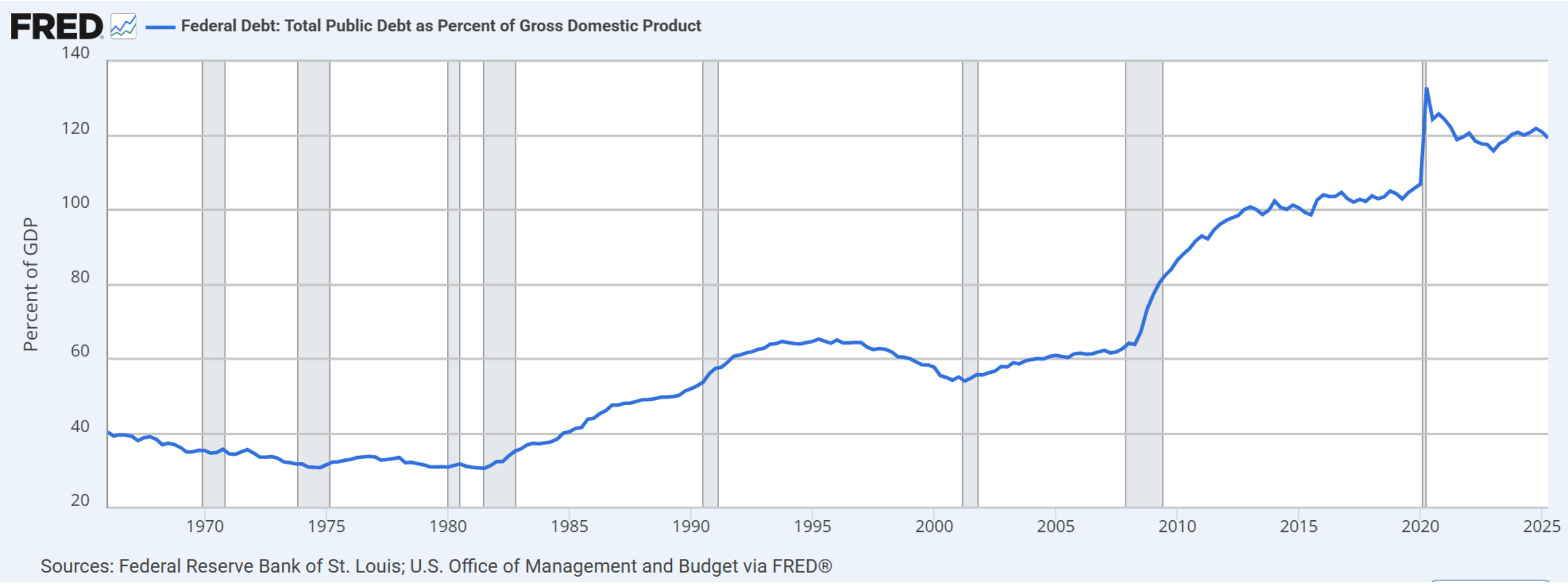
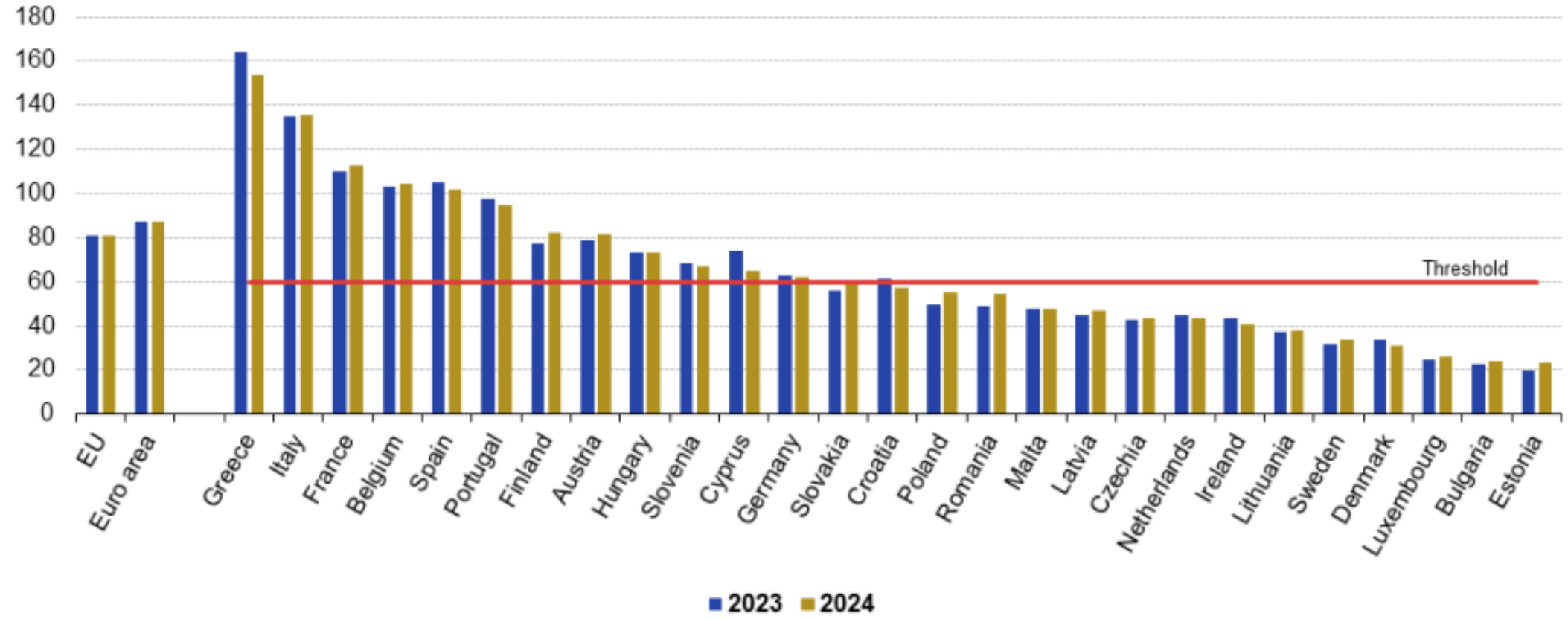


EU governments

General government debt, 2023 and 2024 (1)

(General government gross debt, % of GDP)



(1) Data extracted on 22/04/2025

Source: Eurostat (gov_10dd_edpt1)

eurostat

Sample Top 10 Tex Myths by Jessica Riedl

- *Tax cuts can bring some extra revenue.*

- They almost never pay for themselves.

- *Tax cuts will starve the beast by forcing Congress to cut spending.*

- Historically, its the opposite.

- *Europe funds its bigger governments by taxing the rich more.*

- It funds via value-added taxes, i.e., national sales taxes that hit the middle class.

- *Tax cuts for the rich are the reason we have large budget deficits.*

- Tax cut: 0.6% GDP, Spending: 6% GDP

- *Taxing corporations and millionaires can eliminate the deficit.*

- Even 100% tax rate or seizing all their wealth won't come close.

Fiscal stimulus: three different scenarios

1) $G: 1 \uparrow$

2) $T: 1 \downarrow$

3) $G: 1 \uparrow$ and $T: 1 \uparrow$

- Recall that the equilibrium output is given by

$$Y = \frac{1}{1 - c_1}(c_0 + \bar{I} + G - c_1 T).$$

- Compare 1) and 3): How to finance an increase in G matters!
  Deficit-financing vs. Tax-financing

1) Spending multiplier

- Remember that

$$Z = C + I + G = c_0 + c_1(Y - T) + \bar{I} + G$$

- What will happen to Y if we increase G while not changing T?

- Multiplier $\left(\frac{\Delta Y}{\Delta G}\right)$?

2) Tax multiplier

- Remember that

$$Z = C + I + G = c_0 + c_1(Y - T) + \bar{I} + G$$

- What will happen to Y if we decrease T while not changing G?

- Multiplier $\left(\frac{\Delta Y}{\Delta T}\right)$?

3) Balanced budget multiplier

- Remember that

$$Z = C + I + G = c_0 + c_1(Y - T) + \bar{I} + G$$

- What will happen to Y if we increase G and T by one unit?

- Multiplier $\left(\frac{\Delta Y}{\Delta G}\middle|_{\Delta G=\Delta T}\right)$?

Spending multipliers in the real-world

- Data:
- "In that paper, which focused only on temporary, **deficit-financed** increases in government purchases, I concluded based on the evidence available from US data at that time that the multiplier was probably between **0.8 to 1.5**, but that the data did not reject a range from 0.5 to 2."
- Ramey, Valerie A. (2019), "Ten Years After the Financial Crisis: What Have We Learned from the Renaissance in Fiscal Research?," *Journal of Economic Perspectives* 33(2), 89-114.

- Our model: $\frac{1}{1-c_1} \geq 1$. For example, if $c_1 = 0.5$, $\frac{1}{1-c_1} = 2$.

What are missing in our current model?

- As more variables are incorporated into the model, you will see how the fiscal multiplier changes.

- Chapters 4 and 5:
- Chapter 5:

- Chapters 7, 8, and 9:

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Automatic stabilizers

- We studied the effects of ‘discretionary’ fiscal policies.
- However, the built-in responses of the tax-and-transfer system can be useful for stabilizing economic fluctuations (i.e., business cycles).

- These policies governed by (automatic) rules are called “automatic stabilizers.”

EX1) Unemployment insurance (UI)

- In recessions, $Y \downarrow$, more people become unemployed (Lecture 2).
- The government pays parts of workers' original earnings for a specified amount of time.
- This would help the unemployed workers and reduce the negative effects of recession on consumption.

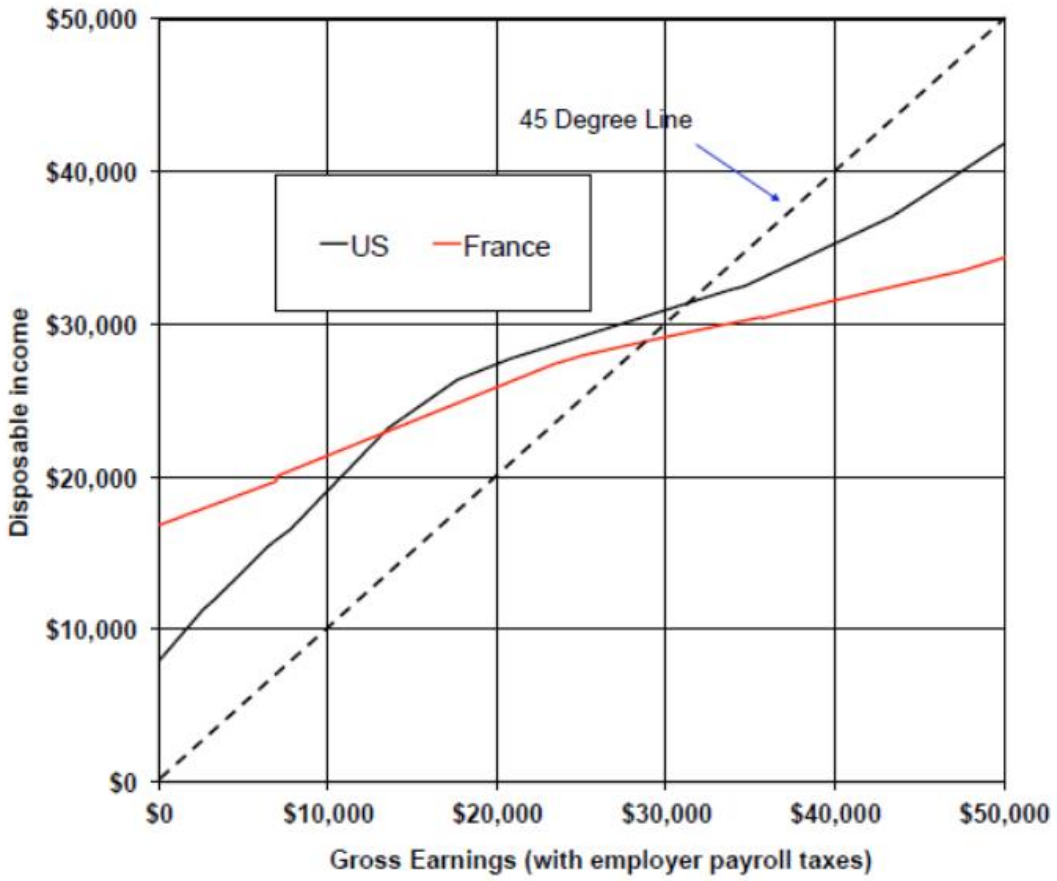
EX2) Progressive income tax system

- Most countries have progressive income tax system. That is, as you earn more, the tax rate gets higher.

- During expansions, $Y \uparrow$, income increases, and people pay more taxes.

- This makes the reaction of C less sensitive to the change in Y, i.e., automatically stabilizes the economy.

- Exercise #5, p. 83.

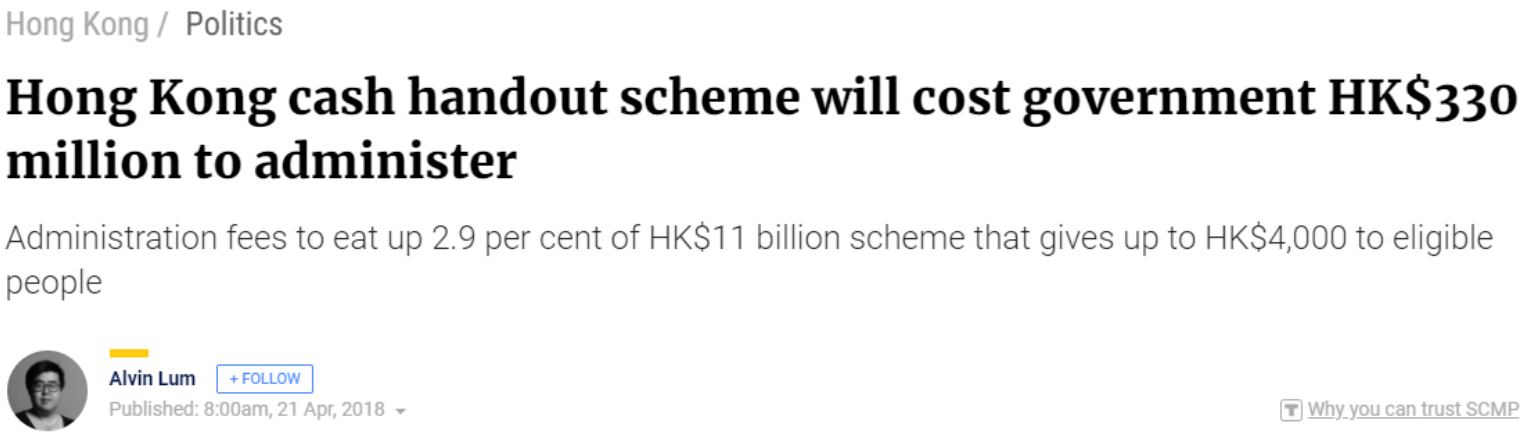


Source: Piketty, Thomas, and Emmanuel Saez (2012)

- US and France in 2010.
- The poor receive positive transfers.
- The rich pay more tax.

Some remarks on the fiscal policy

- Fiscal policy (FP) takes time and can be expensive.



Hong Kong / Politics

Hong Kong cash handout scheme will cost government HK$330 million to administer

Administration fees to eat up 2.9 per cent of HK$11 billion scheme that gives up to HK$4,000 to eligible people

Alvin Lum + FOLLOW

Published: 8:00am, 21 Apr, 2018

Why you can trust SCMP

- Monetary policy (MP) has shorter “ ” than FP.
- But when interest rates are close to zero and there are not many remaining policy options for the central bank, FP can be very important.

In the next class…

- We will look at the financial markets and the determination of the interest rate. We focus on how monetary policy can (and cannot) affect the interest rate.

- Blanchard, Chapter 4.