Aggregate expenditures, pt. II

EC 103–02

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Motivation

Housekeeping

Required readings:

- Case, Fair, & Oster (2012), ch. 8.
    - See *Extra Readings* module on `theSpring`.

Aggregate expenditures

Last time, we started a more **formal** approach to Macroeconomics.

Our starting point was **aggregate expenditures**:

$$GDP = \mathbf{C + I} + G + (X - M)$$

We are currently assuming that aggregate consumption (C) depends only on the level of income (via the *marginal propensity to consume*), and that aggregate investment is equal to what firms have *planned*.

Now, it is time to study situations of **equilibrium** in macroeconomic context.

Equilibrium output

Equilibrium output

In Economics, the notion of an **equilibrium** comes up whenever there is **no** tendency for **change**.

Let us take the market for *goods and services*, for instance.

- Thus involving **aggregate household consumption**.

Whenever *total production* of a good (e.g., cars) is matched by *planned expenditures* on these goods, we are in **equilibrium**.

- This way, both producers and consumers are satisfied.

Then, we can define these **planned aggregate expenditures** (AE) as:

$$AE \equiv C + I$$

> **Planned aggregate expenditures** (AE) are the total value amount the economy plans to spend in a given period. It includes aggregate **consumption**, as well as **planned investment** expenditures.

Equilibrium output

In a closed economy with no foreign sector, an economy will be in **equilibrium** whenever aggregate output (Y) equals planned aggregate expenditures.

$$Y = AE$$

And since $AE \equiv C + I$,

$$Y = C + I$$

At this point, it is important to remark that an economy will **hardly ever be** at this equilibrium state.

However, we benefit from this "*center of gravity*" for our practical purposes.

Equilibrium output

What happens when

$$Y > C + I \ ?$$

Or when

$$C + I > Y \ ?$$

In the first situation, firms planned to sell **more** than they actually did.

- This will be reflected in an **unplanned** change in inventories.

In the second, firms ended up selling more than what was planned.

- Thus aggregate spending exceeds current output.

Equilibrium output

Let us look at this issue through an **example**.

Suppose the following aggregate consumption and planned investment functions, respectively:

$$C = 150 + 0.8Y$$

$$I = 40$$

1. Is the economy in *equilibrium* when aggregate output (Y) equals $ 250?
2. Is the economy in *equilibrium* when aggregate output (Y) equals $ 1,000?
3. What is the output *equilibrium condition* for this economy?
4. Graphically represent this economy, with aggregate *expenditures* on the vertical, and aggregate *output* on the horizontal axis.

The *Saving = Investment* condition

The *Saving = Investment* condition

Recall that the *fraction* of aggregate income that is not spent on consumption is **saved**.

$$Y \equiv C + S$$

Taking the above equation with the **equilibrium condition**

$$Y = C + I$$

We have

$$C + S = C + I$$

Subtracting **C**onsumption from both sides:

$$S = I$$

The *Saving = Investment* condition

What does the $S = I$ condition tell?

- It tells that only when **planned investment equals aggregate saving** will the economy be in **equilibrium**.

From our previous example, what is the *equilibrium* amount of saving?

The multiplier

The multiplier

So far, the total output of our economy equals its aggregate expenditures in equilibrium.

$$Y = C + I$$

From this, we can ask:

- What happens to output if **planned investment** changes from, say, $I_1 = \$40$ to $I_2 = \$80$?

Now, aggregate planned expenditures exceed total output ($C + I > Y$), and firms will have their inventories reduced.

- For instance, less unsold cars, computers, equipment, ...

The multiplier

To respond to these decreased inventories, firms will have to **increase output** and restore planned inventories.

This increased production helps to increase employment, and more people are earning income than before.

- A large portion of this income will be spent on **consumption**!

Therefore, increasing aggregate investment also **helps** to increase aggregate consumption.

As these events unfold, the economy will **not** return to its previous **equilibrium**, as the levels of consumption, investment, and output have changed.

The multiplier

Recall that, as income rises, consumption also rises, but not in the same *proportion*.

With this new push in investment and the following increase in aggregate consumption, **aggregate saving** (*S*) also tends to rise.

From a few slides ago, we saw that $S = I$ is a **necessary condition** for equilibrium in an economy.

- This means that any *new* investment must be **compensated** with an equal increase in aggregate *saving*.

Therefore, *S* also has to rise to $80, so the economy is back in equilibrium.

Since **added saving** is a fraction of **added income** (the *MPS*), the increase in income required to restore equilibrium must be ***a multiple of the increase in planned investment***.

The multiplier

Repeating:

- Since **added saving** is a fraction of **added income** (the *MPS*), the increase in income required to restore equilibrium must be ***a multiple of the increase in planned investment***.

The marginal propensity to save is, by definition:

$$\text{MPS} = \frac{\Delta S}{\Delta Y}$$

To restore equilibrium, $S = I$, so $\Delta S = \Delta I$. Then,

$$\text{MPS} = \frac{\Delta I}{\Delta Y}$$

The multiplier

Again:

$$\text{MPS} = \frac{\Delta I}{\Delta Y}$$

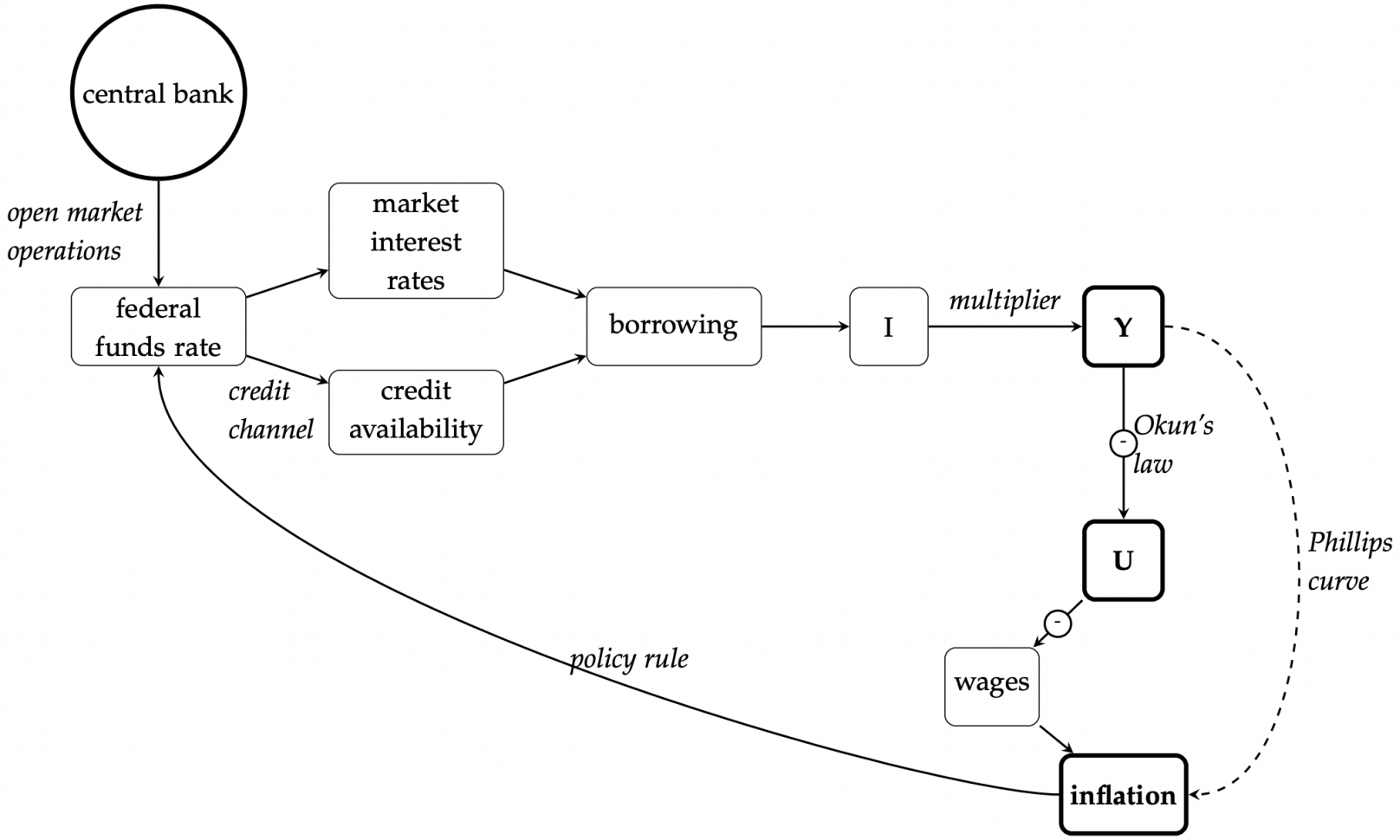
$$\Delta Y = \Delta I \times \frac{1}{\text{MPS}}$$

Thus, the change in equilibrium income (ΔY) is equal to the initial change in planned investment (ΔI) times $1/MPS$.

The **multiplier** is, then, given by

$$\frac{1}{\text{MPS}} \quad \text{or} \quad \frac{1}{1 - \text{MPC}}$$

From a few weeks ago...



Next time: Government expenditures & fiscal policy