Money and Public Purpose

Week 2: Basics of Macroeconomics

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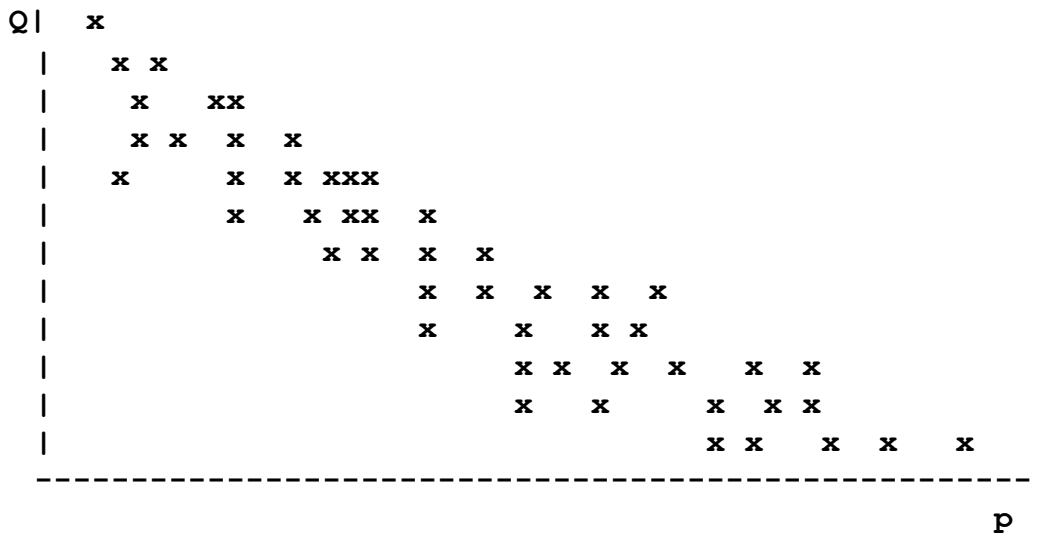
Concepts You Will Need to Participate in Economic Discussions

Based in part on Chap 2 of *Macroeconomics* by Mitchell, Wray and Watt

Correlation versus Causation

Correlation: Observe empirical relationship between variations in phenomena

T-shirts



Example of Inverse Correlation

Increasing sales (Q) associated with decreasing price (p)

Decreasing sales associated with increasing price

Example of Inverse Correlation

- Increasing sales (Q) associated with decreasing price (p)
- Decreasing sales associated with increasing price
- As yet unexplained

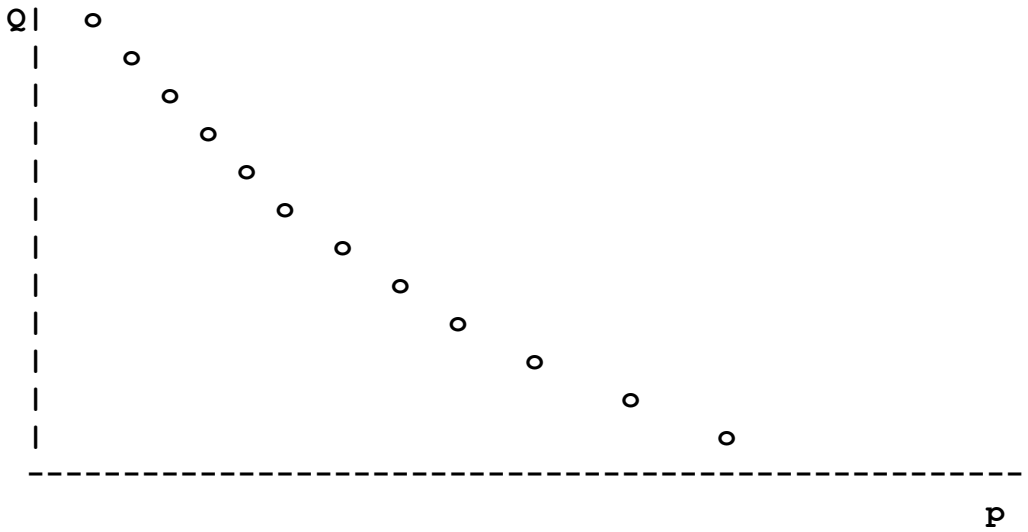
Develop a Hypothesis

Human language: “People will buy more of a product if the price is cut”

Algebra:

$$Q = f(p)$$

Graph the Hypothesis



Hypothesis Asserts Causation

- But does not prove it

Independent and Dependent Variables

$$Q = f(p)$$

- **p** is independent variable
- **Q** is dependent variable
- Hypothesize that changes in **Q** depend upon changes in **p**
  - Not the other way around

T-shirts Depend on Fashion as well as Price

$$Q = f(p,F)$$

- More than one independent variable

T-shirt Manufacturers Take Past Results into Account

$$Q_t = f(p, F, Q_{t-1})$$

- Function now has time coefficients
- **Q** is both independent and dependent variable
  - Depending on time period observed

Exogenous and Endogenous Variables

- **Exogenous**: Value said to be set outside normal, day-to-day workings of markets
- **Endogenous**: Value said to be set by the workings of markets
- Note qualification *“is said to be set”*
    - “Exogenous” and “endogenous” only pertain to given theory

Is the money supply exogenous or endogenous?

Monetarism

- Popularized by Milton Friedman
- Dominant in 1970s and 1980s
- Changes in overall output are primarily a function of changes in money supply
- Changes in money supply are a multiple of changes in the monetary base, which mainly consist of bank reserves
- Changes in bank reserves are under the control of the Federal Reserve

Monetarism Asserts Money Supply Is Exogenously Determined

Institutional decisions by Federal Reserve -- not market outcomes

Modern Monetary Theory

- Changes in overall output are primarily a function of changes in business expectations — not changes in the money supply
- To contrary, changes in money supply are primarily a function of volume of bank lending.
- Volume of bank lending, in turn, reflects state of business expectations and banks' estimates of likely profitability of loans
    - Loans create deposits

MMT: Money Supply Is Endogenously Determined

Changes in money supply are consequence of normal workings of market system

Post Hoc Ergo Propter Hoc

A logical fallacy

Asserts that because Event B occurred **after** Event A,
Event B was in some sense **caused** by Event A

Post Hoc Ergo Propter Hoc: A Very Crude Example (1)

> *"The September 11 attacks followed the Supreme Court decision handing victory in the 2000 presidential election to George Bush."*

- The term "*followed*" in the statement above has a connotation of *"was caused by"*
- Only a conspiracy theorist would take this connotation seriously

Post Hoc Ergo Propter Hoc: A Very Crude Example (2)

> *"The September 11 attacks followed the decision by the U.S. to base troops in Saudi Arabia after the conclusion of the 1991 Gulf War."*

- A more plausible statement
- Osama bin Laden publicly denounced the U.S. bases as sacrilegeous long before 9/11

Fallacy of Composition

- A logical fallacy
- Arises when we infer that something which is true at the *individual* level is also true at the *aggregate* level.

Fallacy of Composition: Crowded Stadium (1)

- One person stands up a stadium. What happens?

Fallacy of Composition: Crowded Stadium (2)

- Everyone stands up at once. What happens now?

Fallacy of Composition: Paradox of Thrift

- Popularized by John Maynard Keynes
- If an individual decides to cut back his or her spending in order to save money, he or she accumulates savings.
- However, if everyone reduces their spending at once, aggregate income decreases because all income comes from someone else's spending.

Fallacy of Composition: Other Examples?

- Can anyone cite another example of the fallacy of composition which we've already discussed in this course?

Macroeconomics

Study of the scope of a nation's entire economy

Define / Measure / Explain / Predict

- **Output**: the value of what is produced in a country
- **Income**: the value received by people for producing that output
- **Employment**: the level of employment (and unemployment) associated with that production
- **Prices**: changes in prices of the output
- **Interest and profit rates**
- **Distribution of income and wealth**

Prediction: not in this course

Explanation: later

Definition and Measurement

- "Define" and "measure are not entirely separate from one another.
- Logically, we can only measure what we first define.
- But what we choose to define depends to a great degree on what we can measure.

Gross Domestic Product (GDP) (1)

> "GDP is the measure of all final goods and services evaluated at market prices which are produced per period of time, say a quarter or a year." (Macro, 50)

GDP is a **flow variable** -- measured over time

In contrast, a **stock variable** is measured at a single point in time.

Gross Domestic Product (GDP) (2)

Measure of **final goods and services**

- What gets sold to final users, whether those final users be individuals, firms or government.

Measure of final goods and services **at market prices**

Criticisms of Gross Domestic Product as a Concept (1)

Many criticisms over 90 years

- Doesn’t measure productive activity which does not take form of purchase or sale
  - Especially, it does not account for unpaid labor within the home -- work typically performed by women
- Doesn’t measure productive activity which does involve a monetary transaction but which is outside the scope of a legal economy
  - If you hire a nanny to look after your children but pay her off the books, that's not going to be captured in GDP.

Criticisms of Gross Domestic Product as a Concept (2)

- Measures productive activity that entails monetary transactions but does not contribute to our collective well-being
  - Includes the value of oil production in the Gulf of Mexico
  - Includes the value of spending on cleaning up oil spills in the Gulf of Mexico
  - Does not include the damage to our health caused by the consumption of that oil

Other Macroeconomic Measures

Gross National Happiness

- Outside scope of this course

GDP focuses on monetary value of output

- Focuses on production for sale in exchange for money
- That’s the point of capitalist production

Components of Gross Domestic Product (1)

4 major categories:

- **Consumption**: domestic consumption of final goods and services by households
- **Investment**: spending that increases the productive capacity of the economy, with three major subcategories:
  - Capital investment by firms
  - Inventory investment by firms
  - Real estate investment by households

Components of Gross Domestic Product (2)

- **Government**: government purchases of final goods and services
- **Net Exports**: Exports minus imports
  - May be either positive (more exports than imports) or negative (more imports than exports)

GDP as an Accounting Identity

$$GDP \equiv C + I + G + (X - M)$$

- **C**: Consumption
- **I**: Investment
- **G**: Government
- **X**: Exports
- **M**: Imports

Mathematical Identity

"an algebraic equation which always holds true because of the way the variables in the equation are defined." (Macro, 55)

One person's spending is another person's income

In a monetary transaction, true by definition

Aggregate Spending Equals Aggregate Income

At aggregate level, total spending on productive activity equals total income received from that activity

- **Y**: aggregate income

$$Y \equiv GDP \equiv C + I + G + (X - M) \quad (1)$$

Spending From Aggregate Income

What can the individuals who receive various components of national income do with that income?

Another answer which is definitional in nature:

2 $$Y \equiv GDP \equiv C + T + S$$

- **C**: Consumption
- **T**: Taxes
- **S**: Savings (residual; does **not** imply *"saving for the future"*)

Combine two last identities into one:

3 $$Y \equiv C + T + S \equiv GDP \equiv C + I + G + (X - M)$$

Simplify:

4 $$C + T + S \equiv C + I + G + (X - M)$$

Eliminate **C** from each side of equation:

5 $$T + S \equiv I + G + (X - M)$$

$$T + S \equiv I + G + (X - M) \quad (5)$$

Subtract **T** from each side of equation:

$$S \equiv I + G + (X - M) - T \quad (6)$$

Subtract **I** from each side of the equation:

$$(S - I) \equiv G + (X - M) - T \quad (7)$$

$$(S - I) \equiv G + (X - M) - T \quad (7)$$

Regroup terms on right-hand side of equation:

$$(S - I) \equiv (G - T) + (X - M) \quad (8)$$

Now, move all terms to left-hand side of equation:

$$(S - I) - (G - T) - (X - M) \equiv 0 \quad (9)$$

$$(S - I) - (G - T) - (X - M) \equiv 0 \quad (9)$$

Now, resolve minus signs on left-hand side of equation:

$$(S - I) + (T - G) + (M - X) \equiv 0 \quad (10)$$

The Sectoral Balances Equation

10 $$(S - I) + (T - G) + (M - X) \equiv 0$$

Domestic Private Sector	Government Sector	Foreign Sector

- Sector balances sum to zero
- M - X: Foreign sector balance
- X - M: Current account balance (CAB)

Government Sector

10 $$(S - I) + (T - G) + (M - X) \equiv 0$$

- If (T - G) > 0 : Government is collecting more in taxes than it's spending
  - (G - T) < 0
  - Government sector runs a surplus
- If (T - G) < 0 : Government is spending more than it's collecting in taxes
  - (G - T) > 0
  - Government sector runs a deficit

(Macro, 56)

Sectoral Balances Must Sum to Zero

We can now say:

> "The private domestic financial balance plus the government financial balance plus the current account deficit equals zero." (Macro, 85)

Accounting identity: true by definition

See also: Wikipedia article on Sectoral Balances

Enough Algebra!

Example 1:

- Suppose the external financial balance is: **$ 0B**
- Assume private domestic sector's income is: **100B**
- Assume private domestic sector's spending is: **90B**
- Private domestic sector’s surplus for year is: **10B**

$$(10) + (T - G) + (0) \equiv 0$$

What must **(T - G)** be?

Example 1 (cont'd):

$$(10) + (T - G) + (0) \equiv 0$$

What must (T - G) be?

$$(10) + (-10) + (0) \equiv 0$$

- Government's sector fiscal deficit for year must be **$10B**
- Private domestic sector will accumulate **$10B** of net financial wealth during year, consisting of **$10B** of domestic government sector liabilities
- (Given that external balance is **0**) (Macro, 85)

Example 2:

- Suppose imports exceed exports by **$20B**
  - Foreign sector has surplus of $20B
  - From country's point of view, current account deficit of $20B
- Suppose government sector spends less than it collects in taxes, running a fiscal surplus of **$10B**

$$(S - I) + (10) + (20) \equiv 0$$

What must the private domestic sector's balance be?

Example 2 (cont'd):

$$(S - I) + (10) + (20) \equiv 0$$

What must **(S - I)** be?

$$(-30) + (10) + (20) \equiv 0$$

- Private domestic sector must have run a deficit of **$30B**
- The private sector's net financial wealth has fallen by **$30B**
- Government sector's net financial wealth must have increased by **$10B**
- External sector's net financial wealth must have increased by **$20B**

Sectors must balance

"[F]or one sector to run a surplus, at least one other sector must run a deficit. In terms of stock variables, in order for one sector to accumulate net financial wealth, at least one other sector must be in deficit. It is impossible for all sectors to accumulate net financial wealth by running surpluses." (Macro, 86)

Sectoral Balances in a Two-Sector Economy

- Think back to exercise we did in first class
- In two-sector economy, government deficit = private sector surplus

A Historical Look at the US Sectoral Balances

- Handout shows sectoral balances from 1952-2012
- Three sectors:
  - **Green** = Foreign Sector
  - **Blue** = Private Sector
  - **Red** = Government Sector

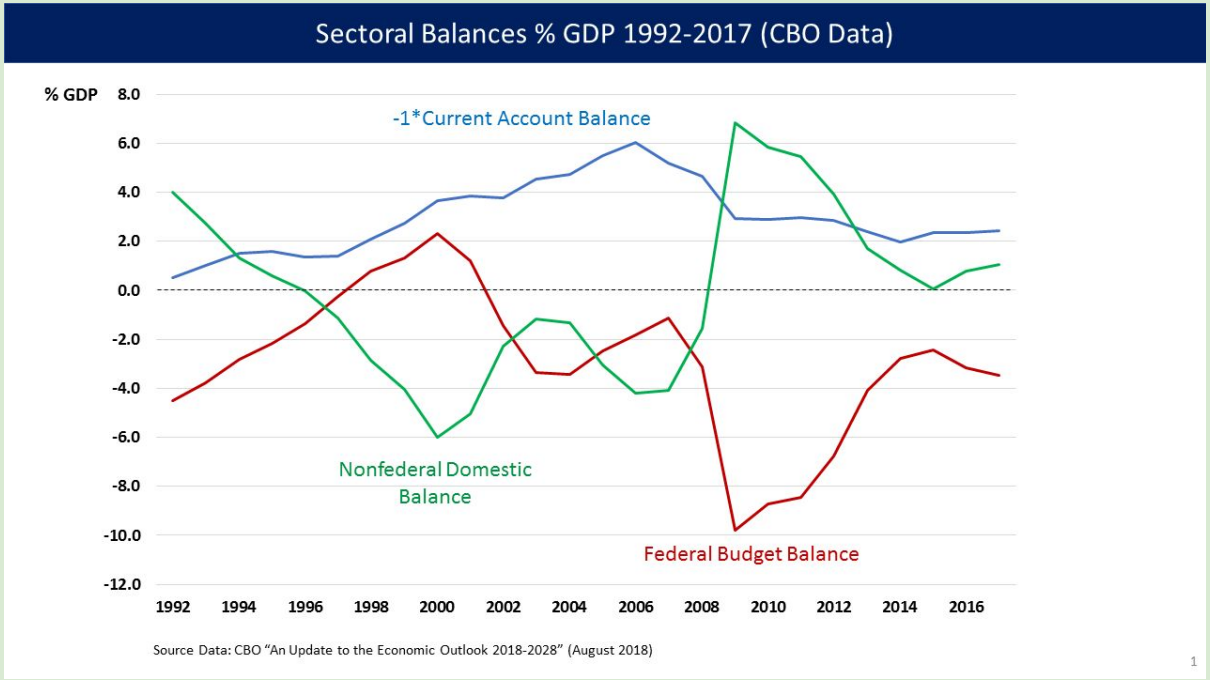
A Historical Look at the US Sectoral Balances (2)

- Trade deficit = a net outflow of financial assets to foreign sector
- Domestic private sector (households, firms) likes to save financial assets
- In order to save, households/firms must spend less than income
- With trade deficit, US private sector needs government deficit in order to maintain surplus

The Clinton Budget Surpluses

- The Clinton Administration ran budget surpluses in the late 1990s
- Private sector surplus decreased as government deficit decreased
- To maintain consumption, private sector took on debt (mortgages, credit cards)
- Private debt buildup led to recession and financial crisis

The Clinton Budget Surpluses - Graph



In summary...

- The federal government’s deficit provides the private sector’s savings!
- With the US running a persistent trade deficit, the government should also run a deficit in order for the private sector to maintain a surplus

We have no time ...

- To cover 6 chapters in textbook
- To tell you all the things we're not going to talk about.

We only have time for ...

- John Maynard Keynes, **The General Theory of Employment, Interest and Money** (1936)
- Persistence of mass unemployment during the Great Depression

Remember "define, measure, explain and predict"?

- So far, we've been mainly concerned with defining those concepts and relating them to one another with accounting identities.
- At the end of a given year, C + I + G + (X - M) adds up to GDP by definition

By looking at sectoral balances ...

- For any one sector to be in surplus -- i.e., to be accumulating net financial assets -- at least one other sector has to be in deficit

What we don't yet have ...

- Any theory which explain why output, income and employment settle at the levels we observe and try to measure

If we don't have any such theory, can't answer questions like:

- "How do we get millions of people back to work in the middle of a depression?"
- The situation Keynes was confronting in the mid-1930s.

Let's go back to the accounting identity for GDP:

$$GDP \equiv C + I + G + (X - M)$$

- Let's examine various types of spending
- How **volatile** is each type of spending?

Consumption Spending (1)

Consumption spending grows in a relatively stable manner

- At lower levels of income, people spend all their income on the purchase of goods and services
- Above a certain point, they no longer need to spend their entire income to survive
- They spend, say, 98% of each **additional** dollar of income
- We call that 98% (0.98) their **marginal propensity to consume**

Consumption Spending (2)

That means 2% of each **additional** dollar is **not** consumed

- We call that 2% (0.02) the **marginal propensity to save**
- But note that "saving" here is defined very cautiously as **"refraining from spending"**
  - No connotation of virtuously squirreling away money for future consumption
- Except for the rich, personal income and consumption spending track each other closely
- Hence, at the macro level, consumption spending is stable

Government Spending

Government spending also grows in a relatively stable manner

- Particularly when we add in state and local governments
- Can be foreseen in government budgets

Exports and Imports

Net exports: **(X - M)**

- Solely for the sake of a simpler presentation, we'll assume that exports and imports balance each other out
- So (X - M) equals 0.
- We'll further assume that the balance of trade doesn't change much.

If 3 types of spending are stable ...

$$GDP \equiv C + I + G + (X - M)$$

Stable ??? Stable Stable

Now, if three of the four categories of spending in GDP are stable ...

- ... and if we observe that GDP itself is unstable or volatile, ...
- .... where is the source of that volatility?

Only one place left: **investment spending**

Investment spending

Level of investment spending fluctuates much more than the levels of any of the three other categories

Beginnings of a macroeconomic **theory**:

- Firms' decisions to undertake -- or **not** undertake -- investment spending are the major source of variability in Gross Domestic Product

More formally:

- Changes in GDP are a function of changes in investment spending

Employment Varies with Output (1)

This is a simplifying **assumption**

- Overall level of employment varies with the overall level of output
- Employment varies with GDP

Granted, over long run, technological improvements and other social changes lead to improvements in labor productivity

- We can produce **more** output with the **same** amount of labor
- Or the **same** output with **less** labor

Employment Varies with Output (2)

But in short-run -- a year or two -- employment will vary with output

More formally: Changes in employment are a function of changes in output

Putting these observations together ...

Changes in employment are largely dependent on changes in investment spending

- At least in the short- to medium-term

This shouldn't surprise us

Remember Week 1?

General cycle of capitalist production is driven by quest for profits

$$\mathbf{M \rightarrow C \rightarrow Production \rightarrow C' \rightarrow M'}$$

A Story About Profits and Aggregate Output (1)

Let's say I'm a Vice President at General Motors

I walk into Mary Barra's office and say,

> *"SUV sales are good and our market research indicates they're going to get even better over the next two years.*
>
> *"Let's spend the money to re-tool our assembly lines to make even more SUVs. Our profits will increase."*

A Story About Profits and Aggregate Output (2)

Mary Barra and the GM Board can respond in one of two ways

First way:

> *"No, we don't expect SUV sales to increase. We don't need to spend the money to re-tool those assembly lines."*

No additional investment spending; no boost to GDP

A Story About Profits and Aggregate Output (3)

Second way:

> *"We agree with you. You're authorized to spend the money to re-tool the assembly lines. We expect more profits within two years time."*

Money spent counts as investment spending and GDP gets a boost

A Story About Profits and Aggregate Output (4)

Only once new SUVs have been built and come to market can we ask how profitable this process has been

Or whether it has been profitable at all!

Will **M** be transformed into **M′**?

If the public is still crazy about SUVs …

- GM′s profits will increase and that Vice President will get a big bonus.

A Story About Profits and Aggregate Output (5)

But if the public has all the SUVs it wants …

- Then the SUVs will end up sitting on dealers' lots till end of model year
  - Maybe even beyond
- Dealers will have to resort to discounts and rebates to move the goods
- GM might shut down assembly lines, layoff autoworkers
- Cut investment spending in the following year
- All of which would mean a big hit to GDP

Production for Profit and Decisions to Hire

So in Keynes' view, firms only "produce what they think they can sell at a profit." (Macro, 194)

> "Firms will only supply output for which they think there is a demand" (Macro, 195)

Factor hiring decisions into this:

> "Firms will employ the number of workers that they think they will need to produce the amount of output that they expect to sell at a profit." (Macro, 196)

Effective Demand

Level of demand for output that businesses can expect to sell at a profit

- Employment will vary with output (GDP)
- GDP will vary largely with investment spending by firms
- Investment spending by firms will vary largely with expectations of future profitability of sales resulting from investment spending -- effective demand

Employment Varies with Effective Demand

> "[E]ffective demand drives labour demand. Firms hire the number of workers they need to produce the amount of output they think they can sell at a profit." (Macro, 164)

And thus we have a **general theory of employment**

Importance of Expectations

In Keynes' thinking …

- Businessperson's expectations of future profitability drive investment spending and hiring decisions
- Hence expectations of profitability drive changes in overall output and employment

Importance of Expectations (2)

> "Entrepreneurs produce what they expect to sell, and there is no reason to presume that the sum of these production decisions is consistent with the full employment level of output either in the short run or in the long run."
>
> -- L. Randall Wray, *Why Minsky Matters* (2016), pp. 56-57

The Future Is Unknowable

We can develop probability estimates of risks of some things happening in the future

But there are other things for which we can't estimate risks at all

Risk versus Uncertainty (1)

Economist Frank Knight had earlier distinguished uncertainty from risk on that basis

- **Risk**: You **can** make probability estimates
- **Uncertainty**: You **cannot** make probability estimates

Risk versus Uncertainty (2)

Keynes: presence of uncertainty means that investment decisions are necessarily made in large part on the basis of non-quantifiable psychological factors:

- Hunches
- Guesses
- Hopes

Animal Spirits

To Invest or to Stay Liquid

If firms are uncertain about the future, they will ...

- Hold off on investment spending
- Hold off on hiring
- Just park their money capital in a bank account or CD
- Do so even if the interest rate on such an account is very low

Keeping capital in money form is a hedge against uncertainty

Expression of what Keynes calls the firm's **liquidity preference**

No Guarantee of Full Employment (1)

In the logic above, …

There is nothing to guarantee that the level of employment firms offer will be sufficient to provide a job to every worker who wants to work

- No guarantee that labor market will, as economists say, "clear"
- The economy can remain at a less-than-full-employment equilibrium for years
- **Underemployment equilibrium**
- Typical working of a capitalist economy does not produce full employment

No Guarantee of Full Employment (2)

If a capitalist economy not only does not produce full employment

- And at times produces high unemployment
- Then it doesn't make sense to rely solely on changes in businessmen's animal spirits to spark investment spending and a resurgence in output

In that case …

No Guarantee of Full Employment (3)

In that case…

We have to turn to one of the **other** types of spending which go into GDP

We have to turn to the one institution that can spend what it takes to **achieve the public purpose**

We have to turn to the **government**