Intro: What is this Course About?

and

Lecture I: Overview of Macroeconomics
<table>
<thead>
<tr>
<th>Lecture</th>
<th>Date</th>
<th>Title</th>
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<tbody>
<tr>
<td>1</td>
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<td>22-Apr</td>
<td>Long Term Economic Growth and Income Distribution</td>
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<td>3</td>
<td>29-Apr</td>
<td>Labor Market Overview</td>
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<td>4</td>
<td>6-May</td>
<td>Federal Deficits and the National Debt</td>
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<td>13-May</td>
<td>The Federal Reserve: Interest Rates, Yield Curves, Quantitative Easing, and the Target Inflation Rate</td>
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<td>6</td>
<td>20-May</td>
<td>The Regulation of Banks and the Complexity of the Financial System</td>
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<td>7</td>
<td>3-Jun</td>
<td>The Failure of Lehman Brothers and the Financial Panic of 2008</td>
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Exact timing is estimated
Initial Comments and Caveats

1) Economics is a **social** science, not a natural science!
   - There aren’t labs to “test” hypotheses, only economic statistics and inferences drawn from those “observations,” which are based on measures that may be frequently revised.
   - This is more true for macroeconomics because of the number of potential variables involved to fully model a national economy.
     - And, in macroeconomics, much of the data is quarterly, beginning after World War II, limiting the number of observations. (693 quarters since Dec 1945.)

2) Macroeconomics involves many analyses that directly involve public policies which economists and the public have strong priors about. In particular:

   The Role of Government in Managing the Economy

   **Most Importantly: Tax & Spending Policies**
Many critical questions in macroeconomics (e.g., size of fiscal multiplier) rely on time series data

- For quarterly data 1947-2014, # of observations = 272
- How many observations exist when there is a significant fiscal stimulus during recessions?
- Results are usually sensitive to nuanced statistical assumptions

Real world: **prior biases** of researchers, model construction and data transformation choices can be a material factor in estimation of the impacts of critical policy questions.
Initial Comments

As a consequence ...

1) There are ongoing debates within the economics profession over the effect of macroeconomic policies and whether they will improve or harm the economy in various economic conditions.

2) The media doesn’t help: In setting up point-counter-point formats makes these disagreements appear more material than they actually are within the economics profession

Surveys of Economists’ Opinions

Surveys of professional economists indicate that about 70% of them trained in macroeconomics will agree with what I’ll be teaching in this course.
What Do Economists Think about the 2009 Fiscal Stimulus?

Tuesday, July 29, 2014 12:03pm

Economic Stimulus (revisited)

Question A: Because of the American Recovery and Reinvestment Act of 2009, the U.S. unemployment rate was lower at the end of 2010 than it would have been without the stimulus bill. (The experts panel previously voted on this question on February 15, 2012. Those earlier results can be found here.)

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Responses

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<th>Disagree</th>
<th>Strongly Disagree</th>
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Responses weighted by each expert's confidence

<table>
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<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
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<td>0%</td>
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Source: IGM Economic Experts Panel
www.igmchicago.org/igm-economic-experts-panel
Two Quotes Illustrate the Internal Dynamics within the Economics Profession

Robert Lucas and Tom Sargent in 1978 (both Nobel Prize winners)

"Modern macroeconomic models are of no value in guiding economic policy and this condition will not be remedied by modifications..."

Paul Krugman in 2012 (Nobel Prize winner)

Freshwater economics became a kind of cult, ignoring and ridiculing any ideas that didn’t fit its paradigm. By 1980 Robert Lucas, wrote approvingly of how people would giggle and whisper when facing a Keynesian. What’s remarkable about that is that this was all based on the presumption that freshwater logic would provide a plausible, workable alternative to Keynes – a presumption that was not borne out by anything that had happened in the 1970s. And in fact it never happened.
Why the Debate over “Aggregate Supply Curve” Slopes Matter:

Consider the situation when the unemployment rate is high and policies to combat unemployment are being considered.

- For a given stimulus policy ...

  Conservatives will argue most of the effect will be in higher inflation with lead to very little reduction in unemployment.

  Liberals will argue most of the effect will be in reducing unemployment with very little effect on increasing inflation.
Economists and the Political Spectrum

% of Total Economists

- Harvard
- MIT
- UC
- Me
- Univ of Chicago

Left | Political Center | Right
Class Discussion Protocols

- The course is designed to teach macroeconomics and to engage the class in discussions about economics, not politics

- Some of you may disagree with the policy conclusions, but we’re not here to engage in political debates

- Questions are encouraged, but not anecdotes.

- Feel free to email me questions not answered:

  arnold@alcopartners.com

  I will begin subsequent lectures with relevant questions from the prior lecture
When Macroeconomics Began

It’s not a coincidence that Keynes wrote the “General Theory of Employment Interest and Money” in 1936

25% of the US Labor Force was unemployed at the trough of the Great Depression

Gray shaded areas are recessions
“Selected” Macroeconomic Variables

- Economic Growth in the Short run and Long run
- Employment and Unemployment
- Wages and Inflation
- Government Spending and Taxation
- Government Deficits and Debt
- Interest rates
- Investment and Savings Rates
- Money Supply
- Exchange Rates
- Balance of Payments and Balance of Current Accounts
- Productivity growth
- Financial Crises
Macroeconomic Policy Questions and Recent Events

- Why did the Great Recession Occur?
- Did the Fiscal Stimulus Designed by Keynesian Economists at the Beginning of 2009 Work?
- Why was the Recovery after the Great Recession Weaker than Average?
- The U.S. has Increased Debt by Trillions? Why aren’t We More Like Greece?
- What is Quantitative Easing and Why has the Fed Pursued It?
- Why did the Bankruptcy of Lehman Brothers lead to the Great Recession and What Should it Do Going Forward?
- How Can We Make Financial Crises Less Likely?
- Why Didn’t the Fed Raise Interest Rates Earlier this Month?
- Why is it that Technological Change is the Key Reason the Standard of Living Rises over Time?
The Macroeconomic System

International Events

Income

Employment & Unemployment

Deficits and Debt

Inflation

The Federal Reserve & Money

The Financial Collapse & Great Recession – Pt I

Fiscal Policy

Monetary Policy

Bank Regulatory Policy

The Macroeconomy: it’s an interconnected System
The System and Paradoxes: Example

“Paradox of Thrift”

- Every household decides to save more of their income
- Result:

  Total Savings Declines!

You’ll understand why this is true before the series of lectures has completed.
Macroeconomic Policy Matters!

Well Designed Macroeconomic Policies

- Faster economic growth
- Stable economic growth
- Lower unemployment rates
- Low inflation rates

Poorly Designed Macroeconomic Policies

- Slower economic growth
- Significant economic fluctuations
- Higher unemployment rates
- Higher inflation rates
Macroeconomic policies implemented post-Keynes have made a huge socially meaningful difference to macroeconomic performance and improving the lives of human beings in virtually all industrialized economies.

Recessions have not been eliminated, but they have been less frequent and of shorter duration.

Gray shaded areas are recessions.
Recession Stats Pre vs. Post Keynes

We live in a Post-Keynesian Macroeconomy, even in the SF Bay Area!
Keynes and Macroeconomic Policy

In a later lecture, we’ll be talking about the impact of the Fed’s change in procedures beginning in about 1993 that fundamentally changed the behavior of the inflation rate.

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<td>1992-2018</td>
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<td>1.9</td>
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GDP Measurement, Recessions and Recoveries
Gross Domestic Product: Measurement

1) Gross Domestic Product is the **international standard** used to measure nations’ total production of goods and services

- It was developed after the Great Depression as the basis for building what are called the National Income and Product Accounts (or NIPA)
- It was developed in part to explain huge fluctuations of employment and unemployment that occurred during the Great Depression
- It is not a perfect accounting measure of the target concept
  - There is no **perfect** measure of national in the real world
There has existed a strong positive relationship between economic growth and the growth in the number of jobs for a very long time.

This is what “national income accounting” was designed to do.
The fundamental identity of national income accounting is a triangle of identical measurement results.
GDP (Gross Domestic Product) is:

- The current market value of all
- final goods and services
- newly produced
- in the domestic economy during a
- specified period of time
GDP: Expenditure Approach

GDP (Gross Domestic Product) is also:

- The total spending on all final goods and services produced within the domestic economy during a specified period of time

\[ \text{GDP} = \text{ Consumption Expenditures} + \text{ Investment Expenditures} + \text{ Government Purchases} \neq \text{ Government Expenditures} + \text{ Net Exports} (\text{NX}) \]

\[ \text{GDP} = C + I + G + NX \]
Government Purchases of Goods and Services vs. Total Expenditures

Trillions of $2018

[Graph showing government purchases and transfer payments]

Federal Gov't
- Fed-TotExp
- Fed-NIPA

Transfer Payments

State and Local Gov't
- S&L-TotExp
- S&L-NIPA

Transfer Payments
### GDP 2018 Q2 - Some Highlights

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<td>Services</td>
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<td><strong>Gross private domestic investment</strong></td>
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<td>Nondefense</td>
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<td>State and local</td>
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<tr>
<td><strong>Gross domestic product</strong></td>
<td><strong>20.4</strong></td>
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- **68% of GDP**
- **17.5% of GDP**
- Small because it’s a net #.
- Δ Gross flows → “globalization”
- 90,000 units.
- Expenditures on infrastructure>> Federal expenditures
Trends as % of GDP
Imperfections

Examples of GDP Measurement Imperfections:

- Housework and child rearing
  - GDP increases when a child rearing spouse takes a job and hires a “nanny” (and files the tax reports)

- Underground economy
  - “Off the book” transactions
  - Illicit unreported activities

- Environmental improvements and deterioration
  - Cleaner/dirtier air and water
  - Lost species/habitats
  - Global warming
What Does Real Mean?

Nominal vs. Real GDP:

- Prior table was in current dollars
- In order to understand “real” increases in total production of goods and services requires measurement of price changes
- This is the world of “inflation measurement” which we won’t have a lot of time to discuss.
  - It’s highly mechanical and based on “Price Index Theory.”
- Macroeconomists are very focused on measurement of real GDP because it is what correlates to employment growth
  - Employment is the basis for improvement of individual and family standard of living
Key Macroeconomic Relationships

They are ALL determined by similar macroeconomic forces.
GDP – Jobs – Unemployment Volatility

GDP

Jobs

Unemployment

Δ GDP

Δ Jobs

Unemployment
Business cycles are the short-run fluctuations in aggregate economic activity around its long-run growth path.

Economic activity typically follows a wavy line over time with four phases:

- Trough
- Business cycle expansion (recovery)
- Peak
- Business cycle contraction (recession)
Business Cycle Timing and the NBER

Peaks and troughs are officially designated by the National Bureau of Economic Research (NBER) Business Cycle Dating (BCD) Committee.

- Typically wait 9 – 24 months after the fact before deciding on turning points.
- Multiple factors are used by the committee used to determine dates of peaks and trough. (They publish a memo on www.nber.org)
- Members

Robert Hall, Chair -- Stanford  
Martin Feldstein -- Harvard  
Jeffrey Frankel -- Harvard  
Robert J. Gordon -- Northwestern  
James Poterba -- M.I.T.  
Valerie Ramey -- UC San Diego  
Christina Romer -- UC Berkeley  
David Romer -- UC Berkeley  
James Stock -- Harvard  
Mark W. Watson -- Princeton

Determine where the gray shaded areas that are in the graphs used in lecture
This graph is why there is macroeconomics:

65 years of data containing huge changes in technology, social institutions, politics, etc.

Yet, recessions still occur and the most recent one was the worst one in the entire period.
## Recessions and Jobs

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<tr>
<th>Peak</th>
<th>Trough</th>
<th>Length (Mths)</th>
<th>%Δ GDP</th>
<th>+Δ Un Rate</th>
<th>Jobs</th>
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Recoveries and Job Creation

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Recoveries are JOB CREATION ENGINES
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<th>% Δ GDP</th>
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<td>Nov-01</td>
<td>Dec-07</td>
<td>73</td>
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<td>5.5</td>
<td>-0.5</td>
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<tr>
<td>Jun-09</td>
<td>Dec-18</td>
<td>115</td>
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<tr>
<td>Avg</td>
<td></td>
<td>65.5</td>
<td>24.9</td>
<td>14.9</td>
<td>-2.8</td>
</tr>
</tbody>
</table>
Key Macroeconomic Relationship II

\[ \Delta \pi > 0 \]

\[ \Delta \pi = 0 \]

\[ \Delta \pi < 0 \]

Frequently referred to as the Phillips Curve.

This relationship has evolved over time to a world of policy constraints and insights into how the Fed chooses to manage the US economy.
If Recessions are So Costly, Why Do We Have Them?

And How the Answer is Determined by...

Short-run Policies to Maintain Relative Inflation Stability
CPI Inflation Rate (%)
Most recessions have been generated by the Federal Reserve in order to reduce inflation.
Stair Steps to Higher Inflation

Current Core Policy Beliefs

If the Federal Reserve allows inflation to become higher, economic agents (you and me and others) will begin to expect it and the higher rate will be incorporated in economic decisions.

Ever higher inflation

Economic agents will learn this their policy and reset inflationary expectations

Even higher inflation
The Costs of Inflation

Inflation imposes costs whether inflation is:

**Anticipated**
- Shoe-leather costs
- Menu costs
- Tax distortions
- Increased variability of relative prices
- Loss of the dollar yardstick

**Unanticipated**
- Increased uncertainty
- Increased variability of relative prices, and
- Inflation uncertainty is higher when the level of inflation is already high.
However, it is Important to Remember

- There doesn’t exist a magic threshold inflation rate at which “inflation becomes too high”
- There DOES EXIST a magic lower bound that no good economist wants to drop below: 0%
  - Costs / benefits of inflation are not symmetric
  - Because of credit deflation will create incentive for behavioral responses that have negative macroeconomic repercussions
Asymmetric Social Benefits/Costs of Inflation

Social Benefits

Deflation

Social Costs

Inflation

2%

~4%
What is the relationship?

If these are the data, how can there be a trade-off?
Unemployment vs. Inflation

%Δ CPI – Food & Energy

Connecting the data points
What explains these different periods?
Unemployment vs. Inflation: Missing Periods

%Δ CPI – Food & Energy

Stagflation (70s)

Internet Revolution

What relationship?
Unemployment vs. Inflation

%Δ CPI – Food & Energy

This is what the Federal Reserve is Worried About
This is the unemployment rate consistent with the economy’s long-run **steady state**.

Milton Friedman (1968 AEA Presidential Address) defined it as follows:

> The "natural rate of unemployment" ... is the level that would be ground out by the Walrasian system of general equilibrium equations, provided there is imbedded within them the actual structural characteristics of the labor and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labor availabilities, the costs of mobility, and so on.
Friedman’s Address Changed Economic Theory

The “Natural Rate of Unemployment” became

\[ \text{NAIRU} = \text{Non Accelerating Inflation Rate of Unemployment} \]

\[ \text{NAIRU} \equiv \text{The “Full Employment” unemployment rate} \]

Potential GDP is the amount of GDP that is produced when \( U = \text{NAIRU} \)
Friedman (and Phelps) Insight Led to This:

Supply Side vs. Demand Side of the Economy:

- GDP is based on measurement of **what was produced**
- We also need a measure of what can “potentially be produced when resources are fully employed.”
- This is called “**Potential GDP**”
- “**GDP Gap**” = (Actual GDP – Potential GDP)/Potential GDP
- Potential GDP is calculated by estimating the rate of unemployment such that the inflation RATE has no propensity to change -- that is, @ NAIRU
The natural rate of unemployment (NAIRU) is the rate of unemployment arising from all sources except fluctuations in aggregate demand.

Estimates of potential GDP are based on NAIRU, which is a key input into CBO's projections of inflation.

Potential GDP is the amount of GDP that is produced when U=NAIRU
NAIRU (％)

Real Potential GDP ($T)

2018$
Labor Force * (1-NAIRU) = Level of Employment @ Full Employment

Level of Employment * GDP/Employed = Full Employment GDP
NAIRU \hspace{1cm} Potential GDP

Checklist:

✓ Measures of Labor Force
✓ Measures of Output per Worker
* NAIRU

NAIRU is estimated by the Congressional Budget Office but there it can only be estimated within a range.

NAIRU (%)
Measurement of NAIRU and Potential GDP

- Extraordinarily controversial to measure because of policy implications and politics
- The Congressional Budget Office **MUST** calculate Potential GDP in order to provide guidance to Congress regarding impacts of policy decisions on future budgets, deficits, and debt
Changes in the NAIRU

The NAIRU can vary over time for several reasons that impact precisely where there exists an “equilibrium” in national aggregate demand and supply:

1. Demographics and Labor Force Participation Rates
2. Composition of the labor force
3. Surprises in productivity growth
4. Other supply side shocks (world oil prices)
Real & Potential Real GDP in Trillions of $2012

Unemployment Rate and NAIRU %

When Actual GDP < Potential GDP
U > NAIRU
Why Potential GDP?

1949Q1 – 2018Q3

Directly addresses whether macroeconomic policies should be used to stimulate economic growth in order to reduce unemployment.
Potential Real GDP vs. Actual Real GDP

Real Potential and Real GDP in $Trillions Current Dollars

Gray shaded areas are recessions
GDP GAP

Real Potential and Real GDP in $Trillions Current Dollars

= $4.9 Trillion in Lost Output
Periods following troughs are usually when Real GDP grows faster than potential and the unemployment rate is lowered.
Can There Be “Positive Gaps?”

When $U < \text{NAIRU}$ then GDP > Potential

GDP and Unemployment “Gap” (%)
What about Today?

There is disagreement between POTUS and the Fed on the Interpretation of this Measure
Short Term Macroeconomic Policy
What Policies Should Accomplish

<table>
<thead>
<tr>
<th>Economic Position</th>
<th>Appropriate Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recessions: Economy is shrinking</td>
<td>Stimulate economic growth</td>
</tr>
<tr>
<td>Early Recovery: Economy is growing but unemployment is high</td>
<td></td>
</tr>
<tr>
<td>Late recovery: inflation exceeding policy target</td>
<td>Constrain economic growth</td>
</tr>
</tbody>
</table>
Key Concept from Keynes: Aggregate Demand

GROSS DOMESTIC PRODUCT: Total Spending by Households, Businesses, & Government + Net Exports

Government

Goods & Services
Purchases

Businesses

Households

Employment
What Makes Macroeconomics ... Macroeconomics?

**Full Employment Economy**
- Government
- Businesses
- Households

**Recession Economy**
- Government
- Businesses
- Households

2009Q2

Full Employment GDP (2009Q2) ≈ $15.5 Trillion

Actual GDP = $14.4 Trillion

**GDP “Gap” ~ $1 Trillion in 2009**
Economic Policies that Stimulate Total Spending

**Fiscal Stimulus:**
- Government purchases of goods and services (e.g., highways)
- Reductions in tax rates to stimulate consumer demand
- Automatic stabilizers (e.g., unemployment insurance, food stamps, other safety net programs)

**Monetary Stimulus:**
- Reductions in the real level of interest rates to stimulate consumer demand and private investment
Lower taxes can lower the cost of new investment leading to additional spending.
Lower interest rates lowers the cost of new investment for businesses, leading to increased spending by households, which in turn increases borrowing at lower interest rates for businesses, and this cycle continues.
Aggregate Demand and Aggregate Supply

Aggregate Demand in Recession

Potential GDP

Desired Aggregate Demand

Aggregate Supply

Inflation

\( \pi \)

GDP

GDP

Potential GDP
Aggregate Demand and Aggregate Supply

Aggregate Demand

Conservatives believe in this

Potential GDP

Liberals believe in this

Potential GDP

Aggregate Supply

\( \pi \) Inflation

GDP
2009 Fiscal Stimulus Worked!

Deficit/GDP Ratio (%)

Δ Employment (000)
Understanding Macroeconomic Policy Debates

It’s a social science

- We have “official” (CBO) estimates of where the economy is that are used to guide Congress

- Ongoing debate within the Federal Reserve between those that think the economy has great propensity to inflate and so we should accept higher levels of unemployment AND

- Those that see economic slack and very low inflation rates as indicating that we can push the economy even more

This debate is a key component to what the Federal Reserve says and does with regard to interest rates last year and just before Xmas!
Results of Short – Term Economic Policies

Recessions continue to occur

Inflation has largely stabilized

Unemployment (%)

Inflation (%)

Pre-Keynes

Post-Keynes

Pre-Keynes Pre-Targeting

Post-Targeting
Results of Short – Term Economic Policies

Unemployment (%)

Inflation (%)

Recessions continue to occur

Inflation has largely stabilized
## Results of Short – Term Economic Policies

<table>
<thead>
<tr>
<th>Period</th>
<th>Average</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GDP Gap</td>
<td>U-NAIRU</td>
</tr>
<tr>
<td>1949Q1-1959Q4</td>
<td>0.9</td>
<td>-0.7</td>
</tr>
<tr>
<td>1960Q1-1969Q4</td>
<td>1.2</td>
<td>-0.9</td>
</tr>
<tr>
<td>1970Q1-1979Q4</td>
<td>-0.3</td>
<td>0.1</td>
</tr>
<tr>
<td>1980Q1-1989Q4</td>
<td>-2.1</td>
<td>1.2</td>
</tr>
<tr>
<td>1990Q1-1999Q4</td>
<td>-0.9</td>
<td>0.3</td>
</tr>
<tr>
<td>2000Q1-2007Q4</td>
<td>-0.6</td>
<td>0.0</td>
</tr>
<tr>
<td>2008Q1-2016Q2</td>
<td>-2.9</td>
<td>2.7</td>
</tr>
<tr>
<td>2016Q3-2018Q2</td>
<td>-0.5</td>
<td>-0.3</td>
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</table>
Results of Short – Term Economic Policies

<table>
<thead>
<tr>
<th>Period</th>
<th>Average U-NAIRU</th>
<th>Average π</th>
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<tbody>
<tr>
<td>1949Q1-1959Q4</td>
<td>-0.7</td>
<td>1.8</td>
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<tr>
<td>1960Q1-1969Q4</td>
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<tr>
<td>1970Q1-1979Q4</td>
<td>0.1</td>
<td>7.1</td>
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<td>1980Q1-1989Q4</td>
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<td>1.7</td>
</tr>
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<td>2016Q3-2018Q2</td>
<td>-0.3</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Recessions continue to occur and are a challenge economic policy.
Results of Short – Term Economic Policies

Standard Deviation of Inflation Rate

<table>
<thead>
<tr>
<th>Period</th>
<th>Standard Deviation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>π</td>
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</tr>
<tr>
<td>1949Q1-1959Q4</td>
<td>1.3</td>
<td>2.5</td>
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<tr>
<td>1960Q1-1969Q4</td>
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<tr>
<td>2016Q3-2018Q2</td>
<td>0.4</td>
<td>0.5</td>
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</table>

Unemployment rate has been low and steady for 2 years but was preceded by 8 years of high volatility.
The Federal Reserve has achieved relative control over inflation but not economic growth and unemployment.

The economy is currently humming with low unemployment, low inflation, low volatility of both.

But, then, it was humming in 2000-2007 preceding the Great Recession and look at what followed in 2008-16: the high unemployment of the post-war era.