Key Economic Performance Metrics

**Negative Results**

- Prior to the pandemic, the US government did NOT manage its fiscal position prudently and deficits were extraordinarily large for an economy performing so well.

- The distribution of income and wealth had become much worse over the prior 30 years.

- Economic growth as measured by Real Potential Gross Domestic Product (GDP) is low and projected to be low by historical standards.
Deficits and Debt
Federal Debt

- It is equal to the summation of ALL PAST DEFICITS minus ALL PAST SURPLUSES

- Economists don’t care about Debt per se. They care about the Debt/GDP ratio

  - Debt/GDP is a true economic measure
  - The correct definition of the debt is “debt held by the public:

Warning:

Beware of debt definitions uttered by media and politicians.
Statements Designed to Generate Anxiety

Debt per person

- “Exceeds $50,000/person”
- Sounds large
- It’s meaningless, because the federal government lives “forever” in economic terms
  - This is the key difference between the Federal gov’t and households
  - U.S. Treasury Debt doesn’t have to be paid off ...EVER in a growing economy and largely hasn’t.
- Any interest paid to a U.S. resident represents a “transfer payment” within the economy.
- Interest paid to foreign holders of U.S. represents income payments out of the country and represents a real cost to the nation.
Distinction between Gross Federal Debt and Debt Held by the Public

- “Debt of the US is almost equal to GDP” is a reference to debt held by the public + debt held by government agencies (e.g., SSA)
- Gross Federal Debt does NOT represent U.S. Treasury debt
- Difference $\approx$ $5.9$ Trillion held in “government accounts”
Economists Care About the Debt/GDP Ratio not Debt

Debt/GDP in %

$5.9 \text{T is Held by SSA and a few other.gov't trust funds}
Past Deficits & Surpluses and Debt

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt, Jun 1939</td>
<td>$41.3B</td>
</tr>
<tr>
<td>+ Σ Deficits - Surpluses</td>
<td>$15.0T</td>
</tr>
<tr>
<td>≈ Debt, Sep 2019</td>
<td>$16.8T</td>
</tr>
</tbody>
</table>
More Recent Data on Deficits and Debt

% of GDP
Who Holds Federal Debt?

$ Trillions
Japan and China are the largest foreign holders of US Treasuries, but hundreds of other countries do. The third largest holder is about 1/5 the size of China.

There is no evidence that foreign governments are “dumping U.S. Treasury debt”
Income Distribution
Income Distribution

- Income distribution has become a “hot topic” in most advanced economies
  - In the past, it was not usually an issue incorporated in macroeconomic discussions
  - I’m covering it briefly because I’d be remiss in not discussing
- There are some first principles to recognize
- There are now some longer term trends internationally that has many policy makers concerned.
Income Distribution – Preliminary Comments

Do Economists Know What an Optimal Income Distribution Is?
- No
- We know what is “fairer” but we don’t know what’s “fair.”
- So, all of the analyses are about how over time the economy has become “less fair.”

Can Economists Claim that When Income is Distributed More Equally, Economies will Grow Faster?
- No
  - There are many factors influencing why economy A grows faster than economy B in different periods of time
  - Data on distribution of income is one factor and simply doesn’t explain much of the growth differentials either over time or across countries.
Some propositions that underlie all of the discussions

- Given the general level of prosperity in the US and other developed nations, **social welfare** is improved by providing some kind of “social safety net”
  - All developed countries have social safety nets
  - The size and amount of resources devoted to providing a safety net are highly controversial
  - Any social safety net involves taxing A to pay B
  - There are legitimate concerns about incentive effects
  - Biggest transfers in the economy: cross-generational, a.k.a., entitlement programs: Social Security and Medicare

- Equality of **opportunity**, independent of inherited wealth and income is a generally shared social goal
Income Distribution – Preliminary Comments

- There are significant differences in measurement and implications of income vs. wealth distributions
  - We have far more and far better measures of income distribution
  - Those measures that we do have of wealth distribution indicate wealth distributions are far more “unequal” than income.
- Capital income raises far more measurement issues than wage and salary income
Two Major Caveats

- None of the data that have recently used to talk about the top 1% take into account transfers. They are all “pretax”
  - Recent research is using tax data to analyze the top 1%
  - The Piketty study does not account for transfers
- Mobility between groups is not captured in the data shown and is much harder to analyze
  - Some preliminary research indicates “upward mobility” is limited and has not improved over time and varies significantly by region.
If incomes are equally distributed:

% of Households or Families

Income Measures
A Quick Lesson in Statistics II

If incomes are **NOT equally distributed**:

- **Mean/Median Ratio Describes Relative “Inequality”:**
  - the Larger the Ratio the Greater the Inequality
Mean HH income has risen over time while median HH income has been relatively flat.

Illustrates the difference between the focus “on average” vs. “half the households”
Mean Income by Quintile

HH Income in Thousands of $2019

Top 5 Pct
80-95th Pct
4th Quint
3rd Quint
2nd Quint
Lowest Quint
## Mean Income by Quintile – Avg Growth Rates

<table>
<thead>
<tr>
<th>Group of HH</th>
<th>Annual Growth Rate</th>
<th>Doubling Time (Yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest 20%</td>
<td>0.3</td>
<td>234</td>
</tr>
<tr>
<td>2nd 20%</td>
<td>0.3</td>
<td>208</td>
</tr>
<tr>
<td>3rd 20%</td>
<td>0.5</td>
<td>150</td>
</tr>
<tr>
<td>4th 20%</td>
<td>0.7</td>
<td>94</td>
</tr>
<tr>
<td>80-95th %</td>
<td>1.1</td>
<td>64</td>
</tr>
<tr>
<td>Top 5%</td>
<td>1.7</td>
<td>41</td>
</tr>
</tbody>
</table>
Changes in Share of Income 1967-2019

There has been a significant shift in the share of income from the bottom 80% of households to the top 20% of households.
Household incomes have become much less equally distributed over the past 50 years.

This trend does not vary much by ethnicity.
The Gini Coefficient

A Method for Describing Income Distribution
The Gini Coefficient

- Some of the data is going to make use of the single measure of income distribution called the Gini Coefficient (after Italian statistician Corrado Gini).
- If all families have exactly the same income and we compare the share of families to the share of total income, we get a 45 degree line:

% of Total Income

Pct of Total Families

Equal Distribution of Income
The Gini Coefficient (cont.)

- If family incomes are not equally distributed we get a curved line.
The Gini Coefficient (cont.)

\[ \text{Gini} = \frac{A}{A+B} = 2A \]

% of Total Income

\[ 0 \leq \text{Gini} \leq 1 \]

Larger Gini → More Inequality
Distribution of Income of Household

According to US Commerce Dept. data distribution of income by household has become less equal.
Mean/Median Ratio vs. Gini Coefficient

Gini Coefficient

Less Equal

More Equal
Both measures are signaling the same trends: distribution of income is getting less and less equal and the phenomena is common across ethnic groups.
According to Survey of Consumer Finances data distribution of net worth of household has become less equal.
Distribution of Income vs. Net Worth

% of Total HH Net Worth or Income

Net Worth 2019
Gini = .85

Income 2019
Gini = .48

Equal Distribution Line

% of Households

% of Total
Poverty Pre-Crisis

% of Each Age Cohort Living in Poverty

Poverty among children increases in recessions!

Poverty among children declines in expansions!

Millions of People

Under 18
18-65
65+

65+
18-65
Under 18
Poverty among elderly is slowly declining but there remain substantial differences between white and non-white elderly.
It’s a measure of a direct impact of poverty and an incredibly successful government program to address HUNGER.

The drop in 2018 was due to the federal gov’t shutdown.
Causes

Ongoing Research to Understand Why Has Pretax Distributions of Income become Less Equal in the last 40 Years. Hypotheses:

- Weakening of unions?
- Illegal immigration?
- International trade?

Returns to job skills?

- It is the one hypothesis that has generated results
- Wages and returns to education have been “bifurcating” on an international scale

Research has not found a “smoking gun” from these sources
% Change in Hourly Earnings 1965-2010

Pct. Change in Real Hourly Earnings 1965-2010

Males

Females
Mitigating Public Policies

- Social Safety Net
  - Social Security
  - Medicare/Medicaid/Affordable Care Act
  - Food Stamps & other welfare programs
  - Earned Income Tax Credit

- Progressive Income Tax Schedules (potentially)

- Estate Tax

- Property Taxes
  - Proposition 13 has created long list of “winners” and “losers”

- Public Education (K-12) and Community Colleges

- Federal Grants for the Less Affluent to Attend College
Long-term Economic Growth
Real Potential GDP

This is about a slowdown in the rate of technological progress.
Rising standards of living for humans really begins with the industrial revolution!
US Long Term Economic Growth

Real Per-Capita Income (Th $2020)

If history repeats in the long run

Trend = 2.07%/Year

Black line is Real GDP /Population

<table>
<thead>
<tr>
<th>Year</th>
<th>Factor</th>
<th>Real GDP per Capita $000</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>1</td>
<td>$71,279</td>
</tr>
<tr>
<td>2053</td>
<td>2</td>
<td>$142,558</td>
</tr>
<tr>
<td>2087</td>
<td>4</td>
<td>$285,115</td>
</tr>
<tr>
<td>2121</td>
<td>8</td>
<td>$570,231</td>
</tr>
</tbody>
</table>
Long Term Economic Growth and Distribution

- If “all boats rise with the tide” the table below has significant implications for raising the standard of living for households and families.

- If over the next generation the distributional issues continue, the political and social implications will be aggravated.

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Key Concept – “Income Doubling”

- Small Differences in Economic Growth make Big Differences to Improvements in the Standard of Living over time
- Illustration using “Doubling of Real GDP per Capita”

<table>
<thead>
<tr>
<th>Growth Rate</th>
<th>Years to Double Per</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0%</td>
<td>69</td>
</tr>
<tr>
<td>1.5%</td>
<td>46</td>
</tr>
<tr>
<td>2.0%</td>
<td>35</td>
</tr>
<tr>
<td>2.5%</td>
<td>28</td>
</tr>
<tr>
<td>3.0%</td>
<td>23</td>
</tr>
<tr>
<td>5.0%</td>
<td>14</td>
</tr>
<tr>
<td>7.0%</td>
<td>10</td>
</tr>
</tbody>
</table>
This is why *EVERY* developed and less developed country wants to increase its LONG RUN growth rate:

Small increases in growth rates lead to perceived and actual increases in the rate the standard of living improves.
Key economic policies are tied to projections of the economic potential of the nation (i.e., “Potential GDP”)

- Social Security
- Health Spending: Medicare, Medicaid, and the Affordable Care Act
- Federal taxation policies
- Federal spending policies
- Projections of future deficits and debt

Whether or not economists can accurately “forecast” Potential GDP, it is required by the inherent nature of longer term consequences of many policy issues.

*And it is Method for Assessing Economic Policies*
Key Equation and Potential GDP

Over Many Years

\[ \% \Delta \text{ GDP} = \% \Delta \text{ Labor} + \% \Delta \text{ Labor Productivity} \]

- Pop growth
- Age distribution
- Immigration

- Capital
- Education
- Technological \( \Delta \)
Since Economic Growth is So Important ...

What explains long term economic growth?
Since Economic Growth is So Important ...

A little bit of math

- Suppose we break GDP into workers hours (L) and how much each worker produces on average (GDP/L).
  - GDP/L is also called output per hour or "labor productivity"
  - The U.S. Dept. of Labor has an entire department that tracks and studies labor productivity

\[
\text{GDP} = L \times \text{GDP/L}
\]
Since Economic Growth is So Important ...

- A little bit of math

\[ GDP = L \times \frac{GDP}{L} \]

\[ \% \Delta GDP \approx \% \Delta L + \% \Delta (GDP/L) \]

In Words:

Economic Growth over time is explained by the growth rate of labor + the growth rate of labor productivity
Growth of Labor over Time

Three factors explain the growth of labor input

- Working Age Population Growth

- The share of working age population that *chooses* to be in the labor force *AND* has a job or is looking for one
  - This is called the “Labor Force Participation Rate”
  - To avoid effects of recessions, when analyzing “long-term” growth trends economists analyze periods of relatively “full employment”

- Worker education/skills. Also known as “Human Capital”

- Usually measured in terms of education and employment experience
Labor Force Participation Rates – Selected Cohorts

LFPRs (%)

LFPR = Labor Force(i)/Population(i)
i = cohort by age, gender and ethnic group
Growth of Labor Productivity over Time

- Two factors explain the growth of labor productivity
  - Growth in the capital/labor ratio (a.k.a., “capital deepening” or more capital and tools per worker)
  - Technological change

\[
\% \Delta \frac{Q}{L} = \omega \% \Delta \frac{K}{L} + \text{rate of technological change}
\]

Where \( \omega \approx 0.36 \)

These vary over time, but there are some very important conclusions from the research
Key Equation and Potential GDP Growth

\[ \% \Delta GDP = \% \Delta \text{Labor} + \% \Delta \text{Labor Productivity} \]
Sources of U.S. Labor Productivity Growth

Avg. Annual Growth Rate (%)

%Δ Q/L = ω %Δ K/L + rate of technological change

Source: CBO = Congressional Budget Office
Sources of U.S. Labor Productivity Growth

1950-2019

- **Technological Change**: 67%
- **Capital Deepening**: 33%

About 2/3 of the increase in standard of living is from technological change. About 1/3 is from having more capital per worker.
Sources of GDP Growth

Avg. Annual Growth Rate of Potential GDP (%)

\[ \% \triangle \text{GDP} \approx \% \triangle L + \% \triangle (\text{GDP}/L) \]

Source: CBO = Congressional Budget Office
What do you see?

There has been significant decline in economic growth rates across the most advanced economies.
The growth rate of capital per worker contributes to the growth of labor productivity weighted by its share of output.

However ...

The value of the capital stock is the accumulation of past purchases of capital less the accumulation of past retirements and depreciation.

So, based on estimates, the value of capital stock is about 10 times the value of investment.

And the rate of deterioration and retirement is about 5% of existing capital.

It takes a material increase in the investment to have a meaningful impact on the growth rate of labor productivity.
Virtually all of the research over 50 years points to technological change as the key source of improving the standard of living and having a skilled workforce to produce goods and services.

Increasing investment per worker is helpful, but its contribution is relatively small compared with technological change.

- It takes a large increase in investment as a share of GDP to have a meaningful effect on the growth rate of labor productivity.

So, it’s all about generating more innovation.

If countries knew how to “create Steve Jobs”, they would.

Social returns to higher education continue to be significant.
Education Challenges

- Keeping the least affluent teens IN SCHOOL
- Providing equal educational opportunities to all income classes
- Keeping cost of college education low
- Public financing constraints: Recessions reduce budgets at state and local level that finance K-12, Community Colleges, and Public Universities

*General Economic Rule*: The more the US privatizes the cost of education the lower the growth in human capital and the potential growth rate of the entire economy, played out over decades.