

October 25, 2016

The Road Ahead

By Howard Newman, Chairman and CEO

PINE BROOK

What to Listen for Today

1.

Where's the Growth?

2.

Productivity and Labor

3.

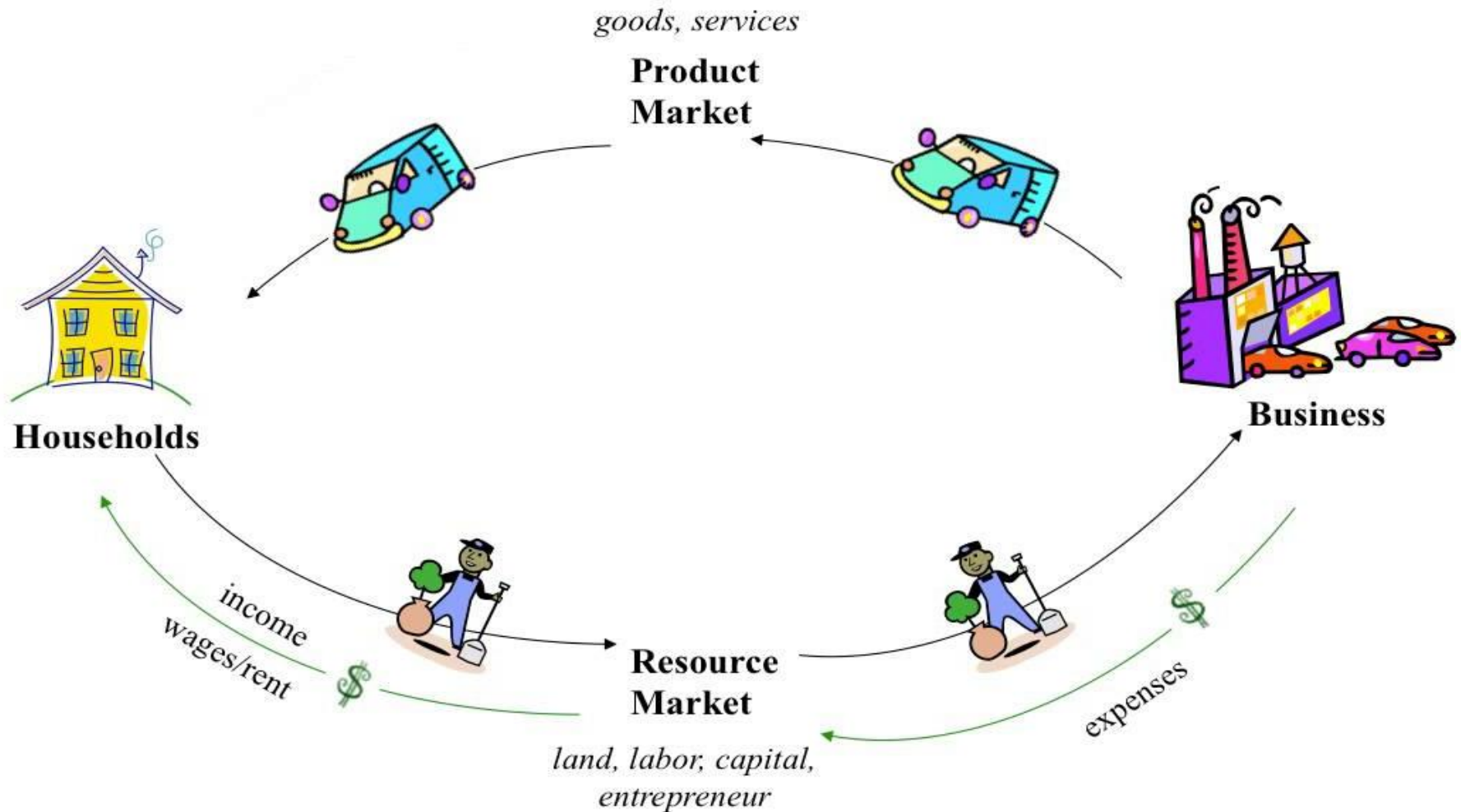
Profitability and Income Distribution

4.

The Road Ahead

Where's the Growth?

Macroeconomics Built On Circular Flow



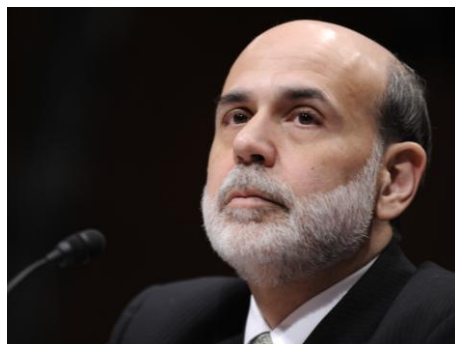
Why Aren't We Growing? – Macroeconomists' Views



**Secular Stagnation?
Larry Summers**



**Liquidity Trap?
Paul Krugman**



**Savings Glut?
Ben Bernanke**



**Debt Overhang /
Financial Repression?
Ken Rogoff**



**Monetary Policy?
Marty Feldstein**

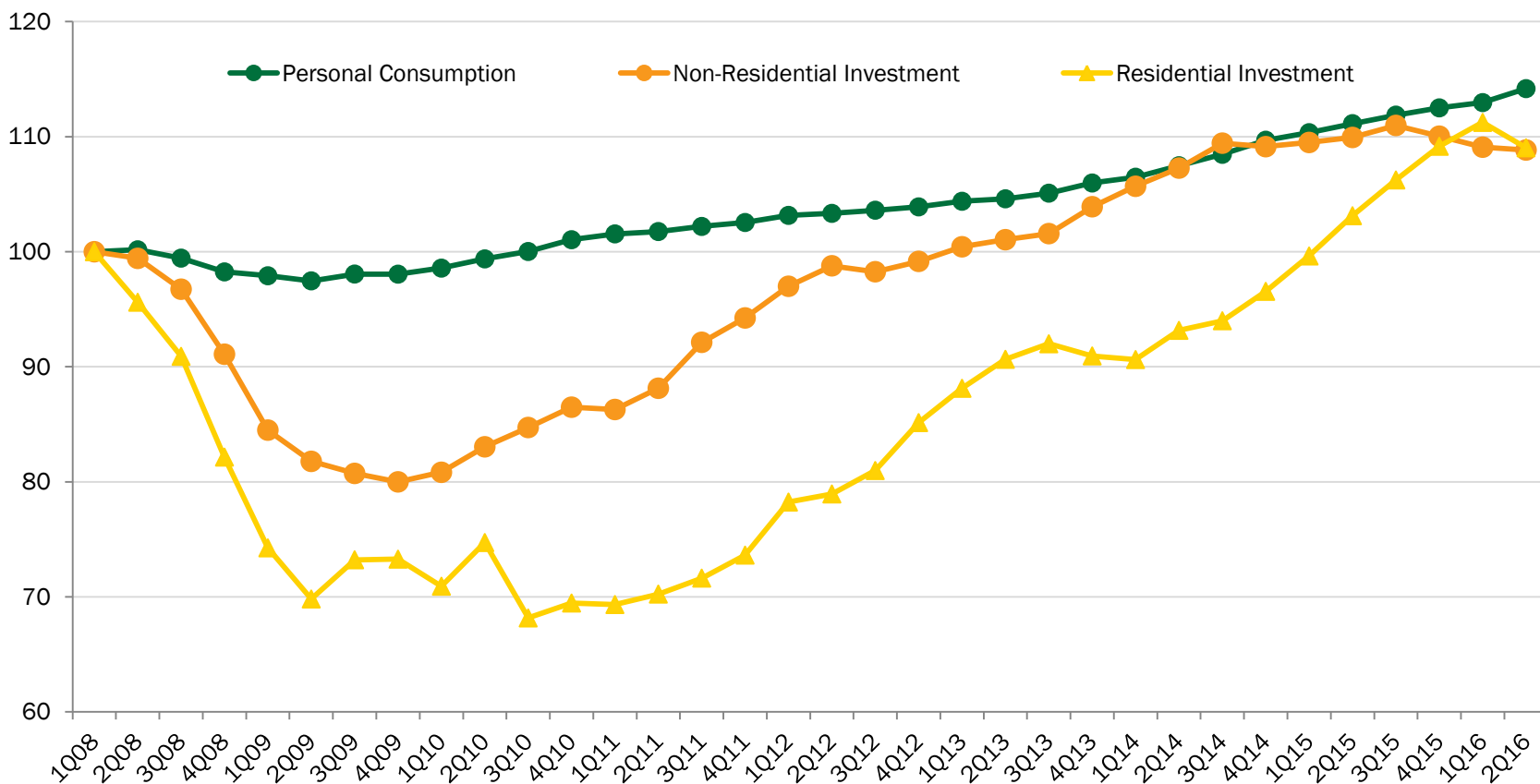
Macroeconomic Arguments Essentially the Same

- Too much saving, too little investing
 - Secular Stagnation (secular)
 - Liquidity Trap (cyclical)
 - Savings Glut (developing world)
 - Debt Overhang (saving for the future)
- Interest rates too low, not stimulating investment
 - Rational expectations suppress investment
 - Monetary policy no longer effective
- Are savings and Investing really too low?

Aggregate Demand Has Been Restored

The Great Recession Decline in Consumption vs. Investment

(Indexed to Q1 2008)



Secular Stagnation Not Supported by the Data

	Average Private Investment Share of Gross GDP	Average Percent Increase in Real GDP ¹
Year	Share	Growth
1950 – 1960	16.4%	3.2%
1960 – 1970	16.5%	4.5%
1970 – 1980	17.9%	3.4%
1980 – 1990	18.5%	3.2%
1990 – 2000	17.3%	3.4%
2000 – 2010	17.8%	1.7%
2010 – 2015	15.6%	2.0%

Source: Federal Reserve Bank of St. Louis.

1) Real GDP growth calculated by annualizing quarter over sequential quarter growth.

Liquidity Trap Not Supported by the Data

	Average Personal Consumption Share of Gross GDP	Average Percent Increase in Real GDP ¹
Year	Share	Growth
1950 – 1960	60.8%	3.2%
1960 – 1970	59.8%	4.5%
1970 – 1980	60.5%	3.4%
1980 – 1990	62.5%	3.2%
1990 – 2000	64.7%	3.4%
2000 – 2010	67.3%	1.7%
2010 – 2015	68.3%	2.0%

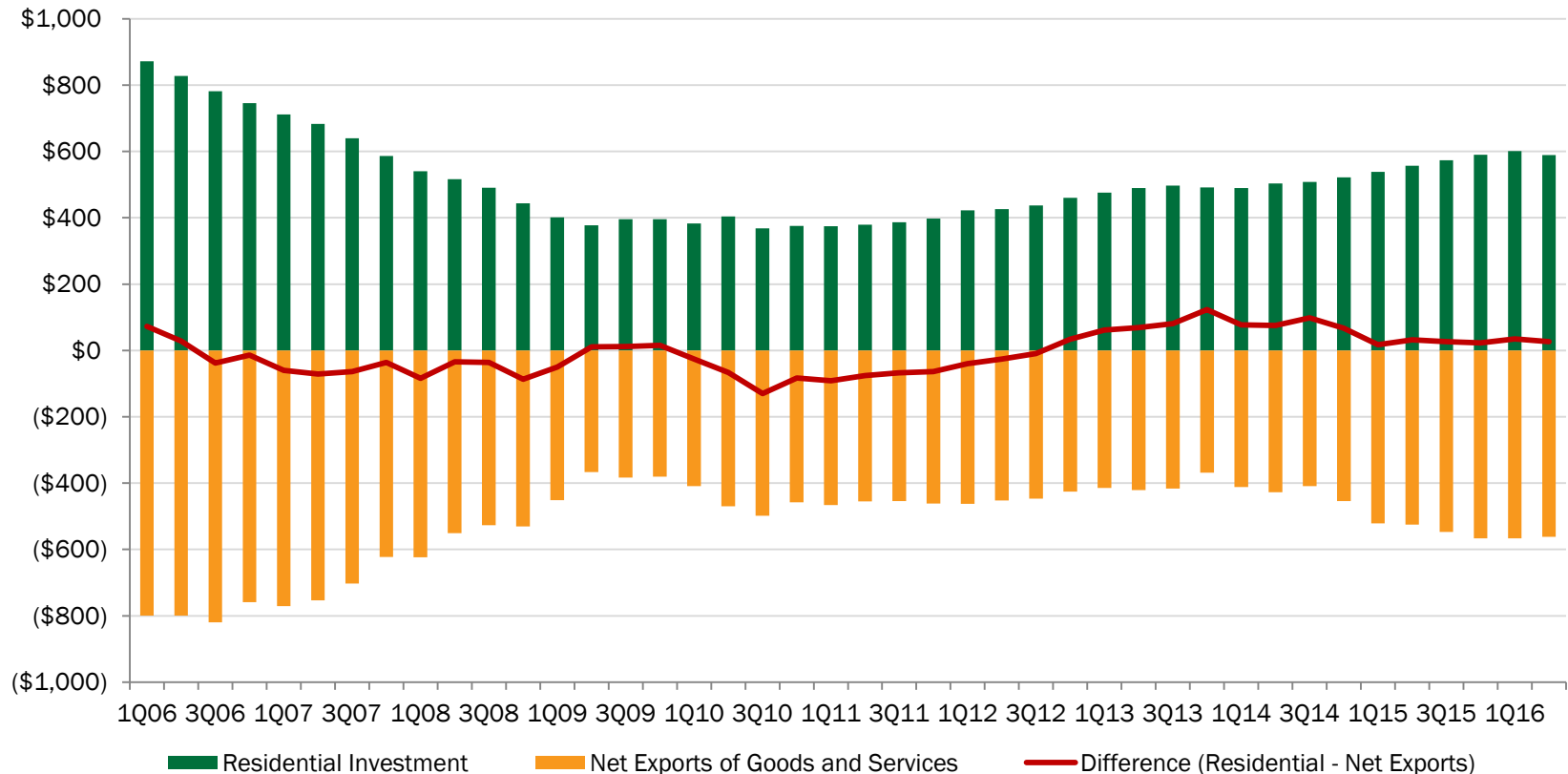
Source: Federal Reserve Bank of St. Louis.

1) Real GDP growth calculated by annualizing quarter over sequential quarter growth.

Global Savings Glut Financed U.S. Housing- Not Productive Investments

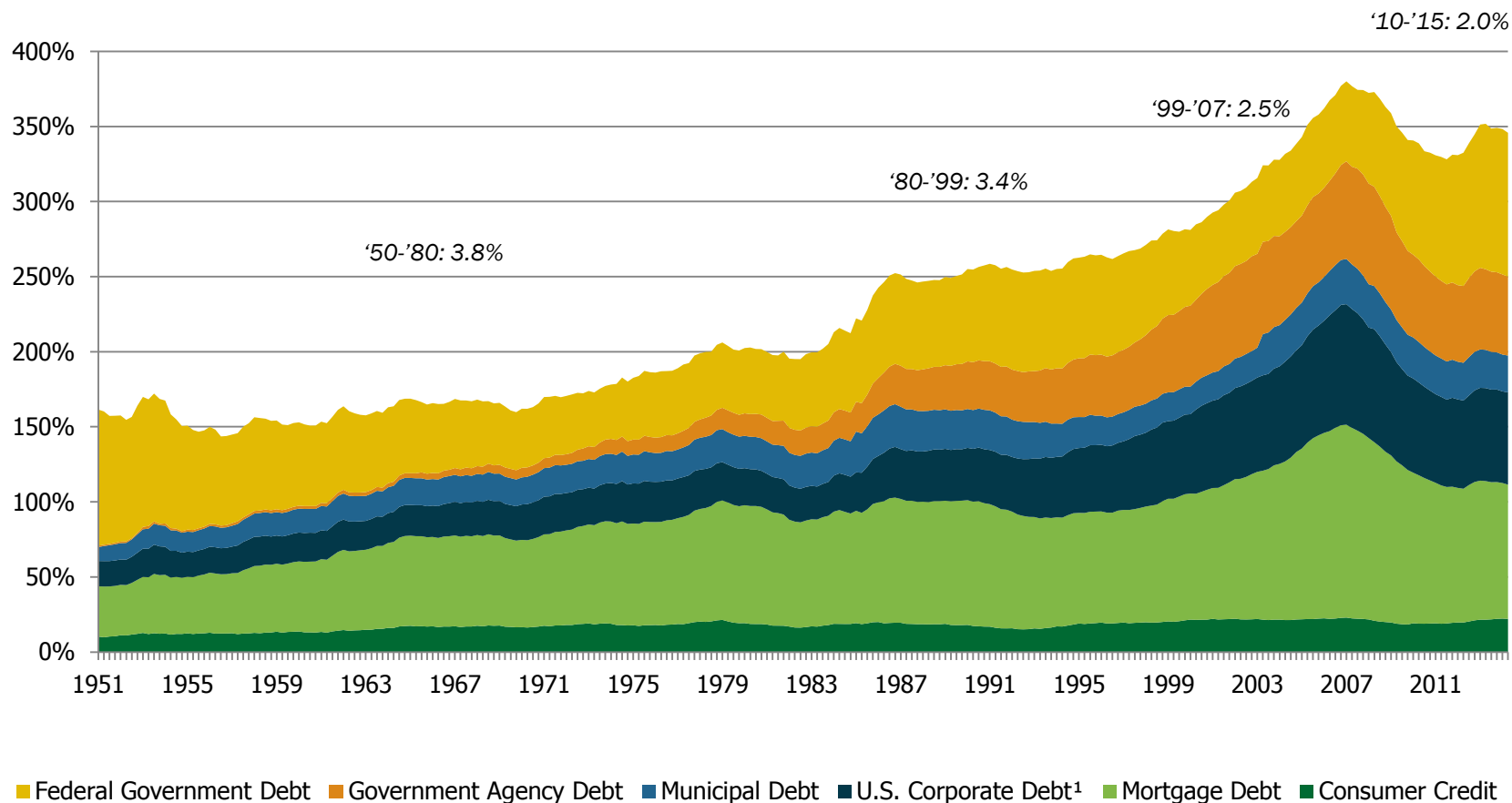
Net Exports vs. Residential Investment

(\$ billions)



Aggregate Debt and Growth Negatively Correlated

Selected Credit Classes as a Percent of Gross GDP



Source: Federal Reserve Board and Federal Reserve Bank of St. Louis.

Note: Italicized numbers indicate compounded real GDP growth during the period.

1) Excludes U.S. held debt of foreign institutions.

First Set of Conclusions:

Conventional Economic Arguments Miss the Point

- Stabilization theories not suited to growth questions
- Hard to see “too little investment” in the numbers
- Easy to see “too much consumption” in the numbers
- Nothing fundamentally wrong from a savings / investment perspective
- Some elements of the monetarists’ arguments seem valid
 - Fundamentally a stabilization argument framed by long term expectations
- Importance of distinguishing productive from unproductive investments

Productivity and Labor

Primer on Growth Economics

- Actual GDP reflects the economy's ability to convert capital and labor into products and services
- Potential GDP reflects the quantity and quality of capital and labor available to produce goods and services
- Growth reflects success in converting potential in actual GDP over time

Why Aren't We Growing? – Growth View



End of Productivity?
Robert Gordon



Demographics
Ruchir Sharma

August 9, 2016

The Wall Street Journal

Productivity Slump Threatens Economy's Long-Term Growth

BY BEN LEUBSDORF

The longest slide in worker productivity since the late 1970s is haunting the U.S. economy's long-term prospects, a force that could prompt Federal Reserve officials to keep interest rates low for years to come.

Productivity: The Focus of Economists

 *Productivity growth is the key determinant of improvements in living standards, supporting higher pay for workers without increased costs for employers. Recent weak productivity growth likely helps account for the disappointing pace of wage gains during this economic expansion.* 

-Janet Yellen

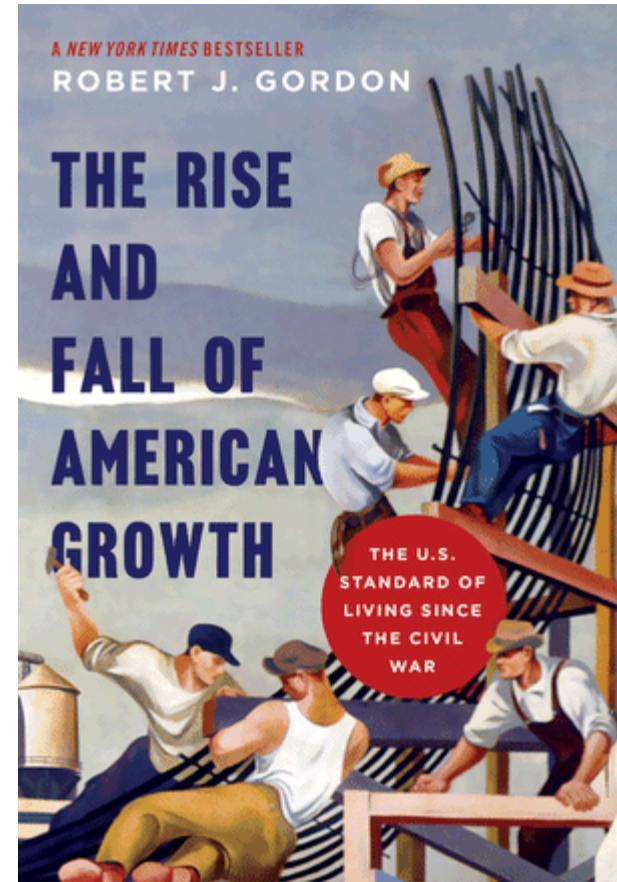
Income Inequality: The Focus of Politicians

“Despite huge advancements in technology and productivity, millions of Americans are working longer hours for lower wages. The real median income of male workers is \$783 less than it was 42 years ago.”

- Bernie Sanders

The Rise and Fall of American Growth, by Robert Gordon

- In the “special century” from 1870 – 1970, living standards increased more rapidly than at any time before or after
- Substantial slowdown in productivity growth since the end of the “special century”
- Pace of innovation has slowed since 1970, and gains in technological improvement have been shared less broadly
- Innovations of today contribute less to improvements in living standards
- Future is unlikely to bring anything approaching the economic gains of the earlier period



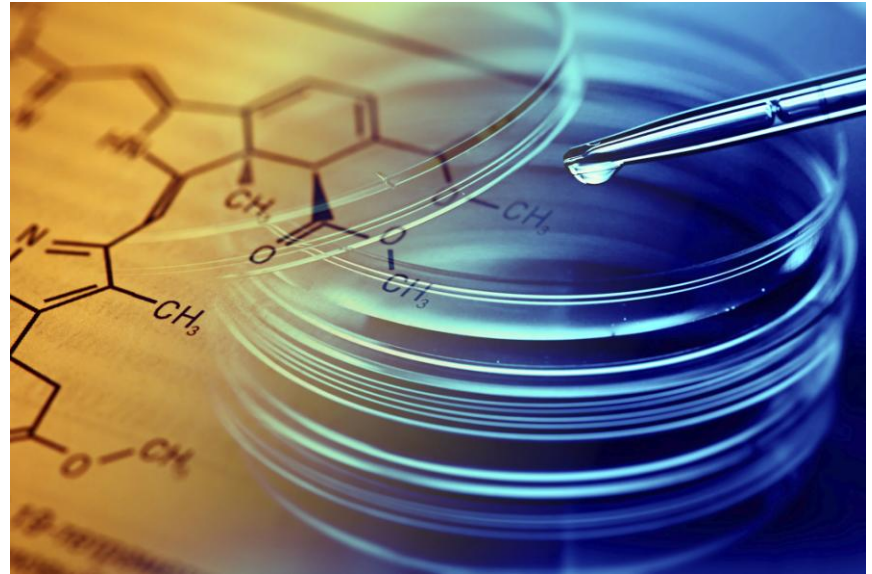
“Special Century” Characterized by “Only Once” Achievements

- Manual outdoor jobs replaced to air-conditioned environments
- Electric appliances
- Advances in light
- Phonographs
- Travel
- Television and other media



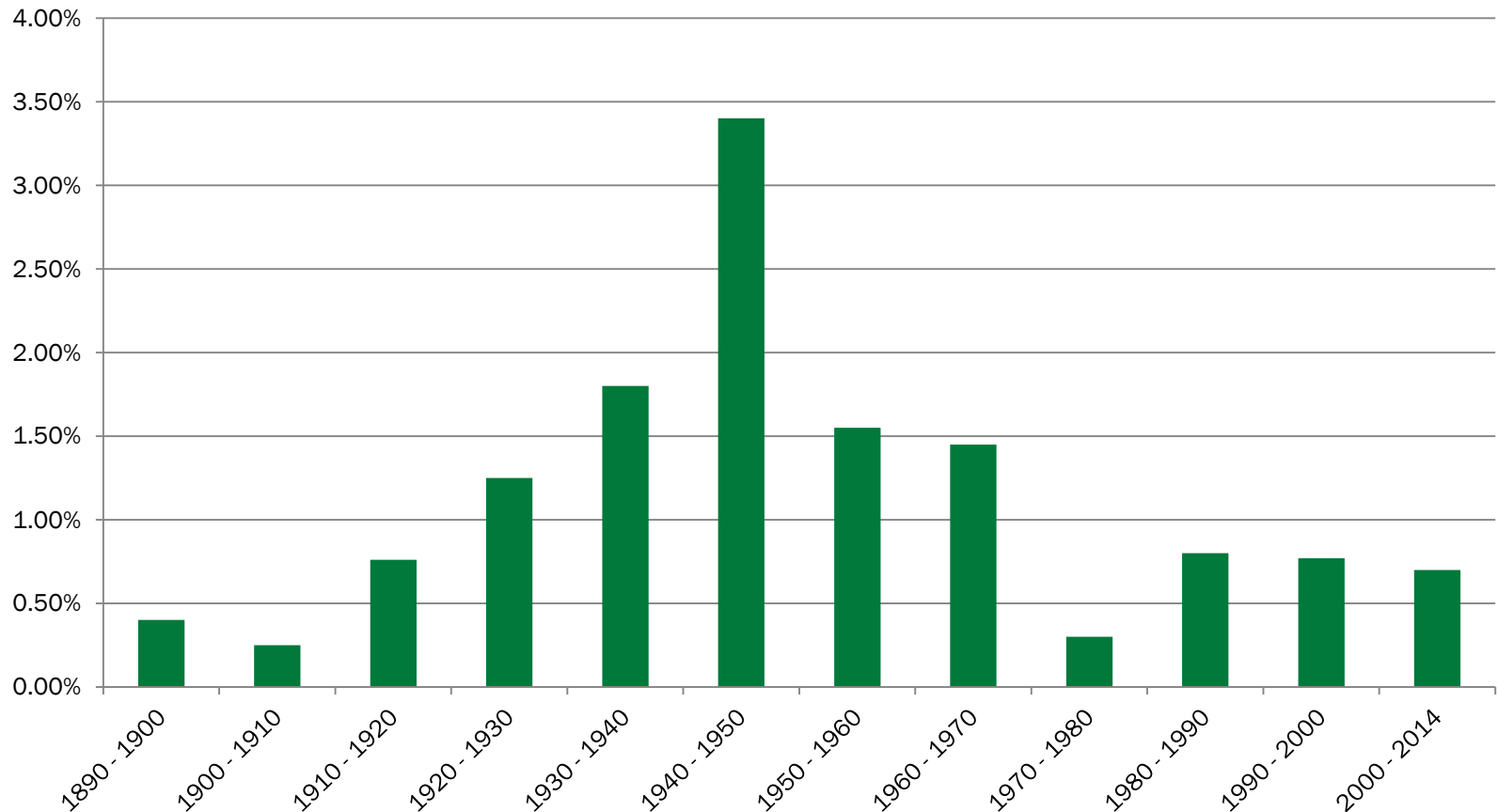
“Special Century” Rebuttals

- Internet
- Machine Learning
- Personalized Medicine
- Genetics
- Space Travel
- Pine Brook



Gordon's Point: We Will Not See This Growth Going Forward

Total Factor Productivity Annual Growth by Decade



Source: Gordon, Robert J. *The Rise and Fall of American Growth*.
Note: Figures are average annual growth rates over the period.

“Pine Brooking™” the Question

Gordon's Total Factor Productivity ("TFP")

- Traditional measure of the pace of innovation and technological change— output divided by a weighted average of labor and capital input
- Total factor productivity is the geometrically weighted average of the ratio of real GDP to labor input and the ratio of real GDP to capital input, with respective weights of 0.7 and 0.3
- Labor input consists of hours multiplied by an index of labor quality, taken from the “educational productivity index” of Goldin-Katz
- Capital input consists of a new capital series developed by Gordon which includes an adjustment for government capital (roads, highways and other infrastructure) that adds to productivity in the private sector

Goldin-Katz “Educational Productivity Index”

- Measures the contribution of educational upgrading to aggregate labor input growth
- Measures the productivity of workers with different education levels by computing the relative wage of each education group, adjusted for differences in potential experience, sex, race, and nativity
- $E_t = \hat{O}_i w_{ij} S_{it}$
 - w_{ij} is the (adjusted) wage of education group i (relative to a reference education group) in base period J
 - S_{it} is the share of education group i in employment (or total hours) in year t
- The impact of educational expansion on economic growth is the log change in the index times labor's share of national product (which has remained at about 0.7 across the twentieth century)

Table 1
Education's Role in Economic Growth, 1915-1999: Iowa and the United States
(100 H Annual Log Change in Labor Force Educational Productivity Index)

Time period	United States		Iowa	
	Employment	Hours	Employment	Hours
Chain Weighted Prices				
1915-1940 ^a	0.55	n.a.	0.55	n.a.
1940-1960	0.51	0.50	0.39	0.39
1960-1980	0.63	0.64	0.55	0.58
1980-1999	0.43	0.43	0.39	0.39
1915-1999 ^b	0.53	n.a.	0.47	n.a.
Fixed Weight Prices				
1915-1940 ^a	0.47	n.a.	0.47	n.a.
1940-1960	0.54	0.54	0.44	0.45
1960-1980	0.75	0.76	0.68	0.71
1980-1999	0.44	0.44	0.41	0.39
1915-1999	0.55	n.a.	0.50	n.a.

^a U.S. figure is equal to that for Iowa, by assumption.

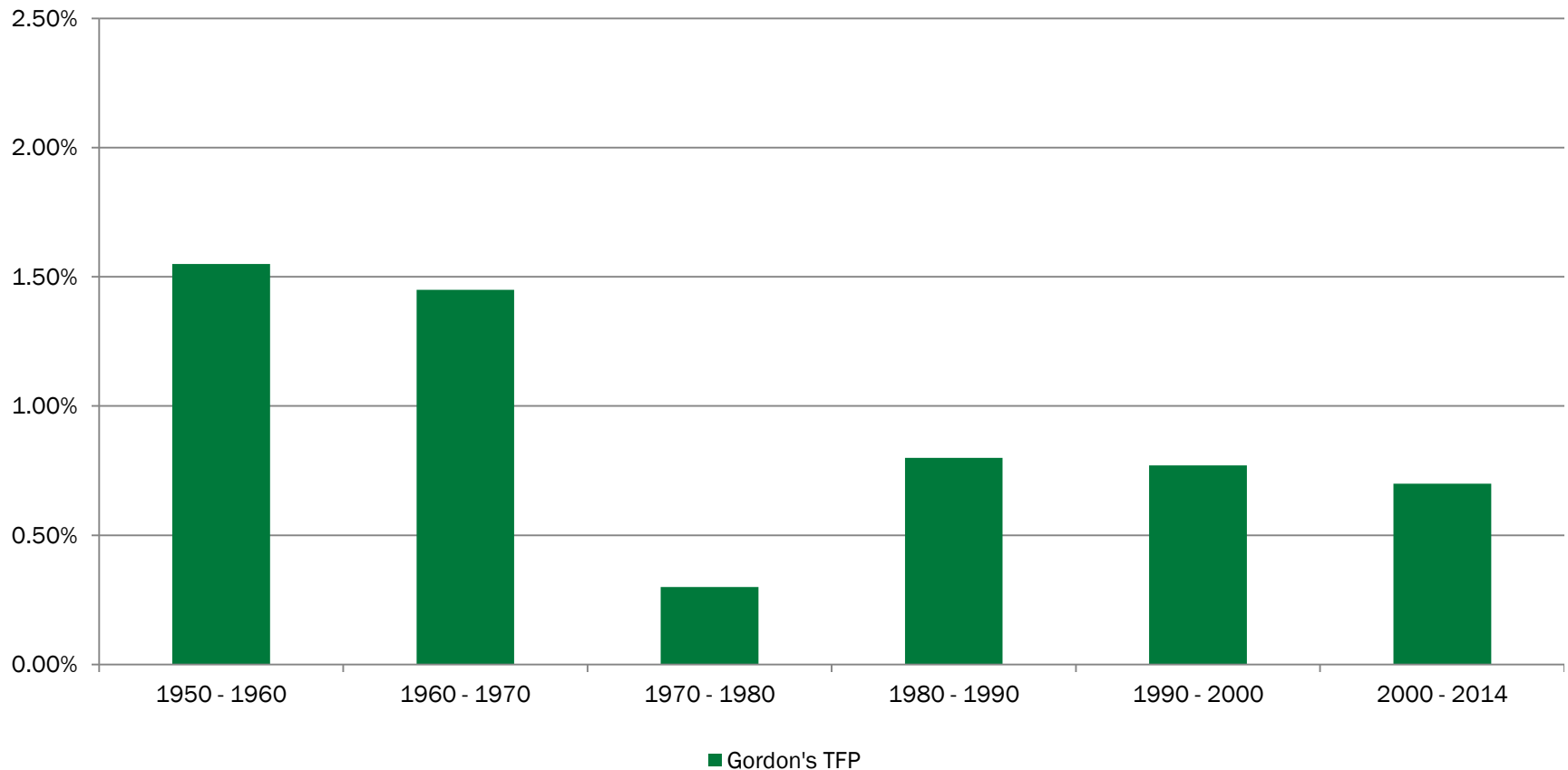
^b The average of the growth rates in the intermediate periods weighted by the interval length.

Bureau of Labor Statistics Multifactor Productivity ("MFP")

- Measures the value-added output per combined unit of labor and capital input in private business and private nonfarm business
- Output, consisting of only goods and services sold to final consumers, is measured net of price changes and inter-industry transactions and the input measure is an aggregate of labor input and capital service flows. These measures have been developed in recognition of the role capital growth plays in output growth
- Labor input is obtained by Tornqvist aggregation of the hours at work by all persons, classified by education, work experience, and gender with weights determined by their shares of labor compensation
- Capital inputs are computed in accordance with a service flow concept for physical capital assets—equipment, structures, inventories, and land
- Excludes intermediate inputs, intersector transactions and intermediate imports

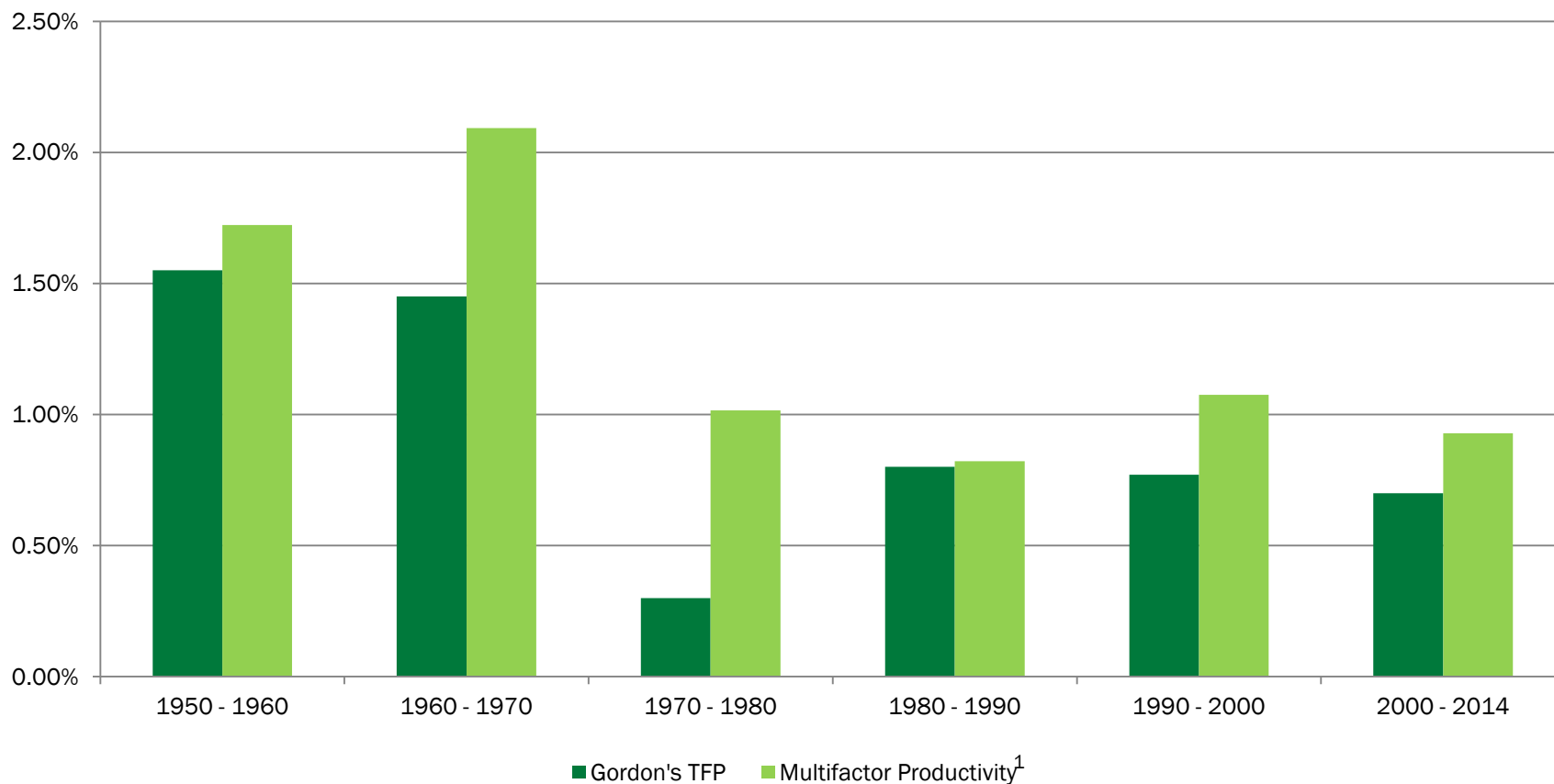
Productivity Growth Is Not as Bad as Gordon Indicates

Annual Productivity Growth Comparison by Decade



Productivity Growth Is Not as Bad as Gordon Indicates

Annual Productivity Growth Comparison by Decade



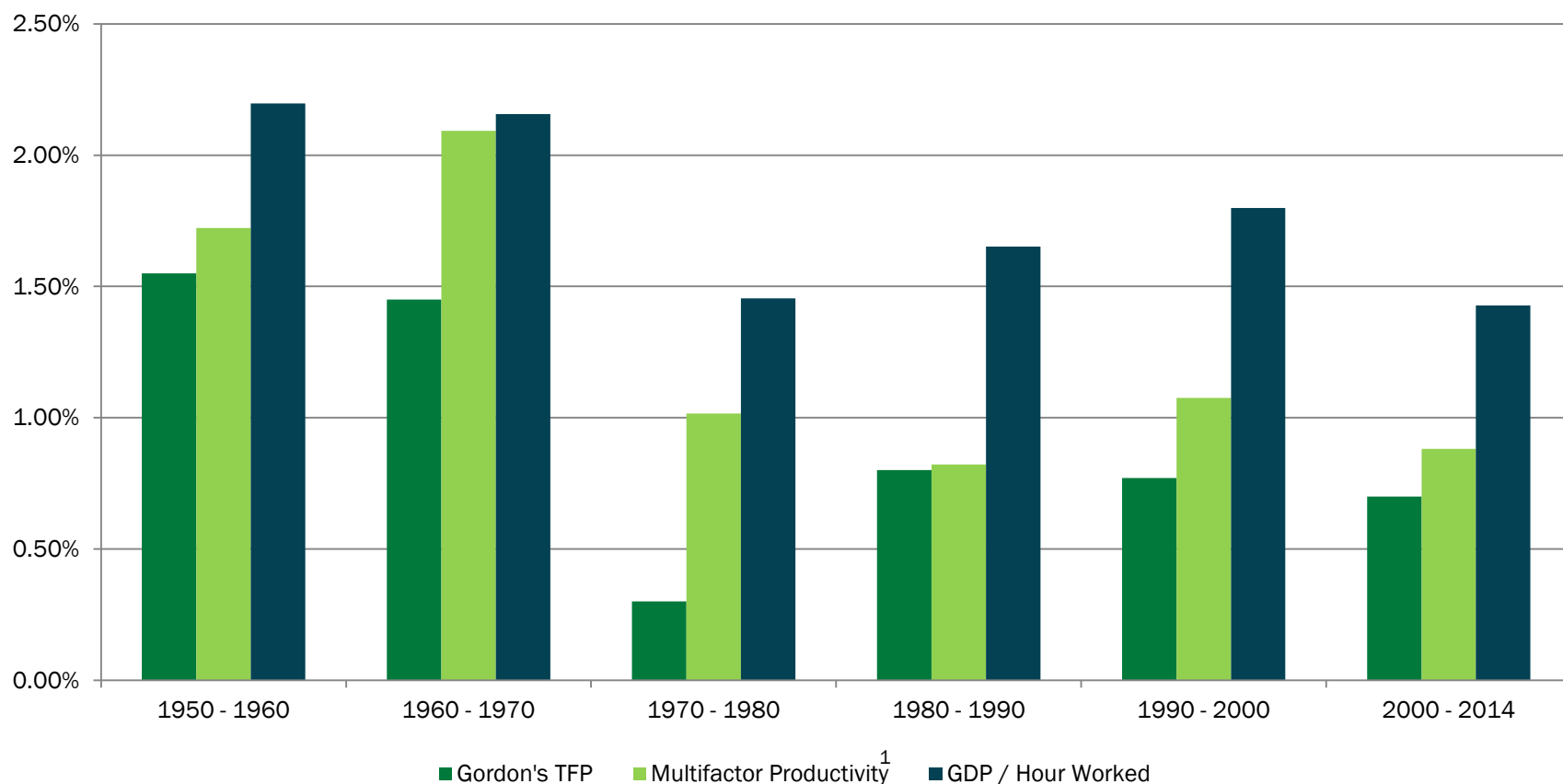
Source: Gordon, Robert J. *The Rise and Fall of American Growth* and Bureau of Labor Statistics.

Note: Figures are average annual growth rates over the period.

1) Multifactor productivity (MFP), is a measure of economic performance that compares the amount of goods and services produced (output) to the amount of combined inputs used to produce those goods and services. Inputs can include labor, capital, energy, materials, and purchased services.

Productivity Growth Is Not as Bad as Gordon Indicates

Annual Productivity Growth Comparison by Decade



Source: Gordon, Robert J. *The Rise and Fall of American Growth*, Bureau of Labor Statistics, Bureau of Economic Analysis and Federal Reserve Bank of St. Louis.

Note: Figures are average annual growth rates over the period.

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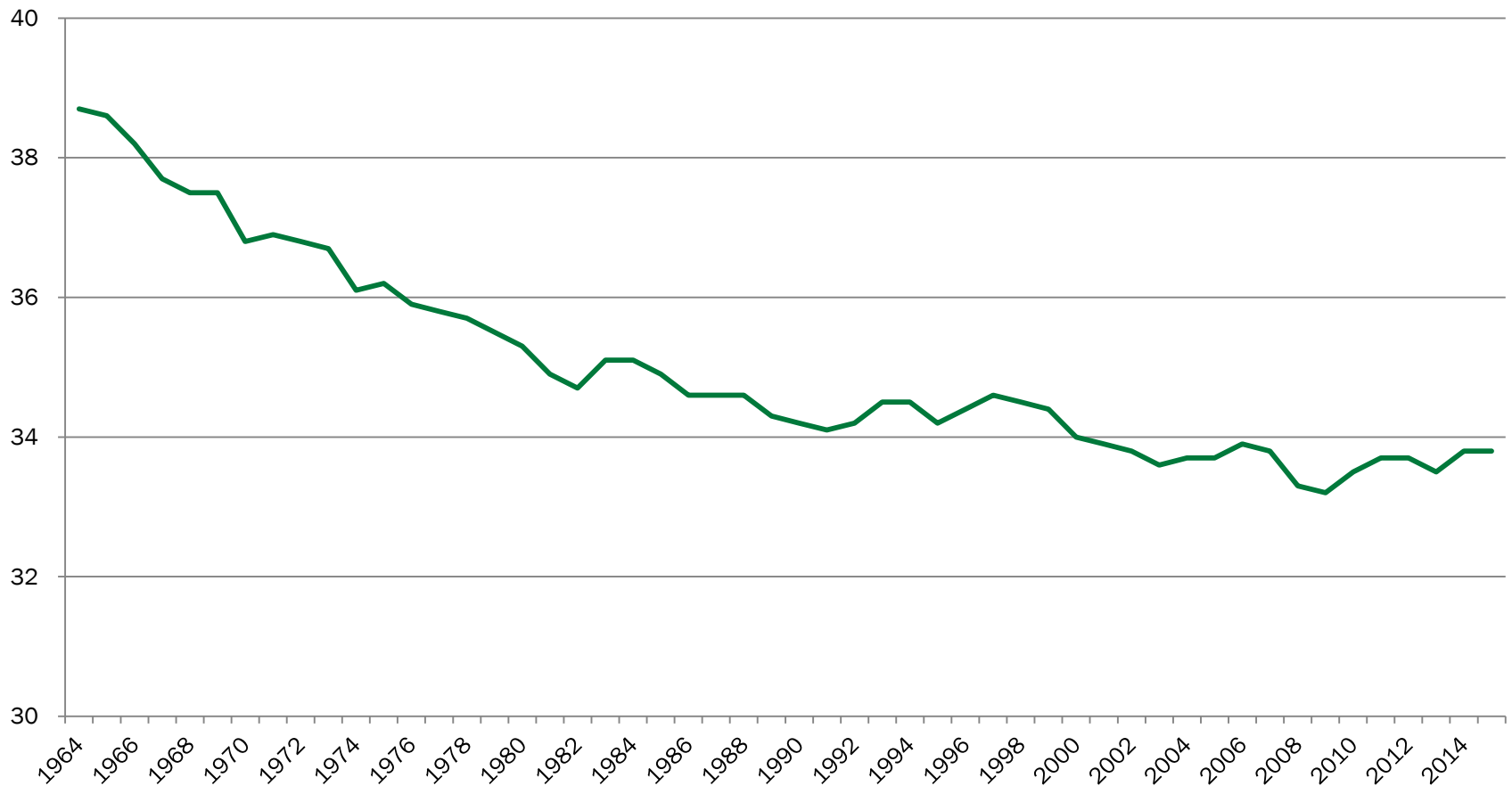
Labor Productivity Compared to Worker Productivity

Annual Labor Productivity Growth by Decade



First Benefit of Productivity: More Leisure Time

Weekly Hours Worked by Production and Nonsupervisory Private Employees



Productivity Is Being Spent on Imports

	Average Net Imports Share of Gross GDP	Average Percent Increase in Real GDP ¹
Year	Share	Growth
1950 – 1960	(0.3)%	3.2%
1960 – 1970	(0.6)%	4.5%
1970 – 1980	0.2%	3.4%
1980 – 1990	1.7%	3.2%
1990 – 2000	1.2%	3.4%
2000 – 2010	4.4%	1.7%
2010 – 2015	3.2%	2.0%

Source: Federal Reserve Bank of St. Louis.

1) Real GDP growth calculated by annualizing quarter over sequential quarter growth.

Another View at the Productivity Issue

Category	2000 - 2015				
	Jobs (000s)		GDP (\$ bn)		Ann. Change in Labor Productivity
	Variance	%	Variance	%	%
Less Than 1% Annual Productivity Growth					
Leisure and Hospitality Employment	3,366	28.1%	156	17.1%	(0.6%)
Education Employment	1,062	43.5%	43	34.2%	(0.4%)
Health Services Employment	5,851	44.9%	382	47.9%	0.1%
Other	1,418	4.3%	18	0.5%	(0.2%)
Total	11,697	19.5%	599	11.6%	(0.5%)
1% - 3% Annual Productivity Growth					
Professional and Business Services	3,144	18.7%	620	43.7%	1.3%
Other	913	3.1%	1,486	35.7%	1.9%
Total	4,057	8.7%	2,106	37.7%	1.6%
Greater Than 3% Annual Productivity Growth					
Manufacturing	(4,861)	(28.3%)	308	19.2%	3.4%
Information	(942)	(25.4%)	433	97.5%	6.7%
Total	(5,803)	(27.8%)	741	36.2%	4.3%
Total	9,951	7.8%	3,446	26.9%	1.1%

Source: Pine Brook internal analysis, Bureau of Labor Statistics and Bureau of Economic Analysis.

Note: Change in productivity measured as Real GDP per Worker on a point-to-point in time basis.

Jobs Creation Has Taken Place in Low Productivity Industries

	1950 - 1960	1960 - 1970	1970 - 1980	1980 - 1990	1990 - 2000	2000 -2015
Total Change in # of Jobs (000s)	6,577	16,405	19,147	16,753	22,651	9,951
Annualized Change in Labor Productivity	2.6%	1.4%	0.2%	1.3%	1.1%	1.1%

	Share of Job Creation					
Category	1950 - 1960	1960 - 1970	1970 - 1980	1980 - 1990	1990 - 2000	2000 -2015
Less Than 1% Annual Productivity Growth	23.5%	51.2%	64.7%	68.4%	83.3%	117.5%
1% - 3% Annual Productivity Growth	54.0%	28.0%	27.3%	37.3%	5.5%	40.8%
Greater Than 3% Annual Productivity Growth	22.5%	20.8%	8.0%	(5.7%)	11.3%	(58.3%)
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Pine Brook internal analysis, Bureau of Labor Statistics and Bureau of Economic Analysis.
 Note: Change in productivity measured as Real GDP per Worker on a point-to-point in time basis.

50 Shades of Productivity

Category	Annualized Change in Labor Productivity						1950 - 2015
	1950 - 1960	1960 - 1970	1970 - 1980	1980 - 1990	1990 - 2000	2000 - 2015	
Leisure and hospitality	(0.6%)	(0.7%)	0.0%	0.1%	0.8%	(0.6%)	(0.2%)
Construction	3.1%	0.3%	(1.5%)	0.7%	(1.1%)	(1.2%)	(0.1%)
Government	1.1%	(0.3%)	(1.4%)	0.9%	(0.4%)	0.2%	0.0%
Educational and health services	6.8%	1.8%	(0.4%)	(1.8%)	(1.3%)	0.1%	0.8%
Retail trade	0.6%	0.0%	(0.8%)	1.5%	3.6%	1.2%	1.0%
Transportation, warehousing, utilities	4.5%	2.8%	0.6%	0.6%	0.6%	(0.4%)	1.3%
Professional and business services	3.1%	2.4%	1.0%	2.0%	(1.2%)	1.3%	1.4%
Financials	2.0%	1.8%	1.5%	0.2%	1.9%	1.8%	1.6%
Mining and logging	4.3%	2.0%	(8.2%)	6.9%	3.7%	2.0%	1.7%
Manufacturing	2.3%	3.4%	1.6%	4.1%	4.5%	3.4%	3.2%
Wholesale trade	2.7%	3.0%	3.7%	3.9%	5.3%	1.8%	3.3%
Information	8.3%	4.7%	5.1%	2.0%	0.8%	6.7%	4.7%
Total	2.6%	1.4%	0.2%	1.3%	1.1%	1.1%	1.3%

High Productivity



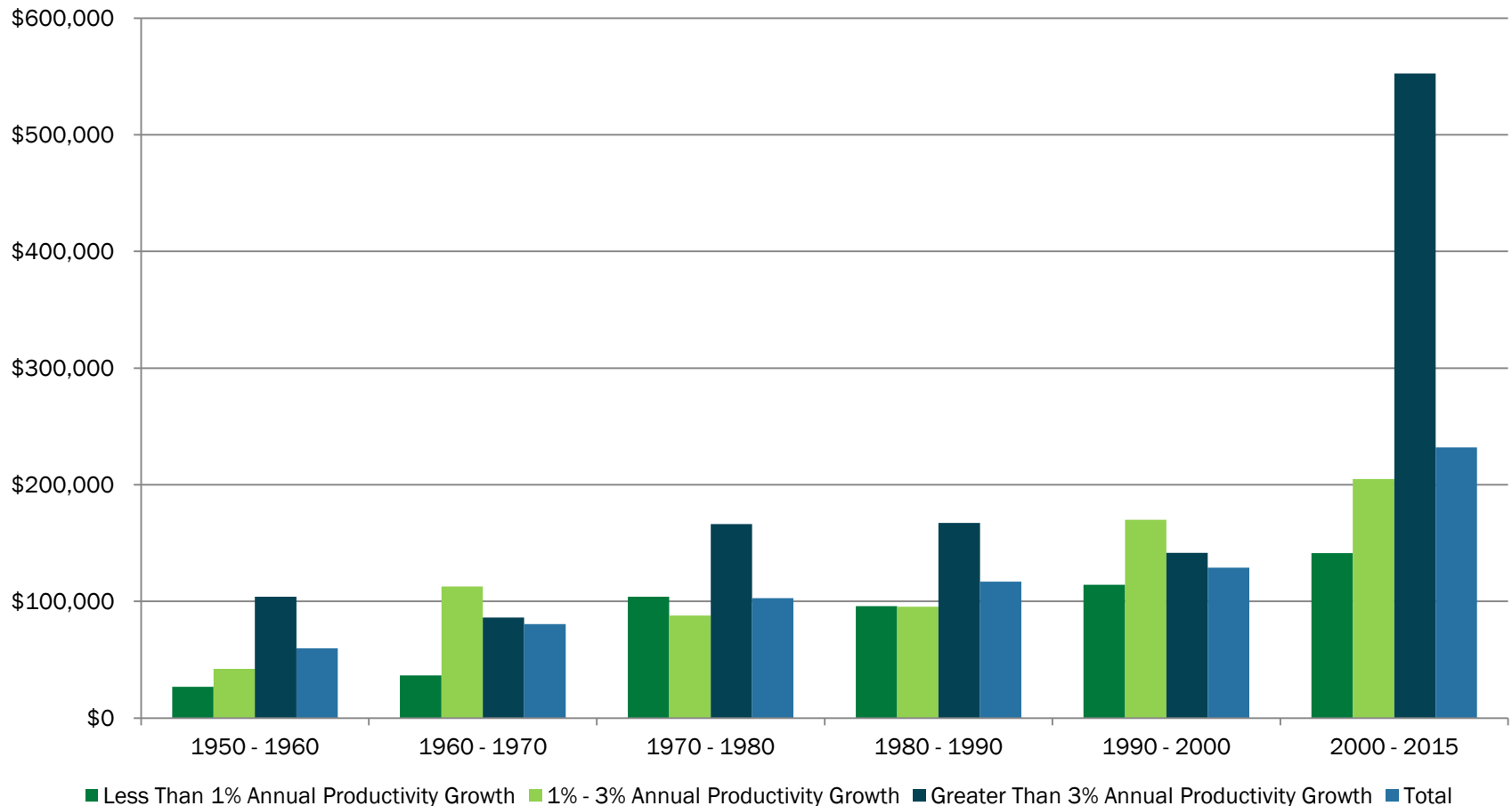
Low Productivity

Source: Pine Brook internal analysis, Bureau of Labor Statistics and Bureau of Economic Analysis.

Note: Change in productivity measured as Real GDP per Worker on a point-to-point in time basis.

If People Are Given More Tools, They Will Be More Productive

Aggregate Real Private Investment in Fixed Assets (\$) per Average Worker¹

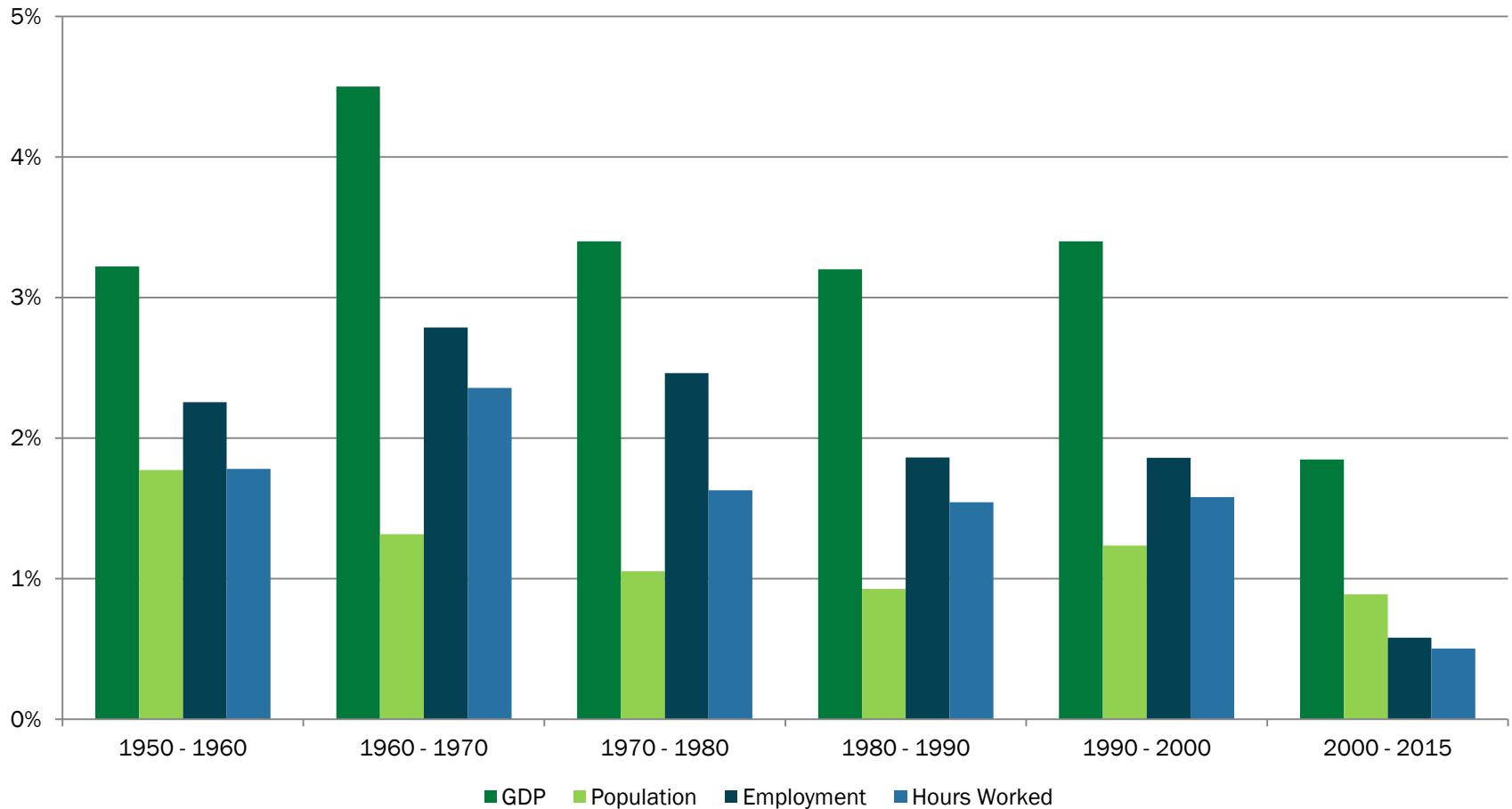


Source: Pine Brook internal analysis, St. Louis Federal Reserve, Bureau of Labor Statistics and Bureau of Economic Analysis. 2009 chained dollars.

1) Excludes Government and Real Estate, Rental and Leasing from analysis.

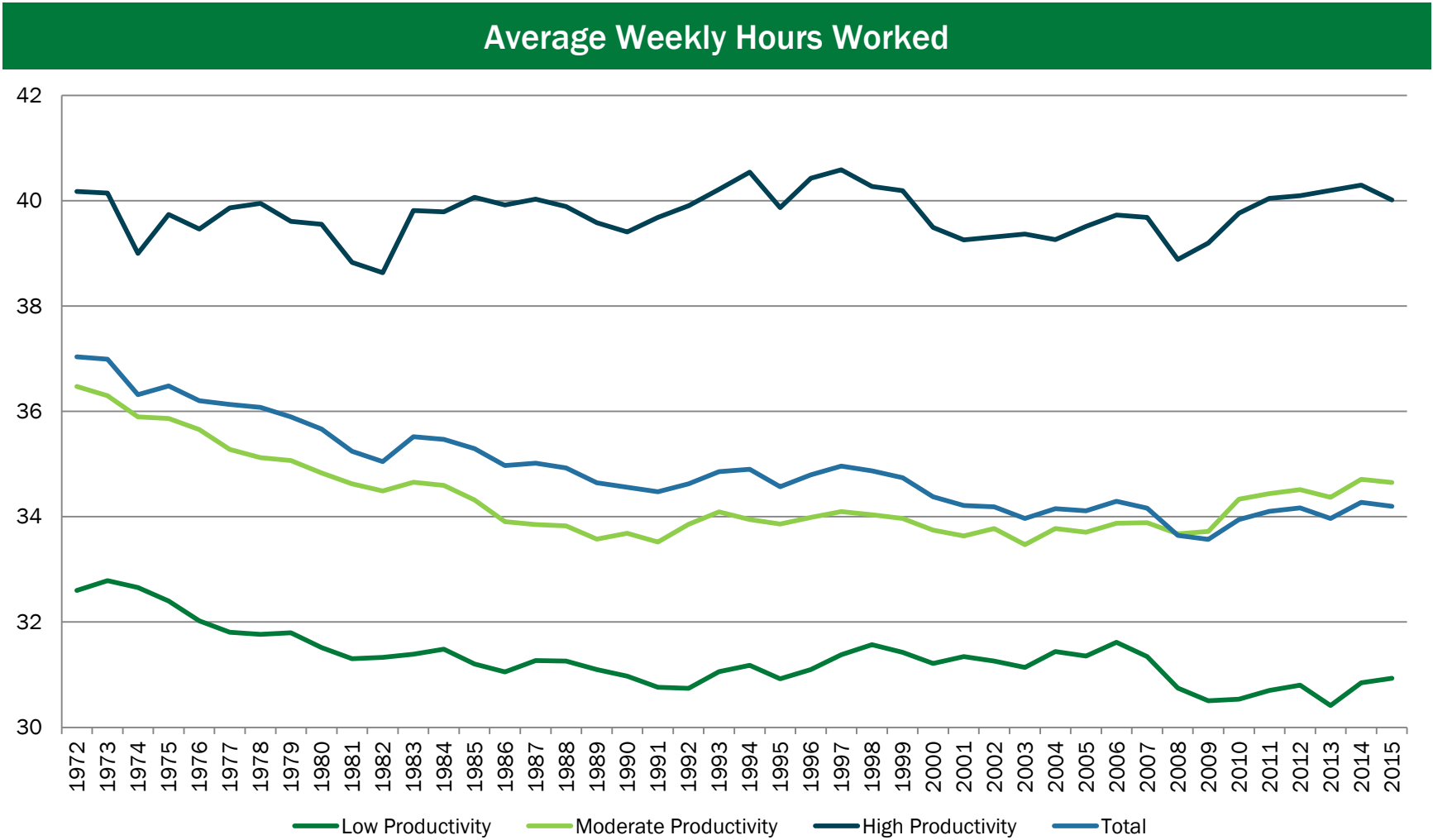
GDP Growth Is Correlated with Labor Input

United States Average Annual Growth Rates by Decade



Source: Federal Reserve Bank of St. Louis and Bureau of Labor Statistics. 2009 chained dollars.
Note: Figures are average annual growth rates over the period.

Average Weekly Hours vs. Productivity



Source: Federal Reserve Bank of St. Louis, Bureau of Labor Statistics and Department of Commerce.
Note: Excludes Government.

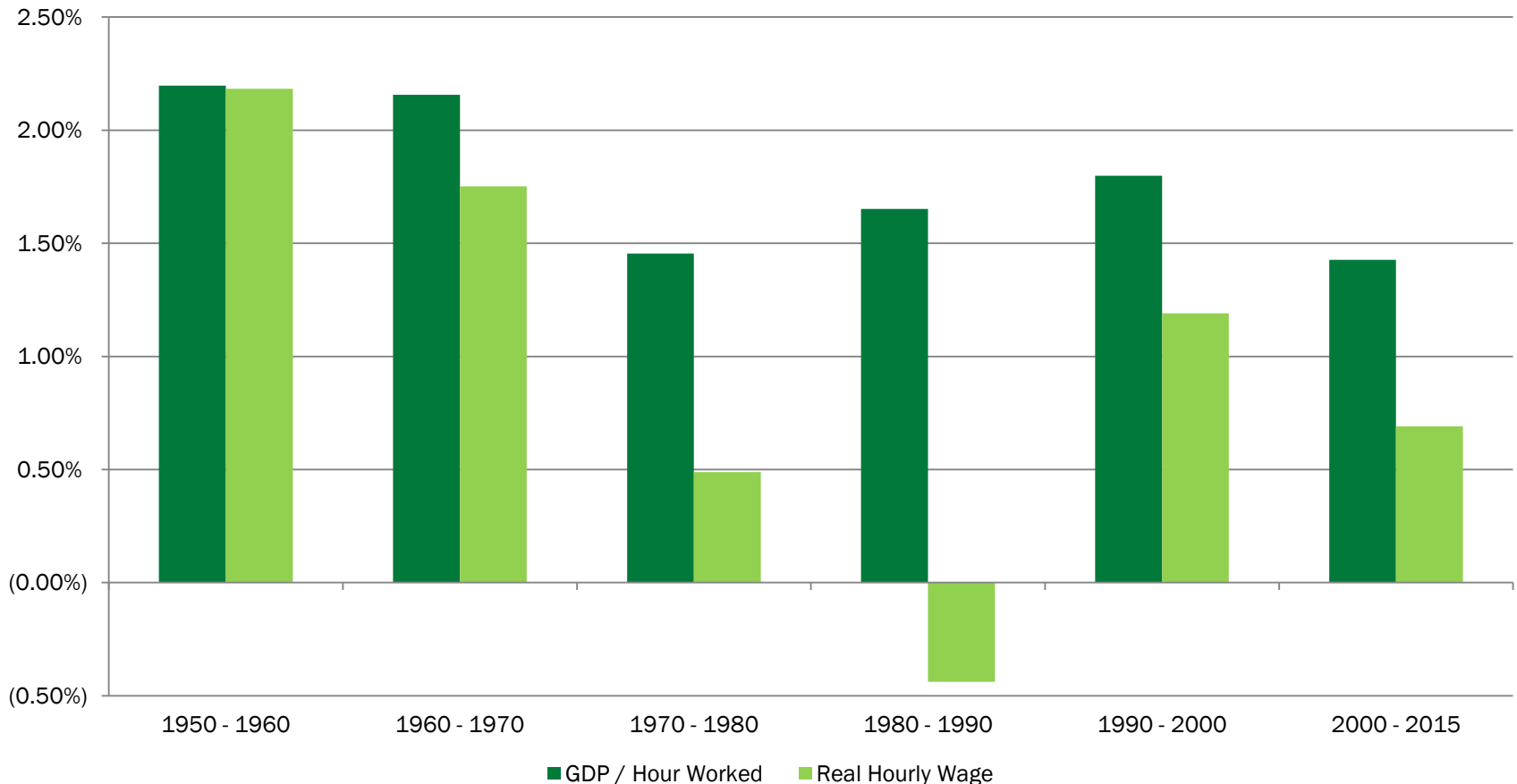
Second Set of Conclusions

- Productivity results from capital expenditures
- Some industries attract more capital than others
- Low productivity industries are becoming more important in the U.S.
- Part of the productivity puzzle is why the industries with high growth in employment don't attract more capital
 - No incentive to become efficient
 - Impossible to automate
 - Higher returns on capital elsewhere
- Productivity can be consumed in leisure or imports instead of adding to GDP
- Slower population growth implies lower GDP growth

Profitability and Income Distribution

Wage Growth Follows Productivity Growth... Sometimes

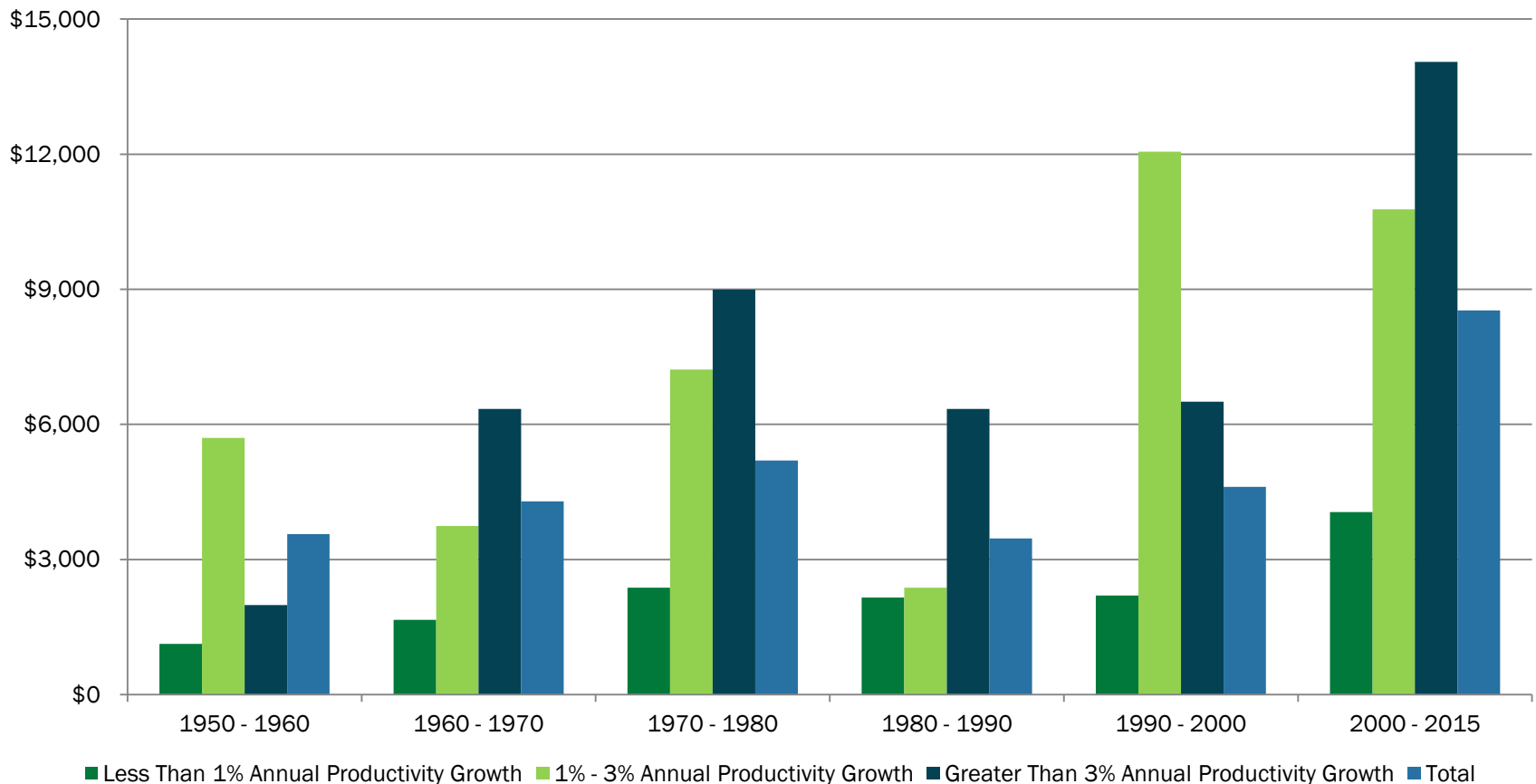
Annual Labor Productivity Growth vs. Wage Growth by Decade



Source: Bureau of Economic Analysis and Federal Reserve Bank of St. Louis. 2009 chained dollars.
Note: Figures are average annual growth rates over the period.

Profitability Per Worker Is Correlated with Productivity

Real Average Annual Corporate Profit / Worker¹

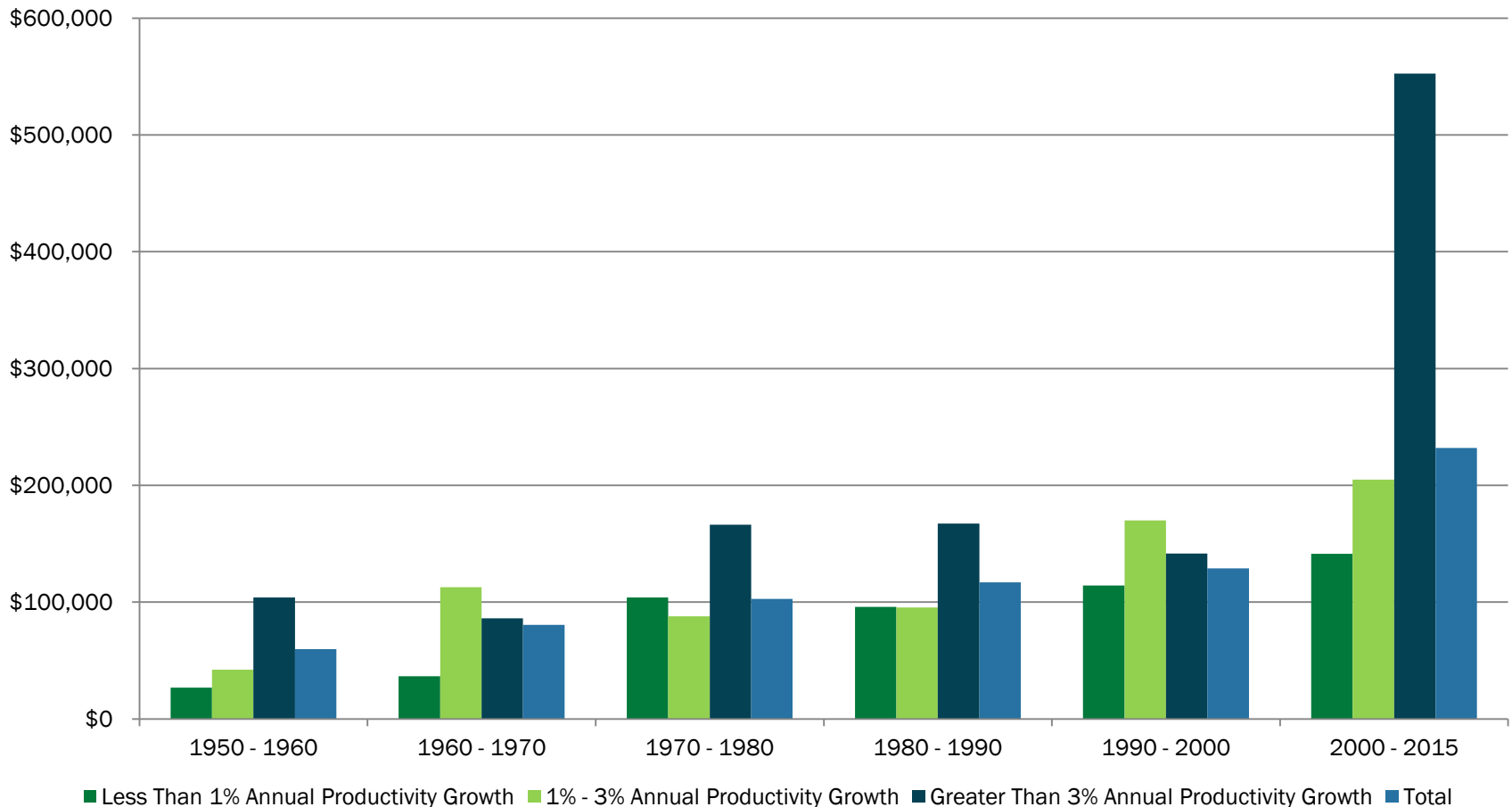


Source: Pine Brook internal analysis, St. Louis Federal Reserve, Bureau of Labor Statistics and Bureau of Economic Analysis. 2009 chained dollars.

1) Excludes Government from analysis.

If People Are Given More Tools, They Will Be More Productive

Aggregate Real Private Investment in Fixed Assets (\$) per Average Worker¹



Source: Pine Brook internal analysis, St. Louis Federal Reserve, Bureau of Labor Statistics and Bureau of Economic Analysis. 2009 chained dollars.

1) Excludes Government and Real Estate, Rental and Leasing from analysis.

Increase in Profitability Not the Culprit

Real Average Annual Corporate Profits / Net Capital Stock of Private Fixed Assets ¹						
	1950 – 1960	1960 – 1970	1970 – 1980	1980 – 1990	1990 – 2000	2000 – 2015
Total	8.8%	7.8%	8.9%	5.2%	5.9%	8.3%

Source: Pine Brook internal analysis, St. Louis Federal Reserve, Bureau of Labor Statistics and Bureau of Economic Analysis. 2009 chained dollars.

1) Excludes Real Estate, Rental and Leasing and Government from analysis.

Wages Reflect Productivity

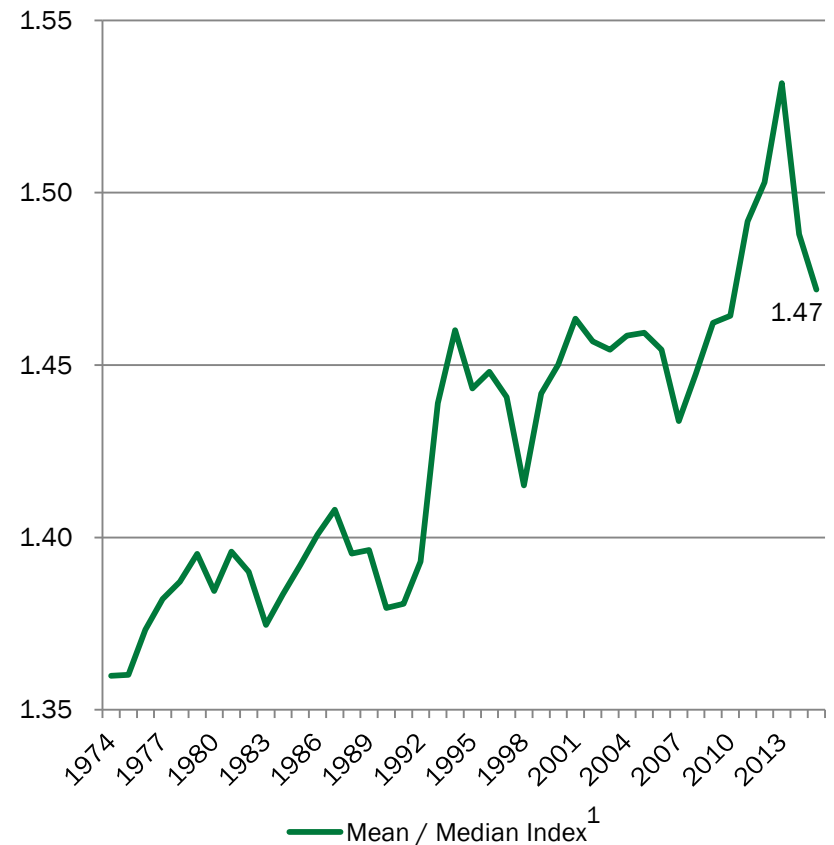
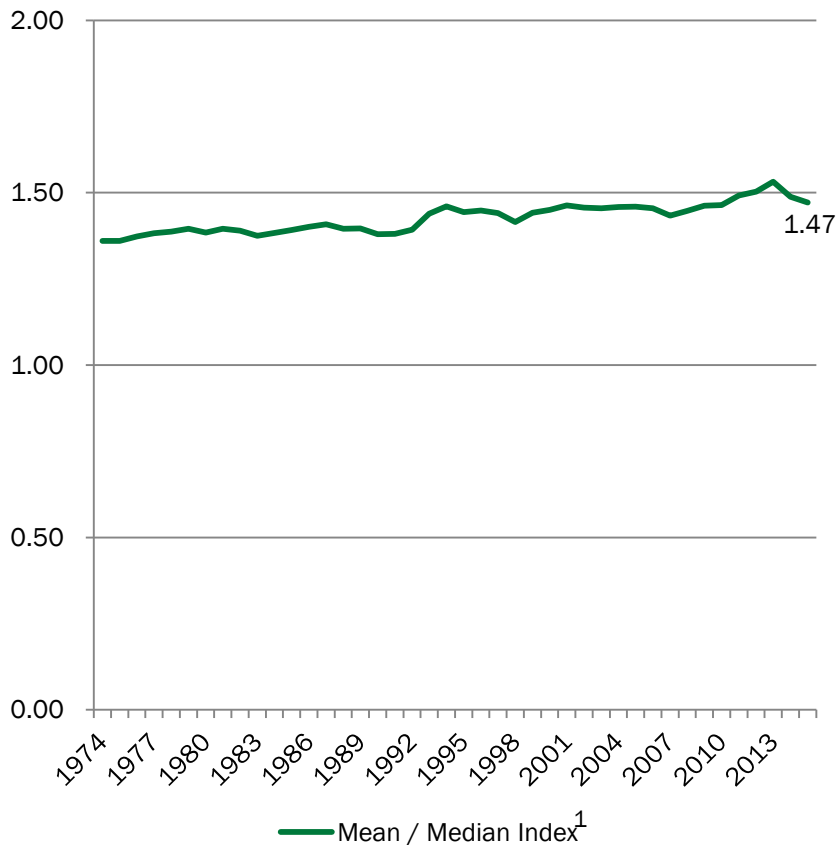
	Years 2000 – 2015	
	Real Average Hourly Wage for Nonsupervisory Workers	Real Average Wages per All FTE
<1% Annual Productivity Growth ¹	\$17.16	\$41,319
1% - 3% Annual Productivity Growth	\$18.64	\$55,231
>3% Annual Productivity Growth	\$19.45	\$61,309
Total	\$18.38	\$49,955

Source: Pine Brook internal analysis, St. Louis Federal Reserve, Bureau of Labor Statistics and Bureau of Economic Analysis. 2009 chained dollars.

1) Excludes Government from analysis.

Real Personal Income Inequality a Matter of Perspective

Real Personal Income in the United States (Mean vs. Median)

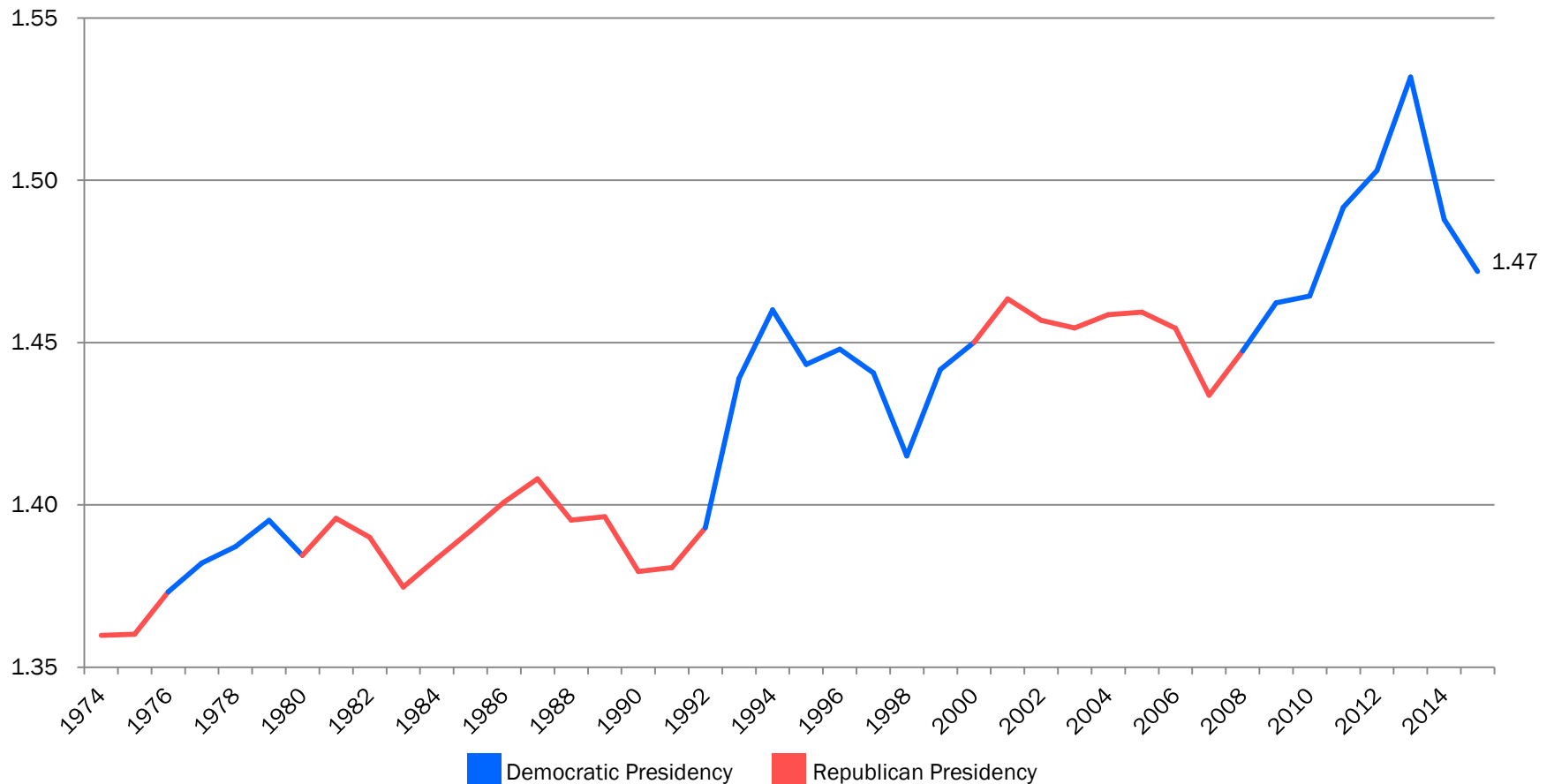


Source: Federal Reserve Bank of St. Louis.

1) Real Mean Personal Income in the United States / Real Median Personal Income in the United States.

Sometimes Correlation Is Not Causation

Real Personal Income in the United States (Mean vs. Median)¹



Source: Federal Reserve Bank of St. Louis.

1) Real Mean Personal Income in the United States / Real Median Personal Income in the United States.

Third Set of Conclusions

- There is some evidence that income distribution is becoming less equal
- Not as dramatic as the political rhetoric
- Wage differentials reflect the fact that most new jobs don't come with high productivity
- Successful companies pay higher wages, which also contributes to wage inequality
- Class struggle arguments not supported by the data

The Road Ahead

The Road Ahead

- Growth, productivity and income distribution are important topics
- Traditional tools not well suited to analyzing the issue
- Focusing on inadequate aggregate demand puts attention on the wrong issues
- What about the next administration?
- Infrastructure stimulus in an economy at full employment is dangerous
- Federal Reserve will have to play catch up



Playing Catch Up

- Can the Fed control inflation if the economy overheats?
- Global macro prudential concerns may cause the Fed to delay raising rates
- Initial impact of raising rates may be to stimulate
 - Short term impact will be to increase incomes of savers
 - Investment response will lag
 - Undoing fiscal drag from global negative rates will take time
- May wind up chasing expectations
- Hindered by the capital markets and reliance on “real balance” impact
- Possible re-run of the 1970s



Some Better Ideas

- Recognize that supply side economics deals with the long run, while demand side economics addresses cyclical pressures
- Focus on growth in GDP per capita, not merely GDP
- Focus on consumption per capita or personal income per capital
- Recognize implications of productivity on leisure and imports
- Develop policies that address the reduction in quantity and quality of labor and which address the productivity issues in service industries