

## The Rising Risk of Economic Downturn

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### GDP Generating Capacity of Global Debt: All Major Economies

		2007 Ratio of GDP to Debt	2017 Ratio of GDP to Debt	% change
1.	Euro Area	0.46	0.38	-17.2%
2.	United Kingdom	0.44	0.35	-19.3%
3.	Japan	0.33	0.27	-17.6%
4.	United States	0.45	0.40	-10.6%
5.	China	0.68	0.39	-42.9%
6.	G (20) aggregate	0.48	0.41	-14.4%
7.	Emerging markets (aggregate)	0.83	0.52	-37.0%
8.	All reporting countries (aggregate)	0.48	0.41	-14.5%
9.	Advanced economies (aggregate)	0.42	0.36	-13.5%

Source: Bank of International Settlements.

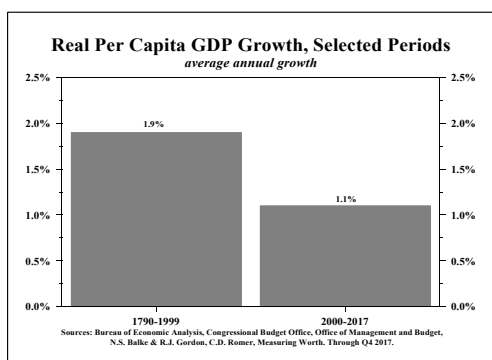
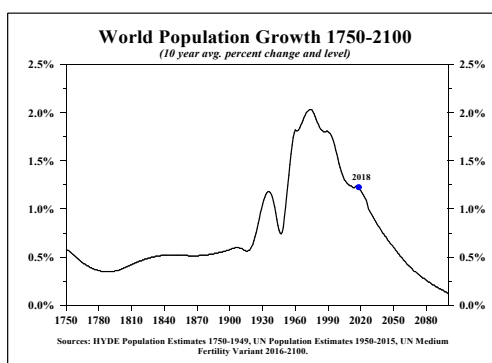
# Technology and Diminishing Returns

1. Technology is another factor that must not be overlooked. While many dramatic advances are underway, the role of invention in the future trend of U.S. and global growth is more complex than is generally understood.

2. Robert J. Gordon, a distinguished Professor of Economics at Northwestern University and author of *The Rise and Fall of American Growth: The U.S. Standard of Living Since the Civil War* (2016), considers today's inventions to be more evolutionary than revolutionary since they do not entail the massive use of labor and natural resources of the past. Gordon looked at inventions from the great American economic growth era of 1870 to 1970. The five major inventions - electricity, modern communications, the internal combustion engine, urban sanitation, and pharmaceuticals and chemicals - greatly enhanced the demand for labor and natural resources and resulted in complete economic involvement. Information technology, while life changing in many ways, impacts a narrower economic segment.

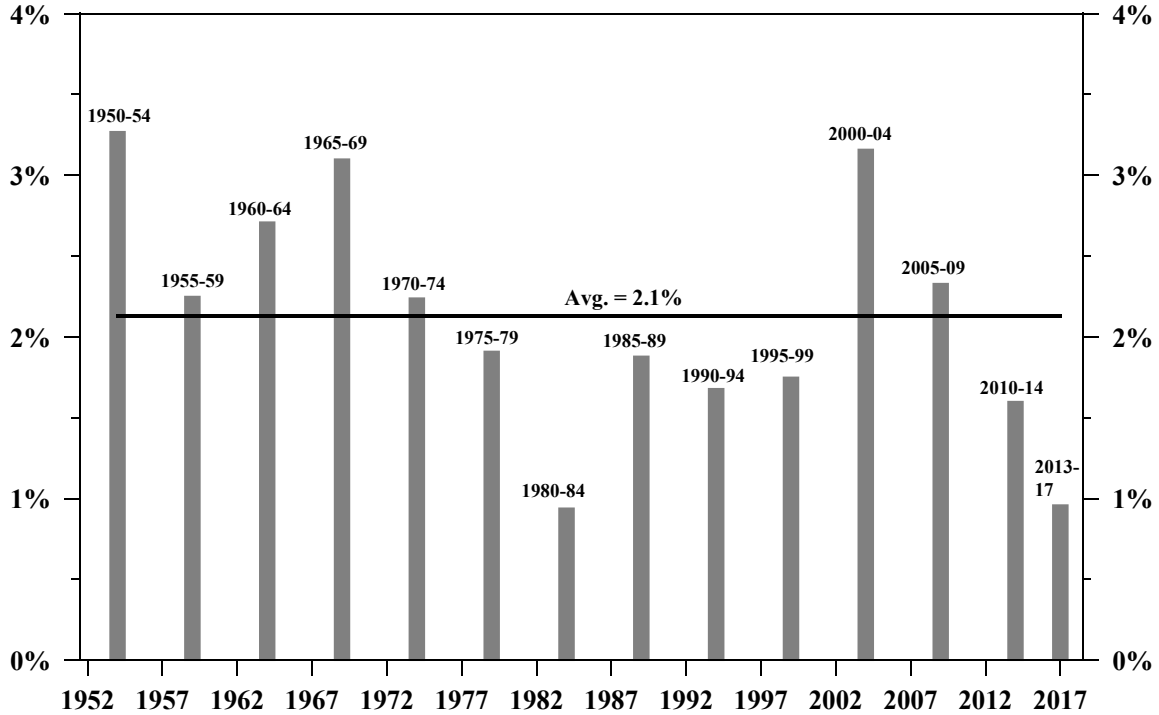
3. Furthermore, business productivity from the late 20th century's digital revolution has stalled these past two decades due to innovation saturation. Viewed from a longer-term perspective, the differential effect of present inventions is already apparent. In his working paper, "Why Has Economic Growth Slowed When Innovation Appears to Be Accelerating?" (National Bureau of Economic Research, 2018), Gordon calculates that the decline in economic growth in the last decade is a stunning seven times lower than the average growth rate for the fifty years between 1920 and 1970, in real GDP per capita terms.

4. If Gordon's view is somewhat overstated, it nevertheless appears that some current technological inventions will tend to depress demand for two other factors of production - labor and natural resources. According to available data from the U.S. Bureau of Labor Statistics, there are approximately 3.25 million cashiers, 1.96 million driving trucks and 2 million operating machine tools and assembly lines. Using robots for these functions does not materially change the demand for natural resources but renders obsolete more than 7 million jobs.



# Productivity

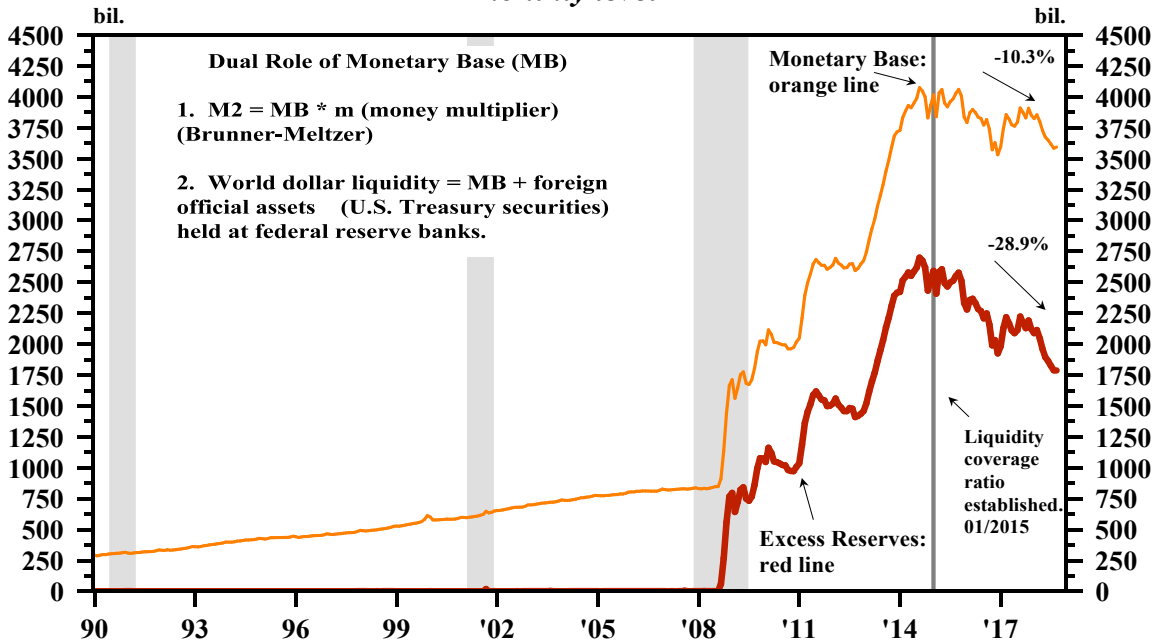
5 year periods, 5 year a.r.



Sources: Bureau of Labor Statistics. Through 2017.

## The Monetary Base vs. Excess Reserves of U.S. Depository Institutions

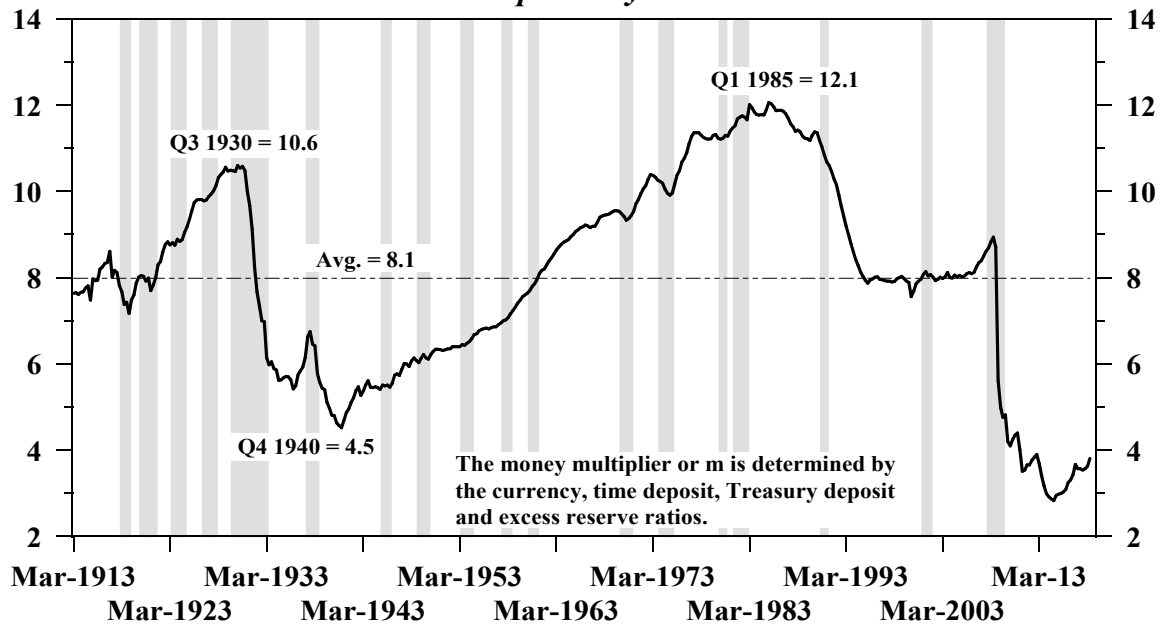
monthly level



Source: Federal Reserve Board. Through Sept. 12, 2018.

## Money Multiplier (m or 3.6) = M2 (\$13.9 tril) / the Monetary Base (MB or \$3.8 tril.)

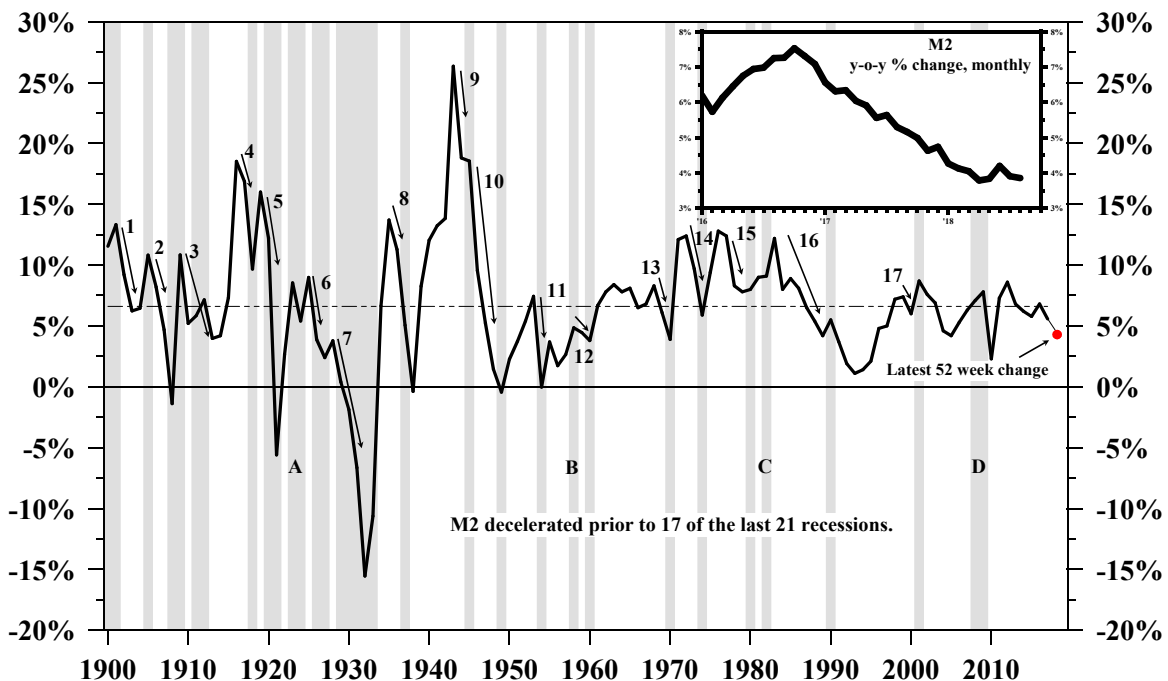
*quarterly*



Sources: Federal Reserve, St. Louis Federal Reserve. The American Business Cycle; Robert Gordon. Through Q2 2018. Money multiplier equals M2 money supply divided by the monetary base.

## M2 Money Stock

*annual % change*

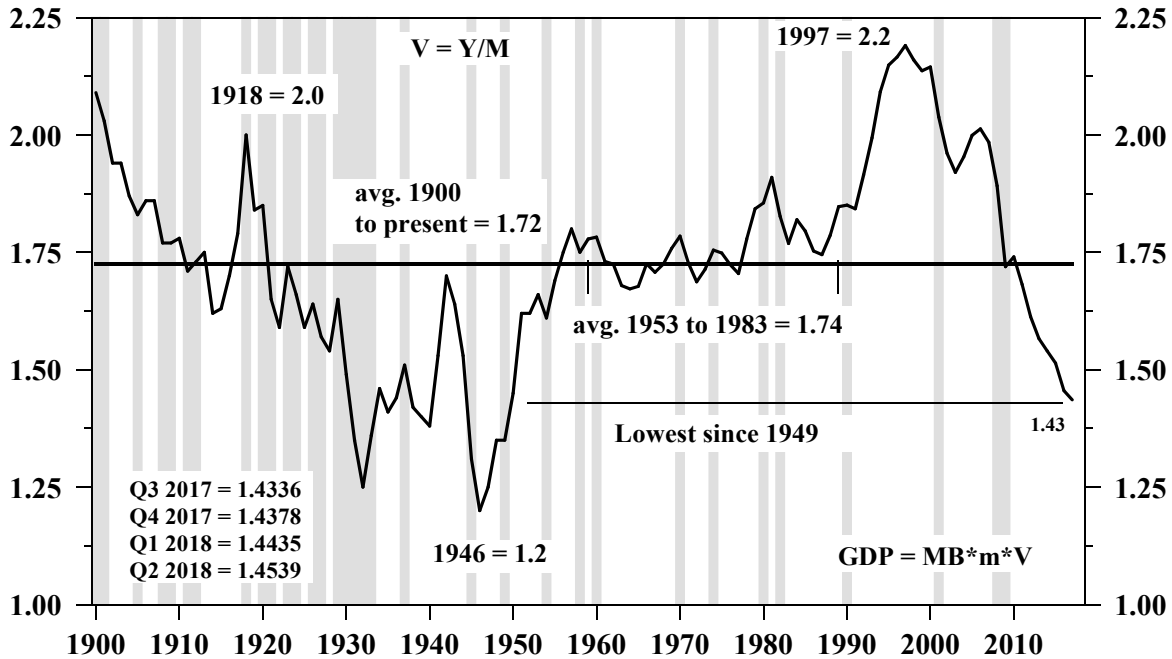


Source: Federal Reserve. Through December 2017. (Inset chart through Sept. 10, 2018.)

# Velocity of Money 1900-2017

Equation of Exchange:  $M \cdot V = \text{GDP}$

*annual*



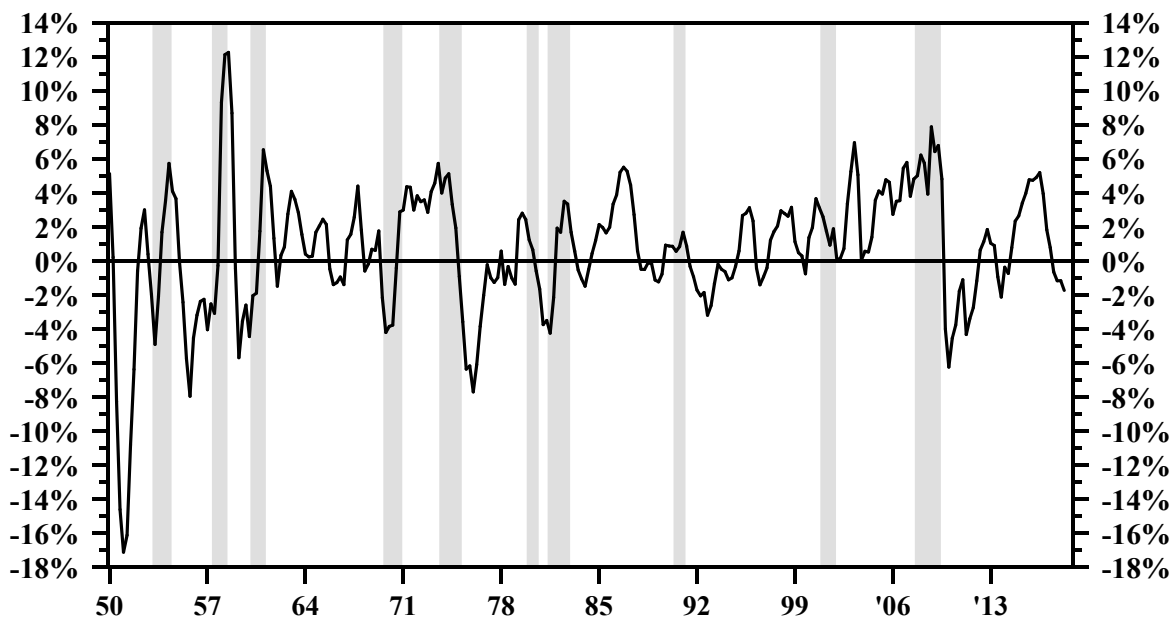
Sources: Federal Reserve Board; Bureau of Economic Analysis;  
Bureau of the Census; The American Business Cycle, Gordon, Balke and Romer. Through Q4 2017.  
Q2 2018;  $V = \text{GDP}/M$ , GDP = 20.4 tril, M2 = 14.0 tril,  $V = 1.4539$

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# Wicksell Differential for Banks: Growth Rate in Bank Credit less Growth Rate in GDP

*y-o-y % change, quarterly*

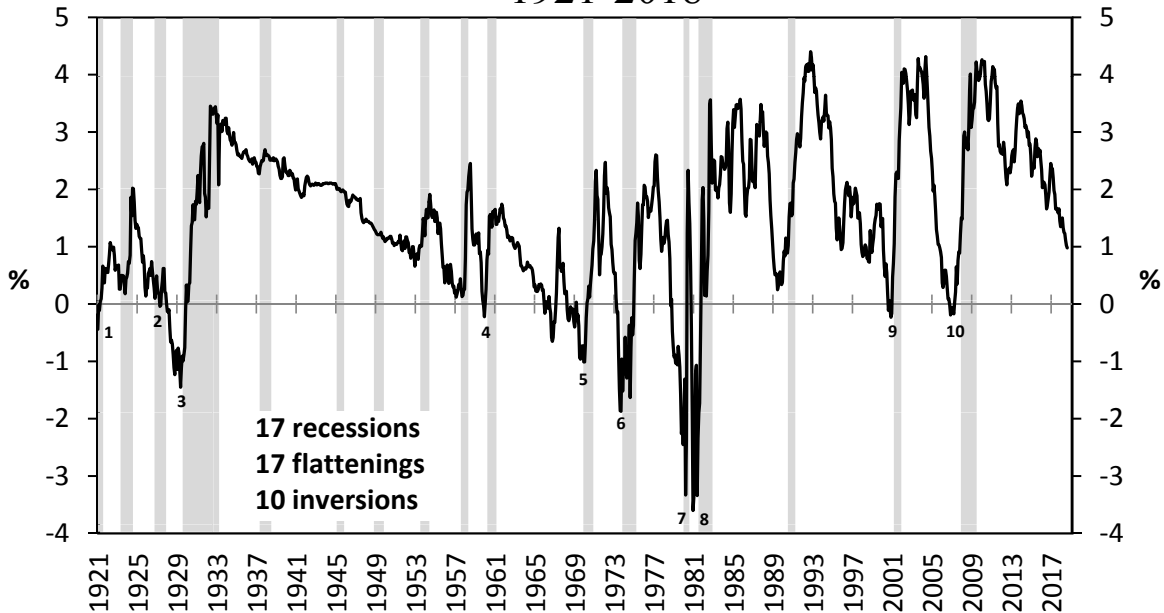


Source: Bureau of Economic Analysis, Federal Reserve. Through Q2 2018.

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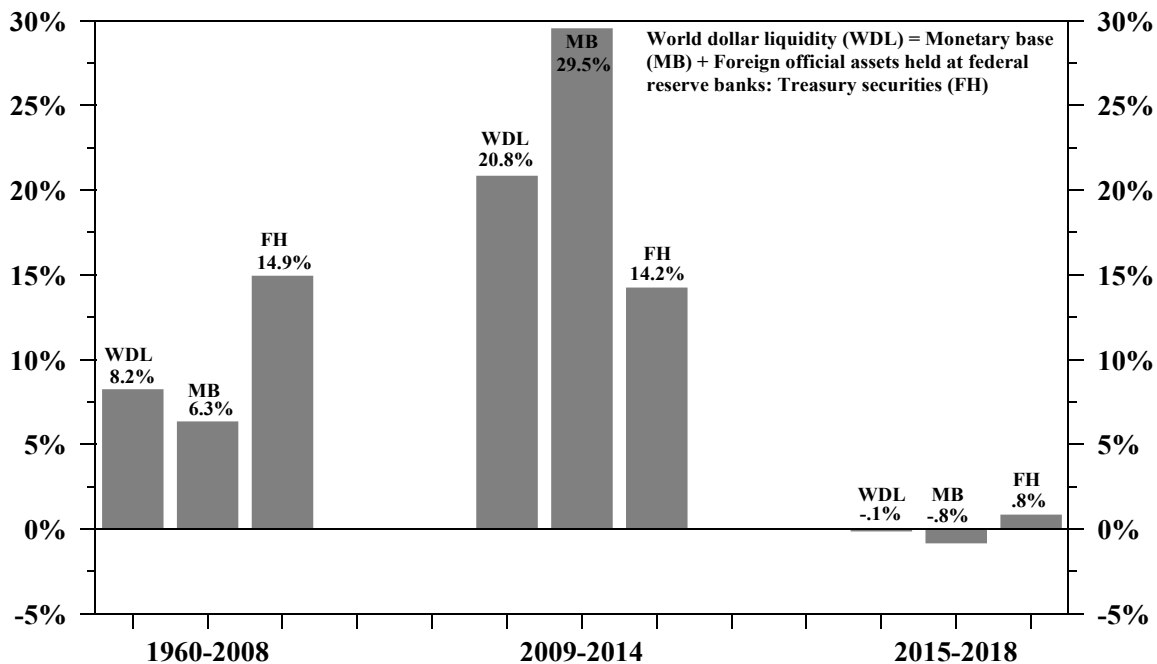
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## Yield Spread Between Long Term Treasury Bonds (*10 years and over*) and the 3 Month Bill 1921-2018

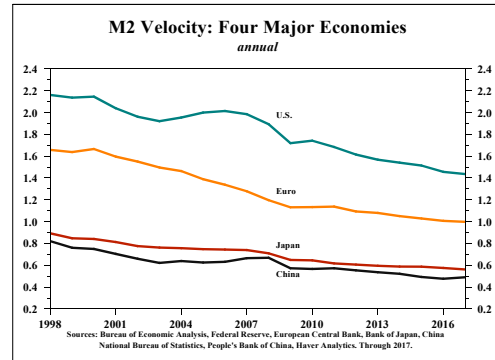
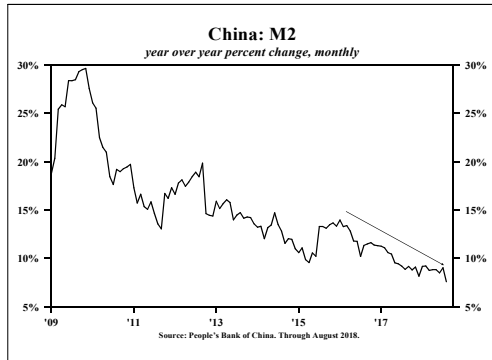
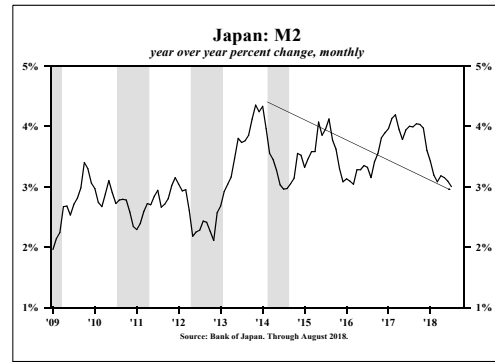
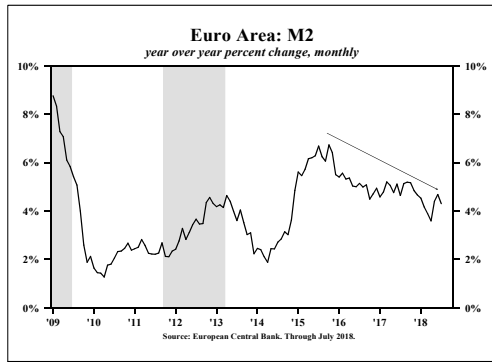


Source: Federal Reserve Board. Through August 2018.

## World Dollar Liquidity *annual average of year over year growth rates*

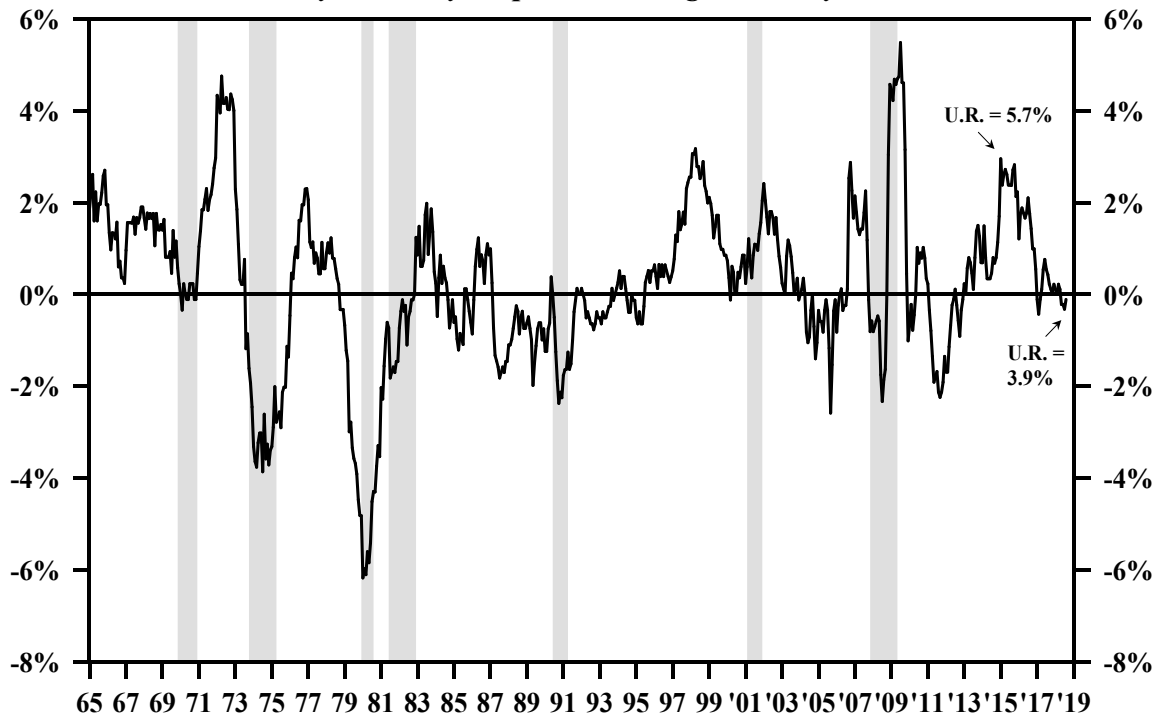


Source: Federal Reserve. Through July 2018.



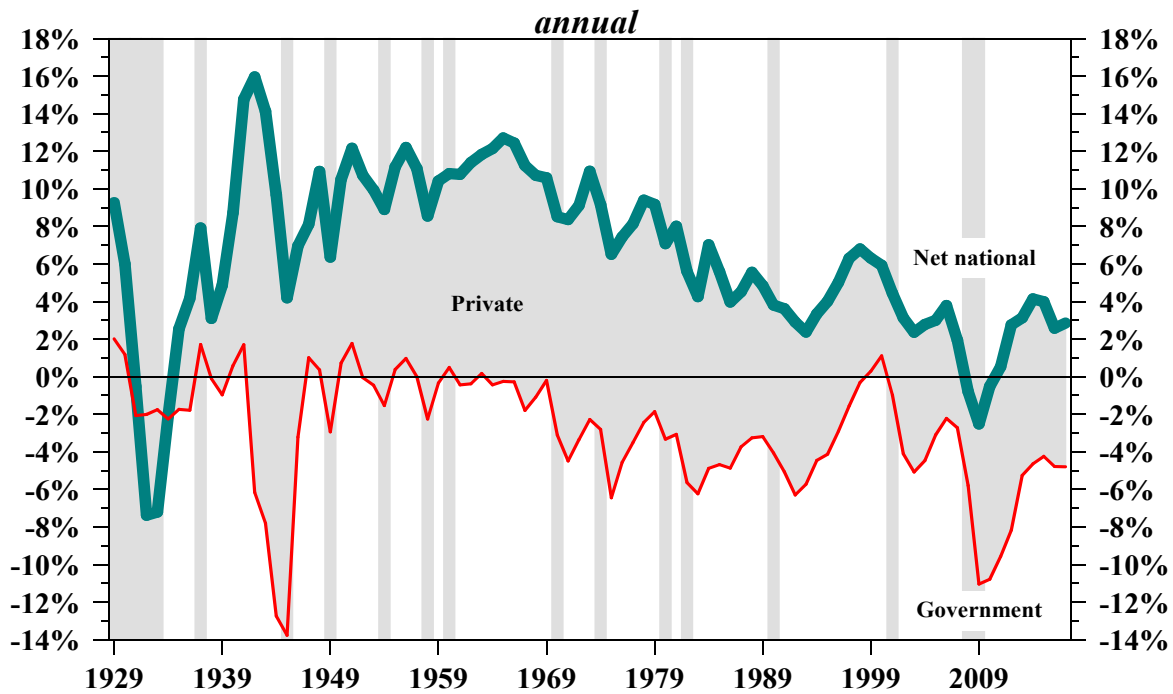
## Real Average Hourly Earnings

year over year percent change, monthly



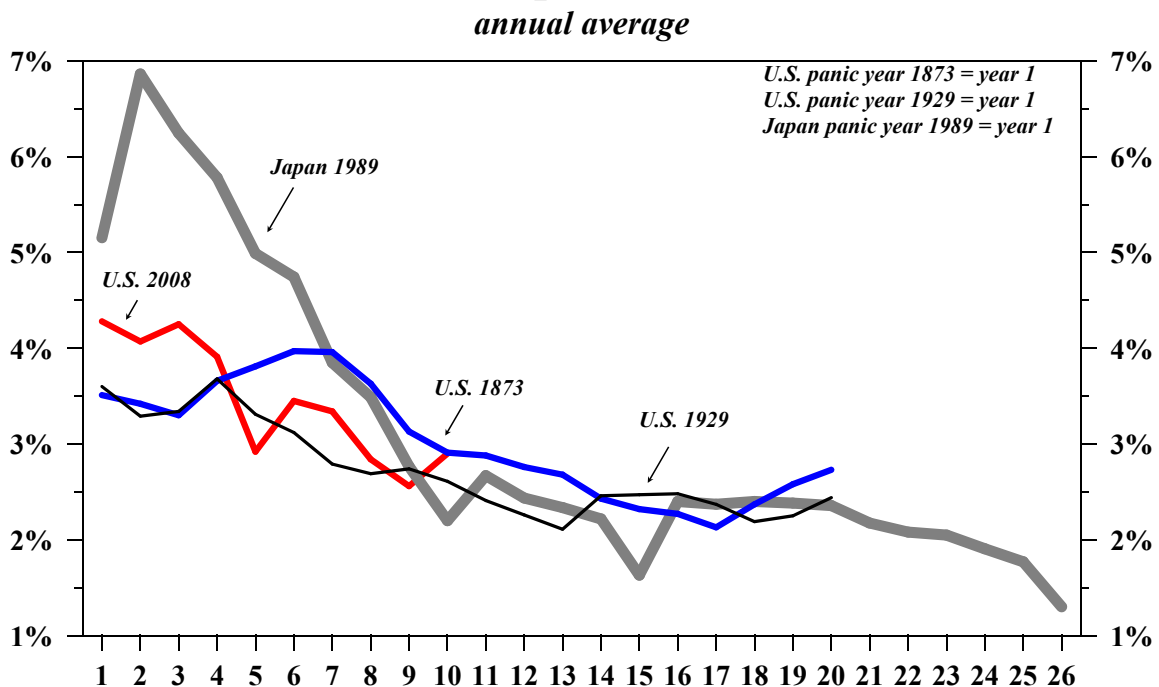
Source: Bureau of Labor Statistics. Through August 2018. (Production and nonsupervisory workers.)

## Net National Saving by Sector as a % of Gross National Income



Sources: Bureau of Economic Analysis. Through 2017.

## Long-Term Government Bond Yields Starting with Historic Panic Years: Japan 1989, U.S. 1873 and 1929



Sources: Federal Reserve Board, Homer & Sylla, Bank of Japan. (U.S. through 2017)