Development of the contemporary financial system

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Broader postwar economic developments
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- Rapid growth of income and wealth
- The Great Inflation and the Great Moderation
- The decline in interest rates
Rise in world income

- Rapid rise in world income in postwar era
  - Approx. 4-fold rise since 1950
  - Compare to approx. 4-fold rise in preceding *millennium*
Growth in world real income 1820–2018

Growth in assets

- Rise in household wealth
  - In U.S. and other countries, recent volatility due to house prices
  - And even greater volatility in ratio to income (→leverage)
- Rise of large capital pools (→safe assets, international imbalances)
  - Hedge funds
  - International reserves and sovereign wealth funds
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Rapid growth of income and wealth

**U.S. household net worth 1945–2015**

Logarithm of household net worth, trillions of 2005 U.S. dollars (left $y$-axis) and ratio to disposable personal income (right $y$-axis), quarterly. Vertical shading represents NBER recession dates. *Source:* Federal Reserve Board, Financial Accounts of the United States (Z.1), Table B.101.
Hedge fund assets under management 1990–2013

Annual, last observation Q2 2013, $ bill. Source: HFR, BarclayHedge.
From postwar growth to Great Inflation

- Growth of GDP through 1960’s high by historical—and current—standards
- **Inflation**: rise in general price levels
  - Equivalently: decline in purchasing power of money unit
- Inflation rises from ca. 1965
  - “**Stagflation”**: high inflation together with low growth
- Collapse of Bretton Woods
  - **Gold-exchange standard** in place 1945–1971
- **Volcker disinflation** late 1979–1984
The Great Moderation

- Period of perceived success of monetary policy
- Ca. 1984 until outbreak of global financial crisis
- Sharp decline in volatility of GDP growth, level and volatility of inflation
- **Interest-rate smoothing:** gradual adjustment of target funds rate
- Policy below rule 2000–06
  - But inflation itself suppressed by low import prices
U.S. inflation 1960–2017

Annual percent change in the consumer price index—all urban consumers (CPI-U), all items less food and energy (Source: U.S. Bureau of Labor Statistics, series CUUR0000SA0L1E), and core Personal Consumption Expenditures price index (PCE) (Source: U.S. Bureau of Economic Analysis). The core PCE is a somewhat broader index and has different weights from CPI-U. Vertical shading represents NBER recession dates.
Explanations for low inflation

- Credibility of monetary policy after 1980
  - Realized inflation low because central banks expected to pursue low-inflation policy
- Real factors:
  - Increase in productivity from 1980 until crisis (technology)
  - International factors: increase in trade, competition
- Since crisis, Neo-Fisherian effect of low interest rates on realized inflation
  - Low interest rates inconsistent with high expected inflation, so latter adjusts
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The Great Inflation and the Great Moderation


Percent change from preceding period in real gross domestic product, U.S. GDP growth, quarterly, percent, seasonally adjusted at an annual rate (black, left $y$-axis), and rolling standard deviation of the past 5 years’ growth rates in percent (red, right $y$-axis). Vertical shading represents NBER recession dates. Source: U.S. Bureau of.
Behavior of U.S. interest rates

- **Nominal interest rates**: measured relative to money units
- **Real interest rates**: measured relative to purchasing power units

  **Equilibrium** or **neutral** or **natural** or **Wicksellian real interest rate**: the real rate that would prevail over the medium term if the economy were in equilibrium

  **Market real interest rate** is that currently prevailing

- Nominal rate can be decomposed into real rate plus *expected* inflation

- Three-decade decline in nominal rates and flattening of yield curve
  - Early manifestation: the Japan trap
  - **Conundrum** in U.S. rates 2004–2005: rising short-term rates, but steady or declining longer-term rates
  - Further decline during global financial crisis, policy response

- Both components of nominal rates falling
  - Expected inflation declining to below 2 percent
  - Real rate of interest declining to zero
U.S. 2- and 10-year nominal rates 1997–2022

Constant maturity U.S. Treasury yields. Data source: Bloomberg LP.
U.S. 2- and 10-year spread 1997–2022

Constant maturity U.S. Treasury yields. *Data source:* Bloomberg LP.
Market-implied and survey inflation 2007–2022

Purple plot: 5-year 5-year forward breakeven inflation; Orange plot: Survey of Professional Forecasters median 10-year-ahead annual average inflation forecast, quarterly. Forward breakeven inflation is the inflation rate over some future interval implied by yields on nominal and inflation-adjusted bonds of two different terms to maturity. Source: Bloomberg LP, Federal Reserve Bank of Philadelphia.
Why the decline in real rates?

- Real interest rates unobservable, must be estimated
  - Models of equilibrium real rate
    - Considerable uncertainty around estimates
  - Market real rate based on inflation-indexed bond yields
    - Doesn’t account for liquidity, inflation-risk premiums
- Possible explanations of low real rates:
  - **Global savings glut hypothesis**: rise in world saving (→ international imbalances)
    - Including demographic reasons: aging population motivates higher saving
  - Demand for **safe assets**
  - **Secular stagnation** driven by low aggregate demand or by slowing technical progress
  - **International balances**: capital flows from less-developed to more advanced countries
- Consistent with low growth of productivity, business formation, and private investment