Using Historical Perspective of Keynesian vs. Neoclassical Macro in Teaching Principles

14th **Fed Prof Conference 2016**

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Federal Reserve Bank of St. Louis

3-4 November 2016

Evolutionary Approach to Teaching Macro

Principles of Macroeconomics: An Evolutionary Approach; Jan. 2017

- **Great Depression to Great Recession**
- **Fisher vs. Keynes**
- **Neoclassical vs Keynesian**
- **Lectures including Online FRED.**
- **Homework including EconLowdown Modules.**
  - **Using State of Art Econ Govt data & Online Modules.**
  - **Without reliance on Proprietary Online Services.**
  - **Adjust as FRED, EconLowdown Advance/Evolve.**
  - **(In FRED We Trust).**

What We Teach Matters: Not Just How

- **What is an Economic Fallacy?**
- **What is an Economic Fact?**
- **What is a Macroeconomic Principle?**
- **What Math can we use?**
- **Can We Tell the Story of Macro?**

Fallacies: AS-AD derivation.

- **Keynesian Cross gives $AS - AD$ analysis.**
- **IS-LM gives $AS - AD$ analysis.**
- **Phillips curve gives $AS - AD$ analysis.**
- **Oil Price Theory of Stagflation gives $AS - AD$ analysis.**
- **David Colander, 1995, "The Stories We Tell:**
  - **A Reconsideration of AS/AD Analysis."**
  - **Journal of Economic Perspectives, 9(3): 169-188.**

Stylized Facts

- **Normal Real Business Cycle Stylized Facts**
- **Solow Growth Facts of balanced growth path.**
- **Phillips curves during Asset Market Booms & Busts**
- **Bank Collapse Causing Crises of Grt Depress & Grt Rec.**
- **US Lost Decades: 1929-1939 & 2007-2016.**

Macro Principles

- **S & D for capital depends on Real Interest Rate:**
  - **Fisher 1896 Model allows "Ramsey" RBC explanation.**
- **Ramsey (1928) underlies Neoclassical & (New) Keynesian.**
- **Ramsey World $AS - AD$ underlies Dyn. Stoch. Gen Equil.**
- **Ramsey World $AS - AD$ depends on real price of Gds to Labor:** $1/w$.
  - **Ramsey World S&D in Labor market depends**
  - **on real price of Labor to Goods:** $w/1$.
  - **Real Interest Rate constant in Ramsey World**

Math We Can Use

- **Graphs of Data over time: FRED mainly.**
  - **Plus BLS graphs, NIPA Dpt Comm.& OECD tables.**
- **Graphs of Functional Data, in time: Phillips Curve**
  - **Can Construct Using FRED data in Excell.**
- **Graphs of Functions between 2 Variables:**
  - **eg. Price, Quantity; Output, Input.**
- **Graphs of Functions Shifting:**
  - **Comparative Statics Change in one Parameter.**
- **Tables.**
- **Equations: Simple Algebra Only**
  - $C + I + G = Y = GDP$; $R = r + \pi$; $GDP = GDI$.
  - Maybe: $wl + rk - \delta + G - T = Y = GDI$
  - $(A \cdot B + C \cdot D + E = F)$.

Story to be Told

- **Microeconomic to Macroeconomic Foundations**
- **Comovement & Crises**
- **Cycles & Growth**
- **Policy**

Micro Principles Used in Macro

Microeconomic to Macroeconomic Foundations

- **PPC, Production Function, Indifference Curve.**
  - **Diminishing Marg Prod. & Marg Utility; Mrkt Structure.**
  - **Supply & Demand as function of Relative Price**
  - **Comparative Statics**
- **Smith, Ricardo, Bentham, Jevons, Menger, Walras,**
  - **Malthus, Darwin, & Marshall**
  - **Labor Theory of Value vs Neoclassical Theory of Value**
- **Application: Gasoline Prices & Loss of US World Auto Mrkt**
  - **Current Dollar Gas Prices vs Real Dollar Gas Prices**
- **Appendices: How Darwin Solved Shape of Production Curve**
  - Plus: **Graphs & Data; Using FRED;** $y = a + bx$.
- **EconLowdown Module: Supply & Demand**
  - **Review of S&D basics + Comp. Statics**

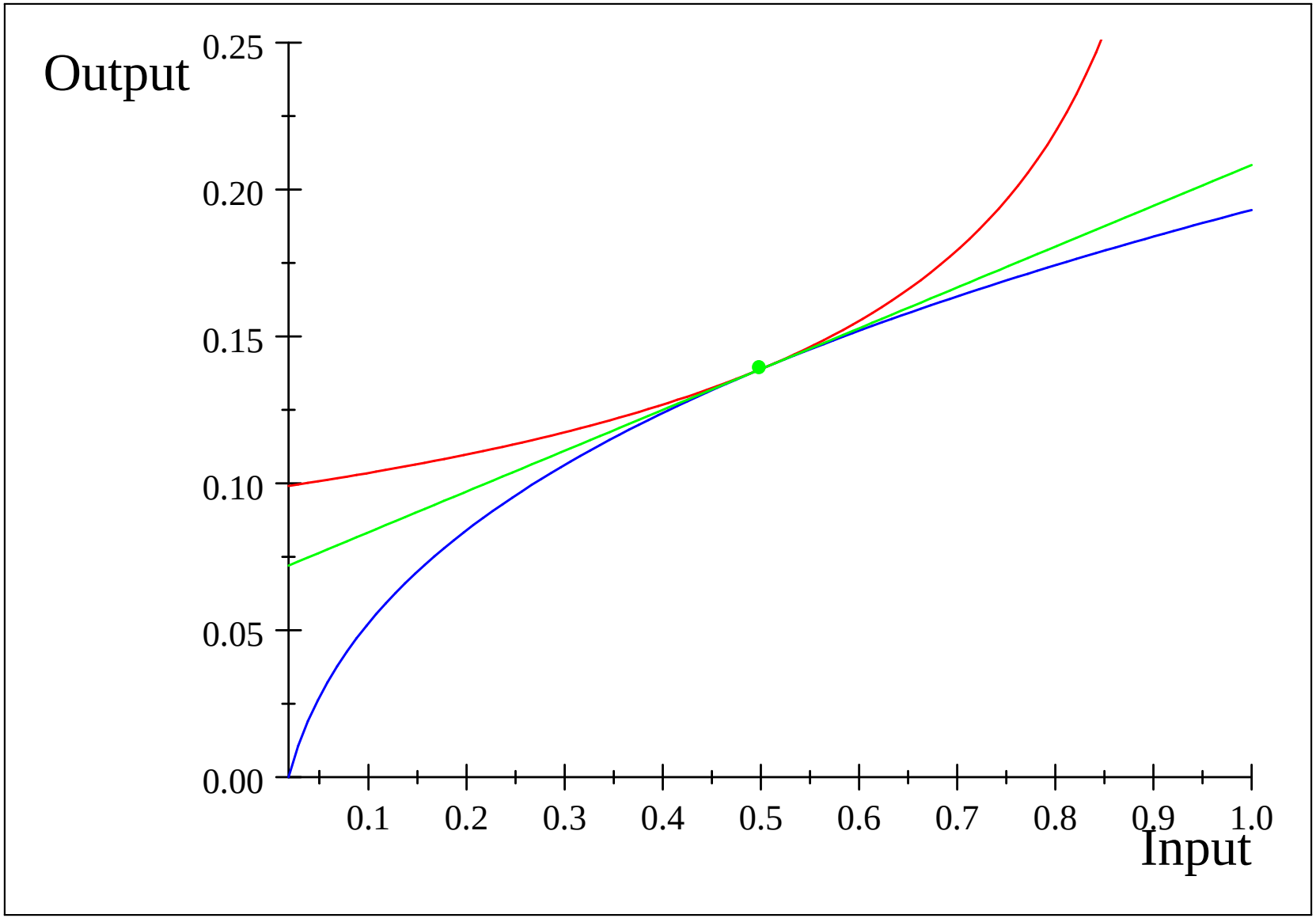
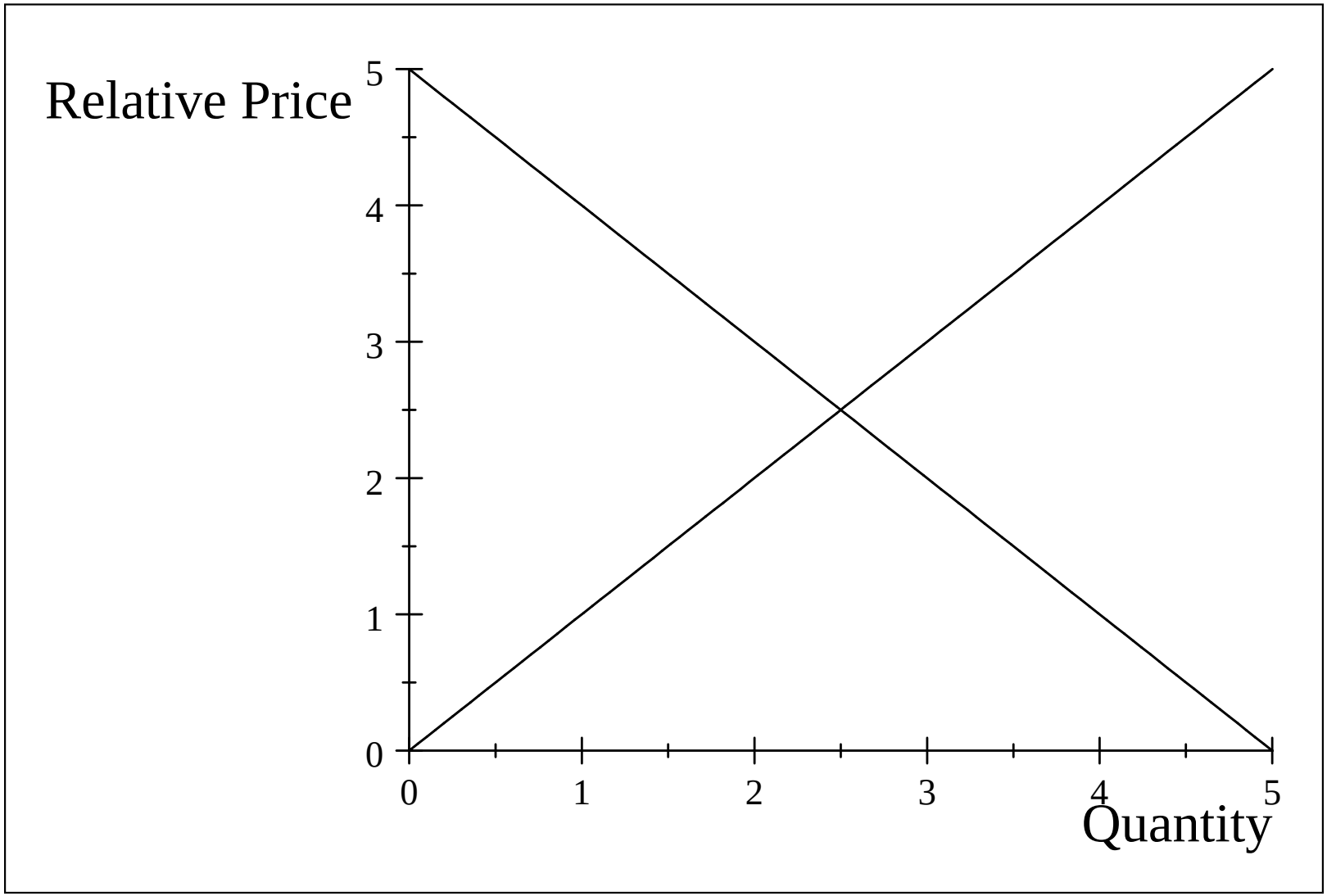


Figure: General Equilibrium Production Function (Blue) and Utility Level Expressed as Indifference Curve (Red).


Relative Price
5
4
3
2
1
0
0
1
2
3
4
5
Quantity

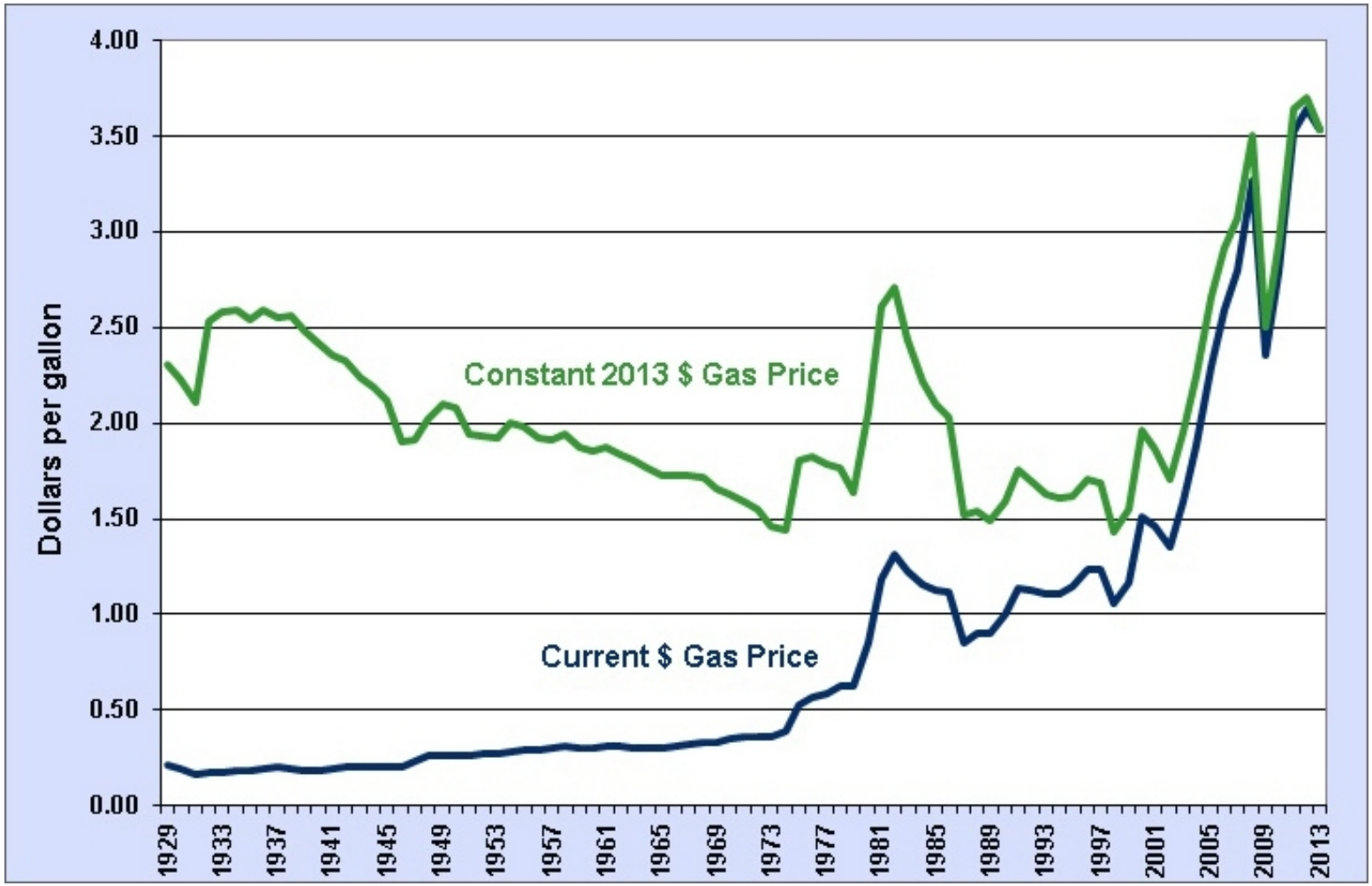


Figure: US Gasoline Prices: Actual & Constant 2013 Prices, 1929-2014.

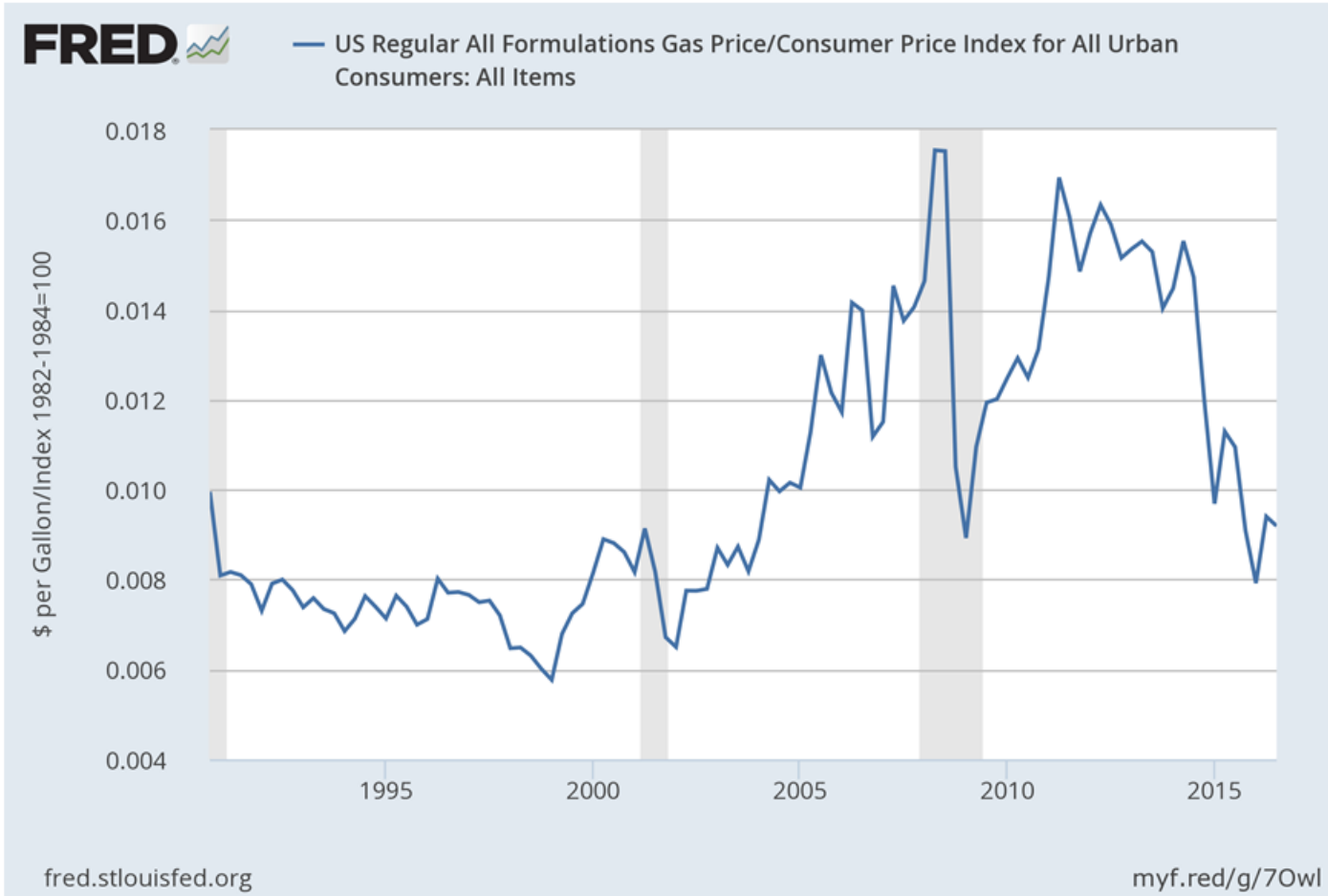


Figure: US Gasoline Index divided by All Items CPI, 1990:4 - 2016:3.

Aggregate Output and Income

Microeconomic to Macroeconomic Foundations

- **National Output & Income Accounting**
  - **NIPA Tables for GDP & GDI**
  - **4 Categories of Each GDP & GDI**
  - **Kuznets & Stone; Fisher (price index).**
  - **Nominal vs Real: Using the Price Index**
- **Production of Output from Input**
  - **General Function and Graph**
  - **Representative Agent Economy**
  - **Circular Flow: GDP = GDI**
  - **Classical Dichotomy: Nominal & Real Economy**
- **Application: US Real & Nominal GDP Growth**
  - **Appendix: Nominal vs Real Interest Rate: Fisher eqtn.**
- **EconLowdown Module: GDP & Pizza**

Macro Divergence from Micro

Microeconomic to Macroeconomic Foundations

- **Great Depression: Facts (FRED)**
  - **Real GDP, Unemployment, Inflation, Currency/Deposits.**
  - **Govt Spending including Defense and not.**
  - **Comparison to Great Recession Facts.**
- **Bifurcation of Macro Theory**
  - **Neoclassical Approach: Fisher, Hayek Debt-Deflation.**
  - **Keynes's Approach: 1930 Cross, Thry of Bus Cycle.**
  - **National Accounting and Keynesian Cross**
  - **Profit $\equiv$ I - S; Excess Savings Spent by Govt.**
  - **Add Keynes 1936 Consumption Function**
  - **Stabilization Policy Arises.**
- **Applic: Grt Depression using Keynes Cross.**
  - **Append: Keynes's Price Theory vs. Marshall's.**
- **EconLowdown Module: Great Depression 1 & 2.**

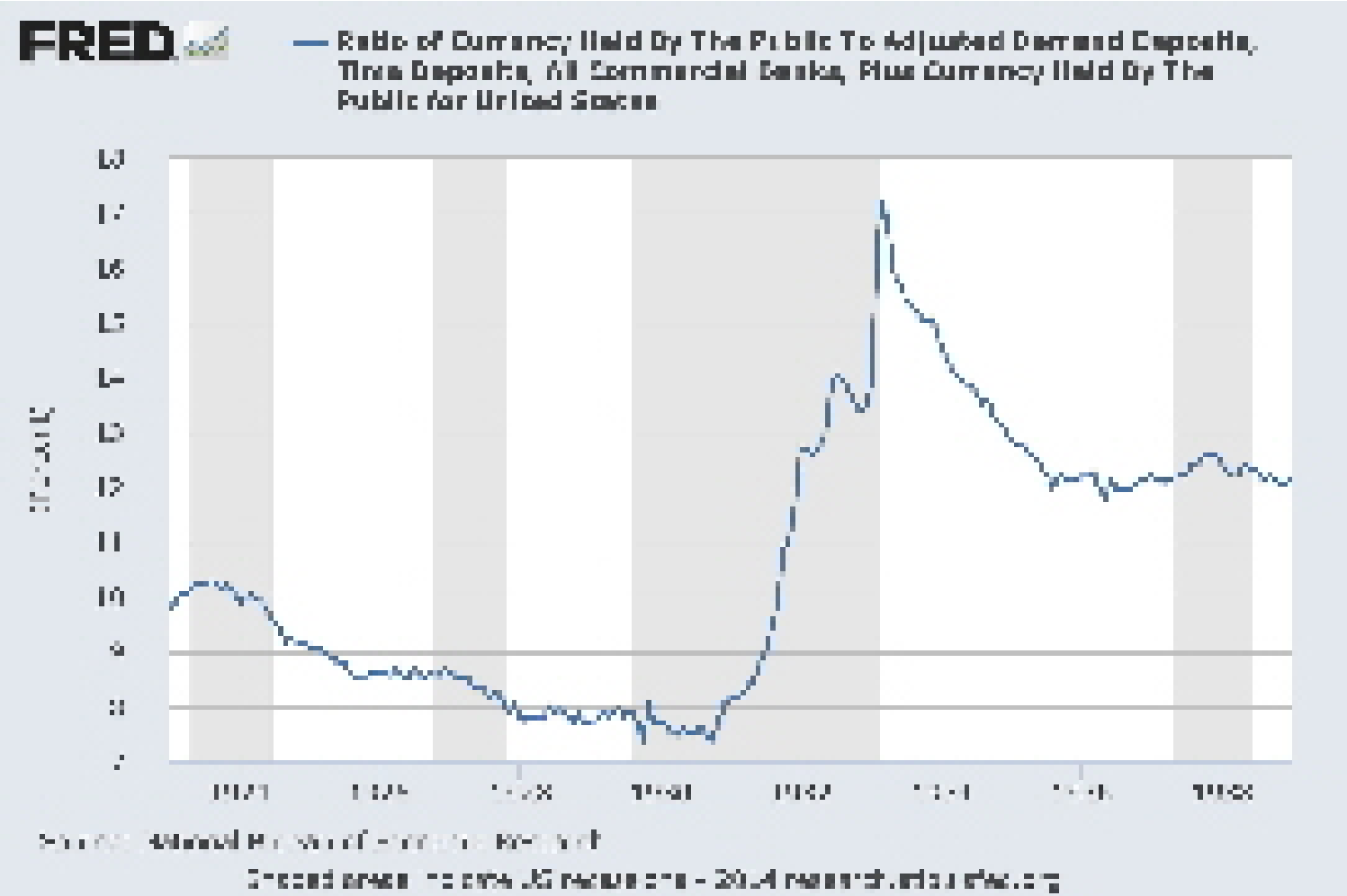


Figure: US Currency to Demand Deposit Ratio, 1923-1939.

- **Facts of Cycle and Growth Trends (FRED)**
  - **Shares of GDP & GDI over Cycle**
- **RBC Theory & Growth Theory & Crisis Theory**
  - **Friedman & Schwartz (1963) vs Kydland & Prescott (1982)**
- **Applic: Equity Premium Puzzle.**
- **Append: Structural Transformation by Sector;**
  - **Why Doesn't Capital Flow from Rich to Poor Neighborhoods?**
- **EconLowdown Module: Unemployment.**

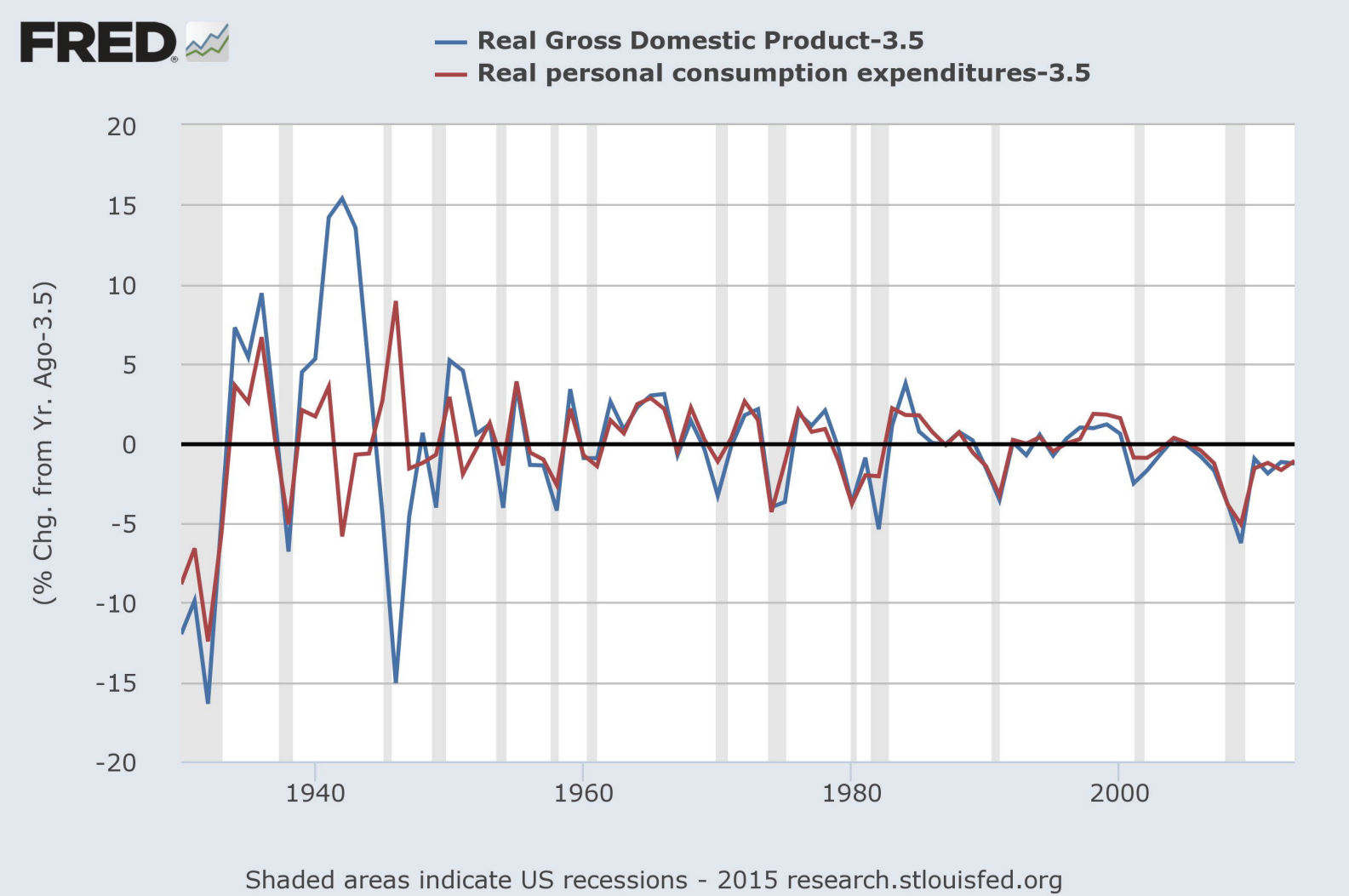


Figure: US 1930-2014, Growth Rate of Both Real Personal Consumption Expenditure (Red) and Real GDP (Blue) Minus 3.5% (trend growth rate).

- **Public Bank & Private Bank Money**
  - **Monetary Aggregates (FRED).**
  - **Govt's Central Bank: the Fed;**
  - **Bank Panics Leading to Fed.**
  - **Institutions & Mrkts.**
- **Theory of Money Demand & Fisher.**
  - **Quantity Theory, Inflation Targeting, Taylor Rule.**
  - **Temp & Permanent Liquidity Effects, & Wicksell.**
- **Applic: Ex-Post US Real Interest Rates.**
  - **Append: Historical Money, Inflation & Debt;**
  - **Fiscal Theory of the Price Level.**
- **EconLowdown Module: Capital Markets.& Monetary Policy.**

- **Facts: WWI, WWII, Korean War & Inflation**
  - **Vietnam war Inflation: a period of "Peacetime".**
  - **Granger Causality of Oil Prices by Money & Inflation**
  - **Killian & coauthors on monetary causes of Oil prices.**
- **Oil Price Shock Theory of Stagflation: Mankiw (2015)**
  - **AS-AD with nominal prices vs Relative Prices.**
  - **Monetary hypothesis of "OPEC Oil Shocks".**
  - **Inflation Tax & Long run Growth.**
  - **Phillips Curves: Theory, Evidence & Debt-Deflations.**
- **Applic: Grt Depres. Turning Pt with '33 Banking Act & FDIC**
- **Append: US Banking Acts 1930's and 2008.**
- **EconLowdown Module: Great Inflation, Grt Depres. 3 & 4.**

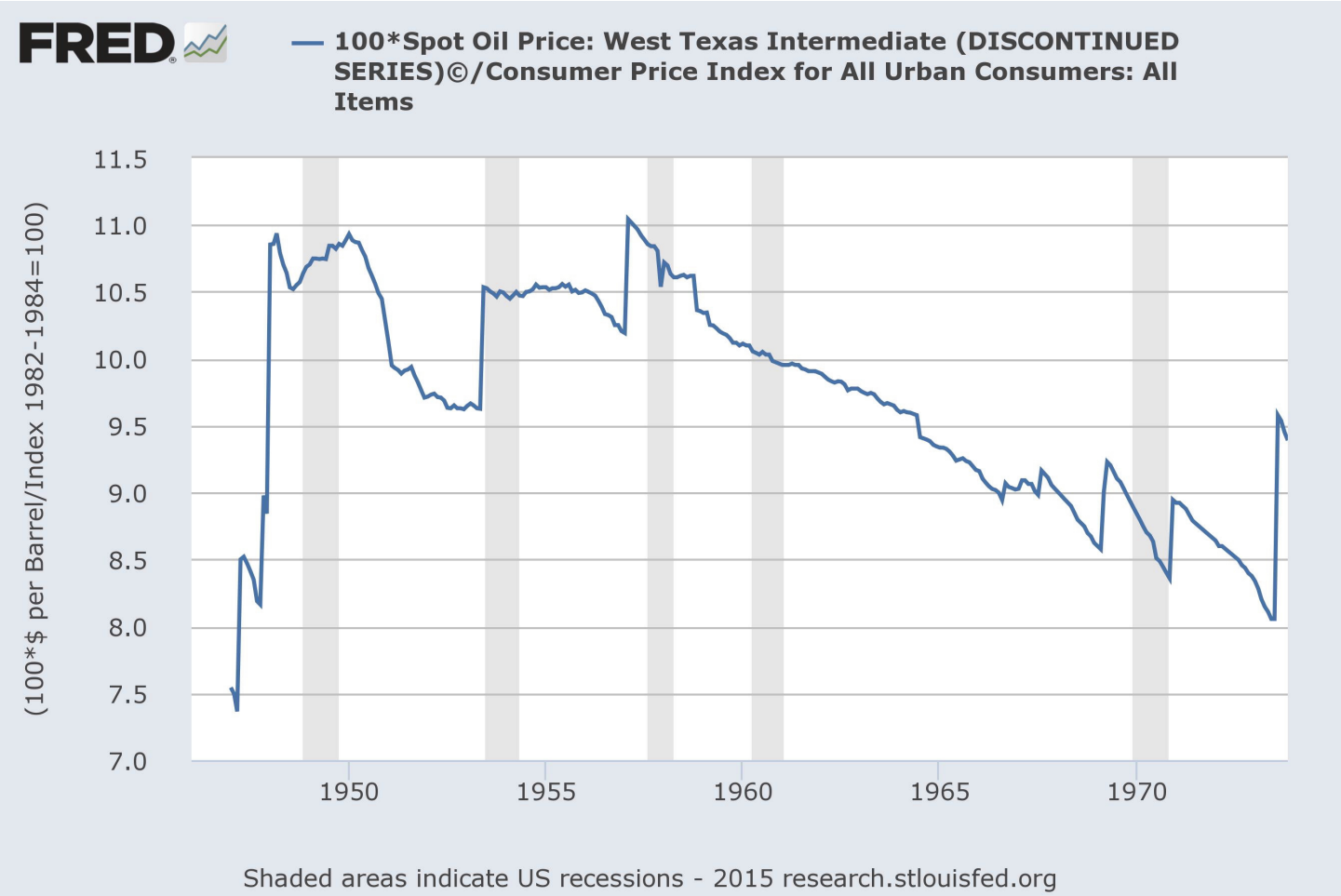


Figure: Real WTI Oil Prices, from Jan. 1947 to Dec. 1973: WTI US$ per barrel divided by US CPI index, in 1982 Constant Dollars.

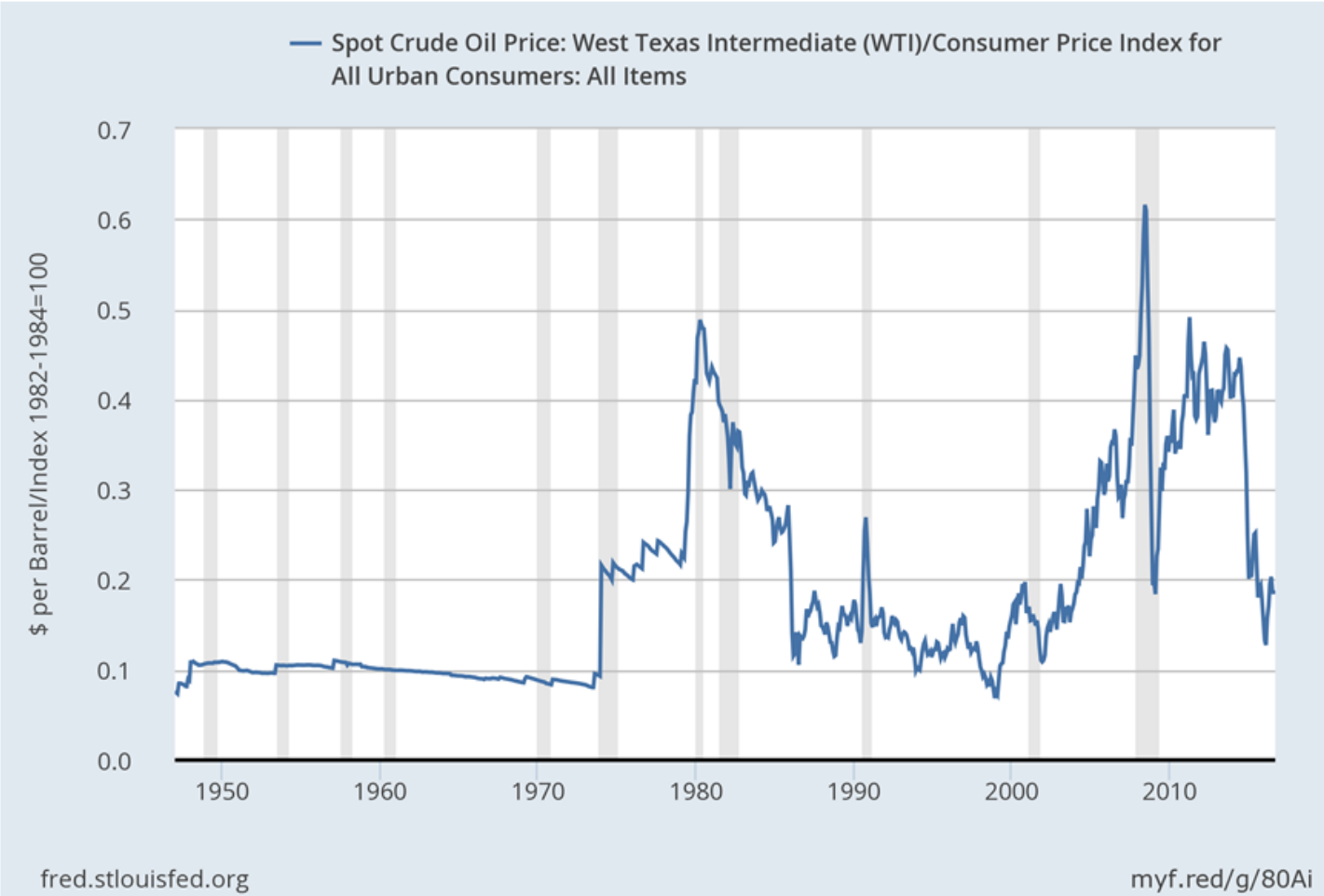


Figure: Real Oil Prices in 1982 US Dollars, 1947 -2016.

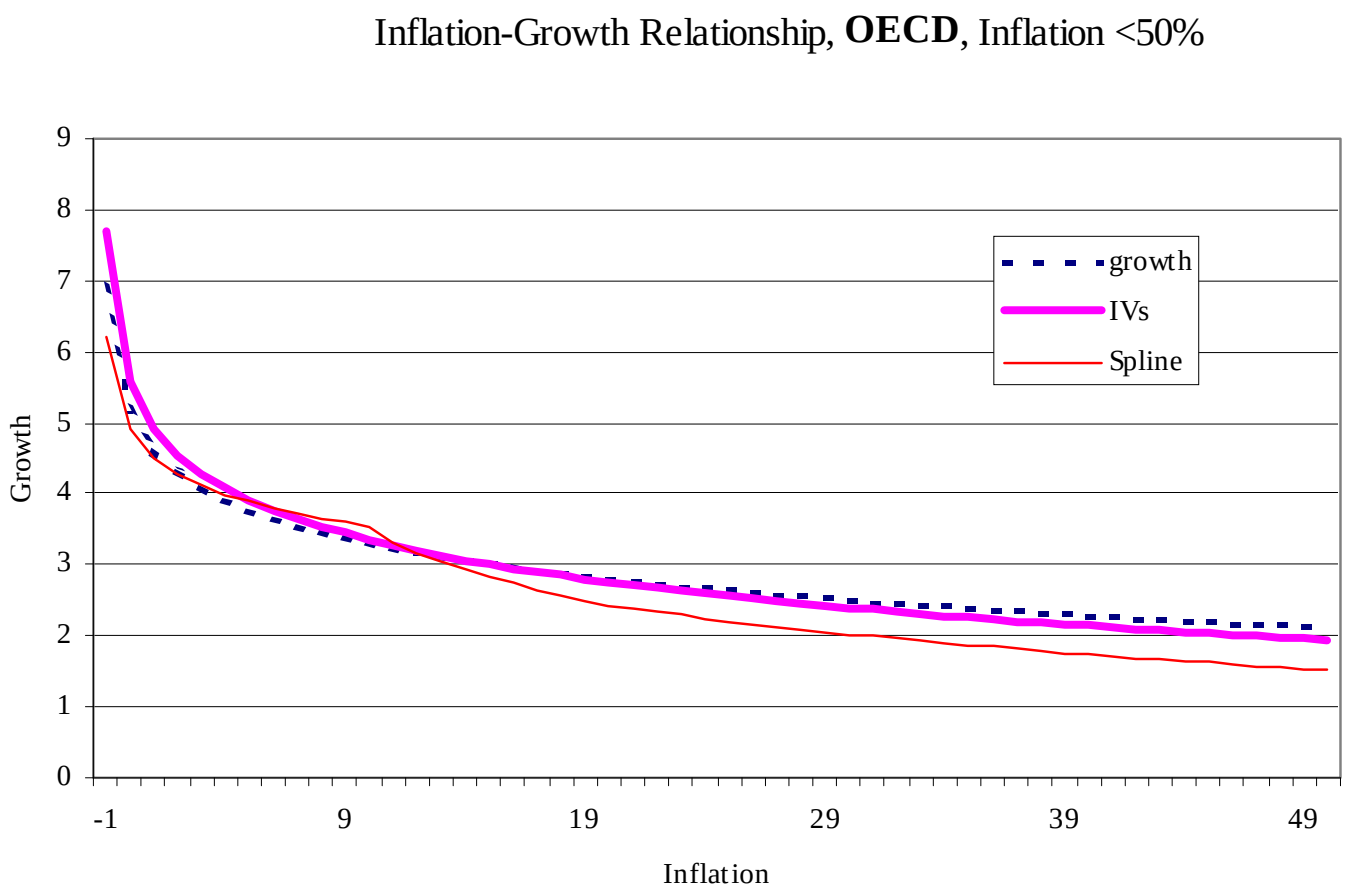


Figure: Effect of inflation on real GDP Growth rate, OECD developed country sample set; panel data estimation.

Phillips Curves: During Bank Productivity Change

And Corresponding Stock Market Change: Debt-Deflation & Credit-Inflat.

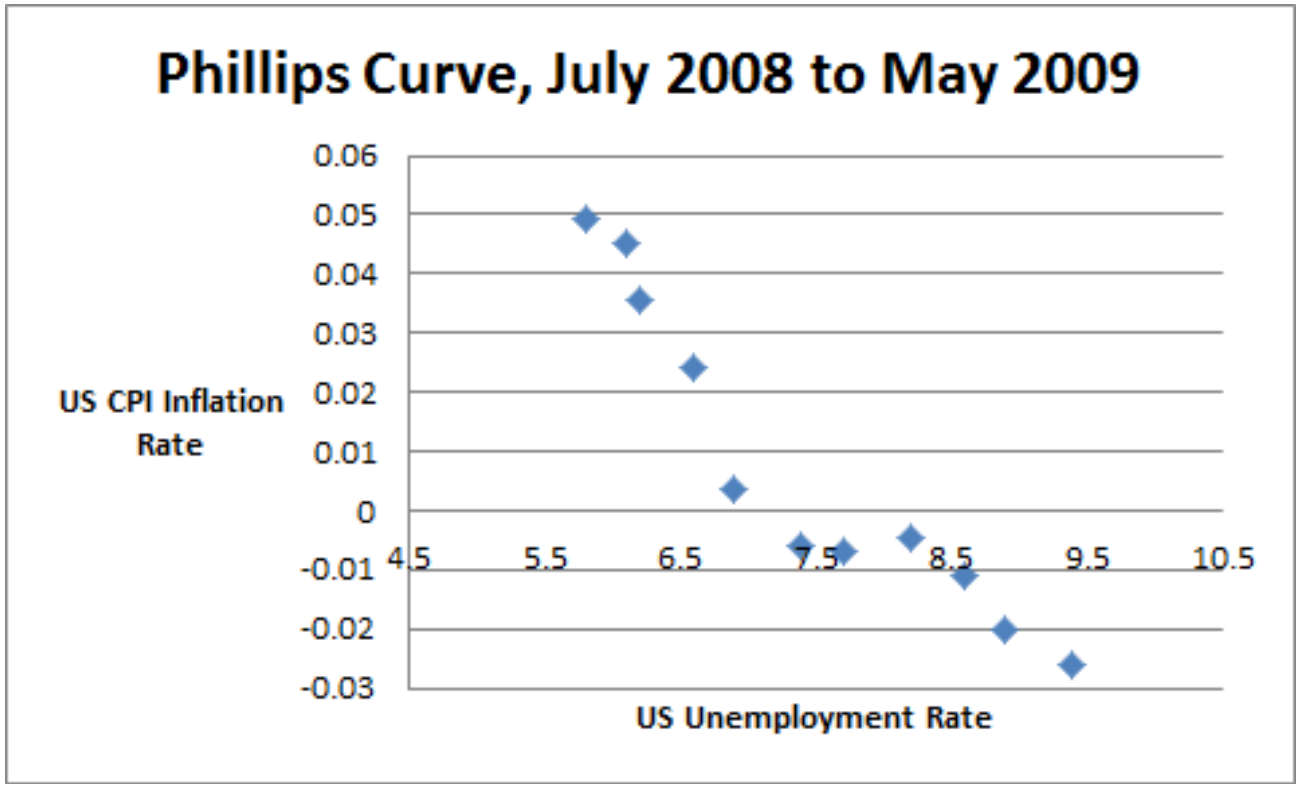


Figure: Phillips Curve During US Stock Market Crash and the Great Recession

July 2008-May 2009 Stock Crash with Bank Crash

Figure: S&P 500 Index During Great Recession.

May 29-May 33: US Great Depression

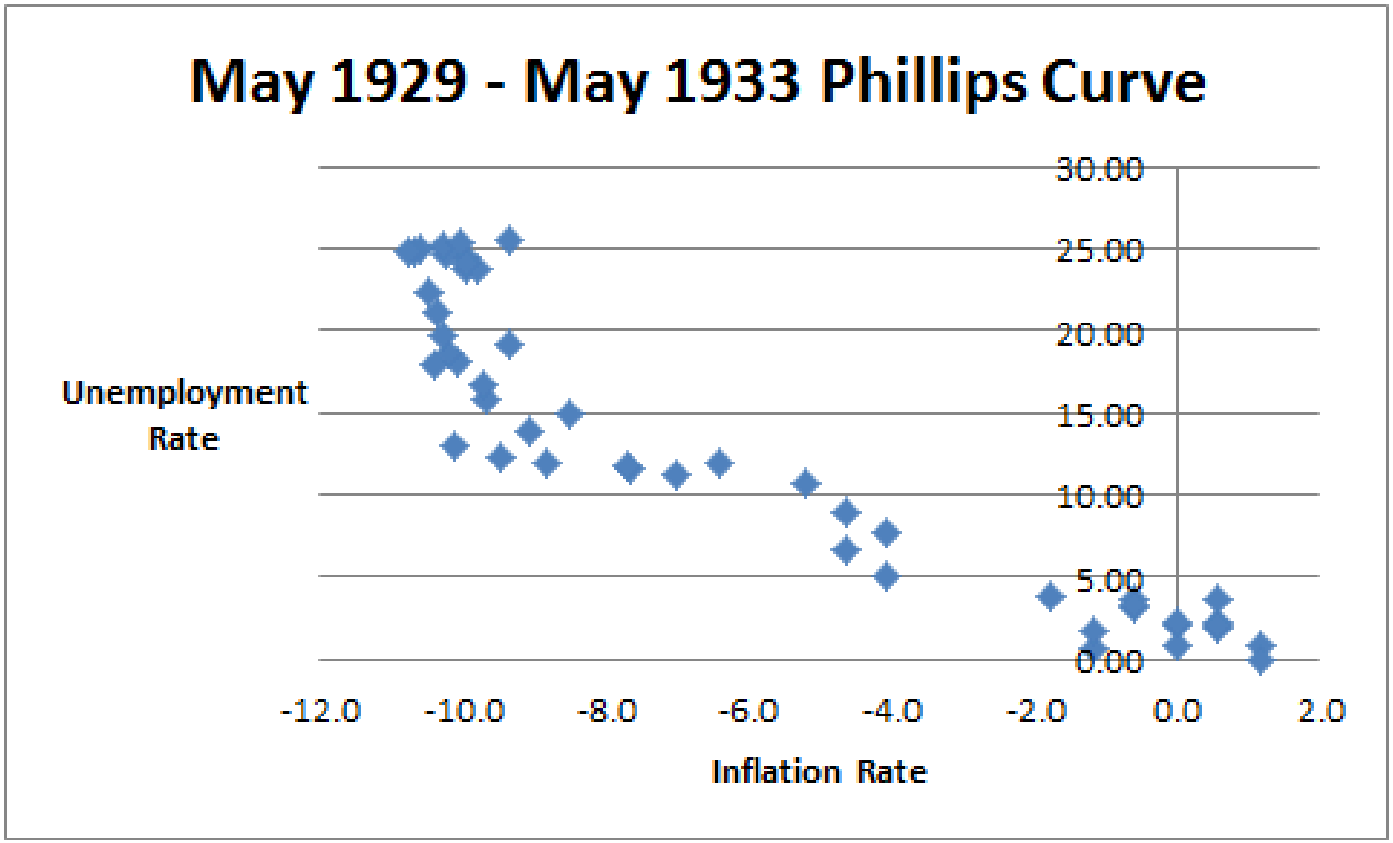


Figure: US Phillips Curve During Great Depression

Grt Depres. Stock Market Crash with Bank Crash

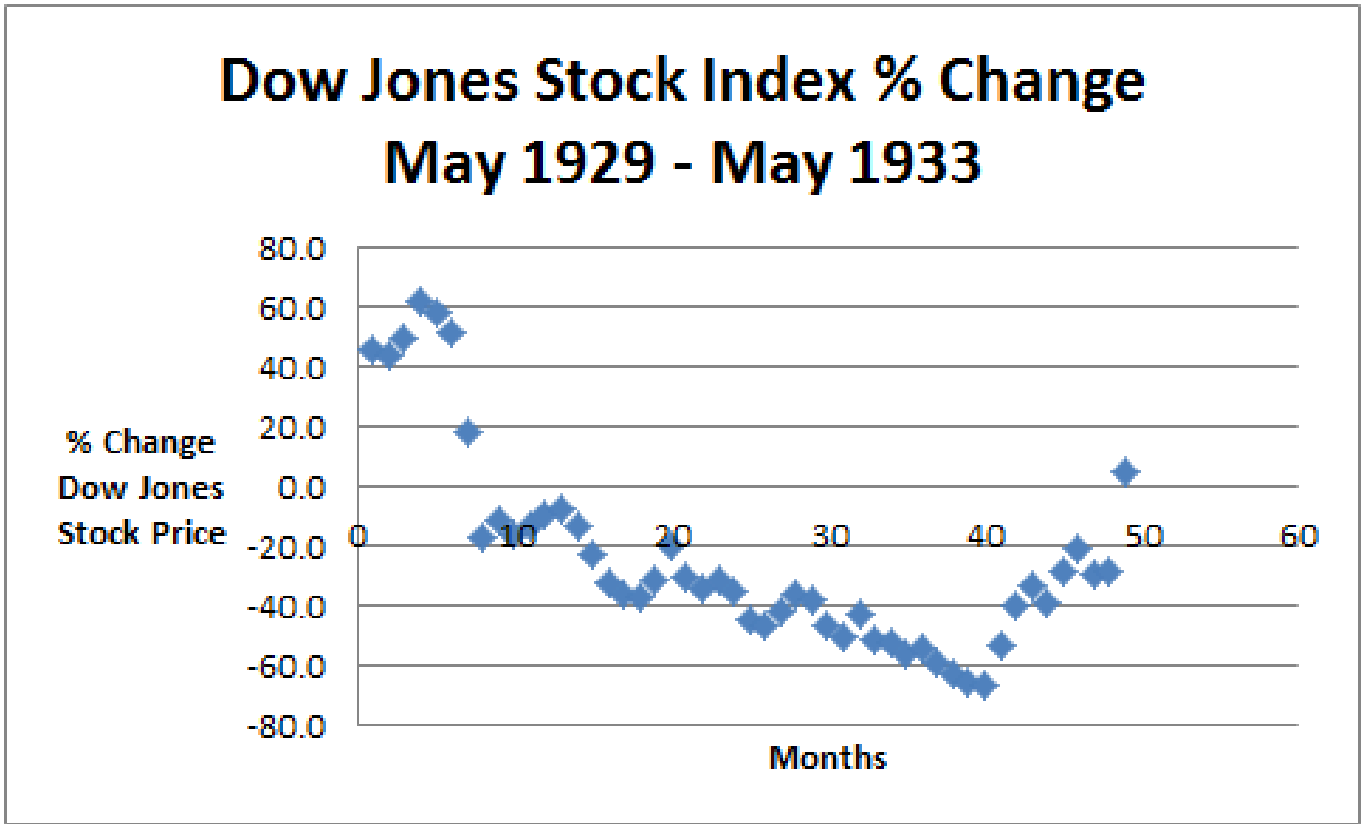


Figure: Dow Jones Industrial Average Percentage Change in Great Depression

1960s "FAMOUS" Phillips Curve

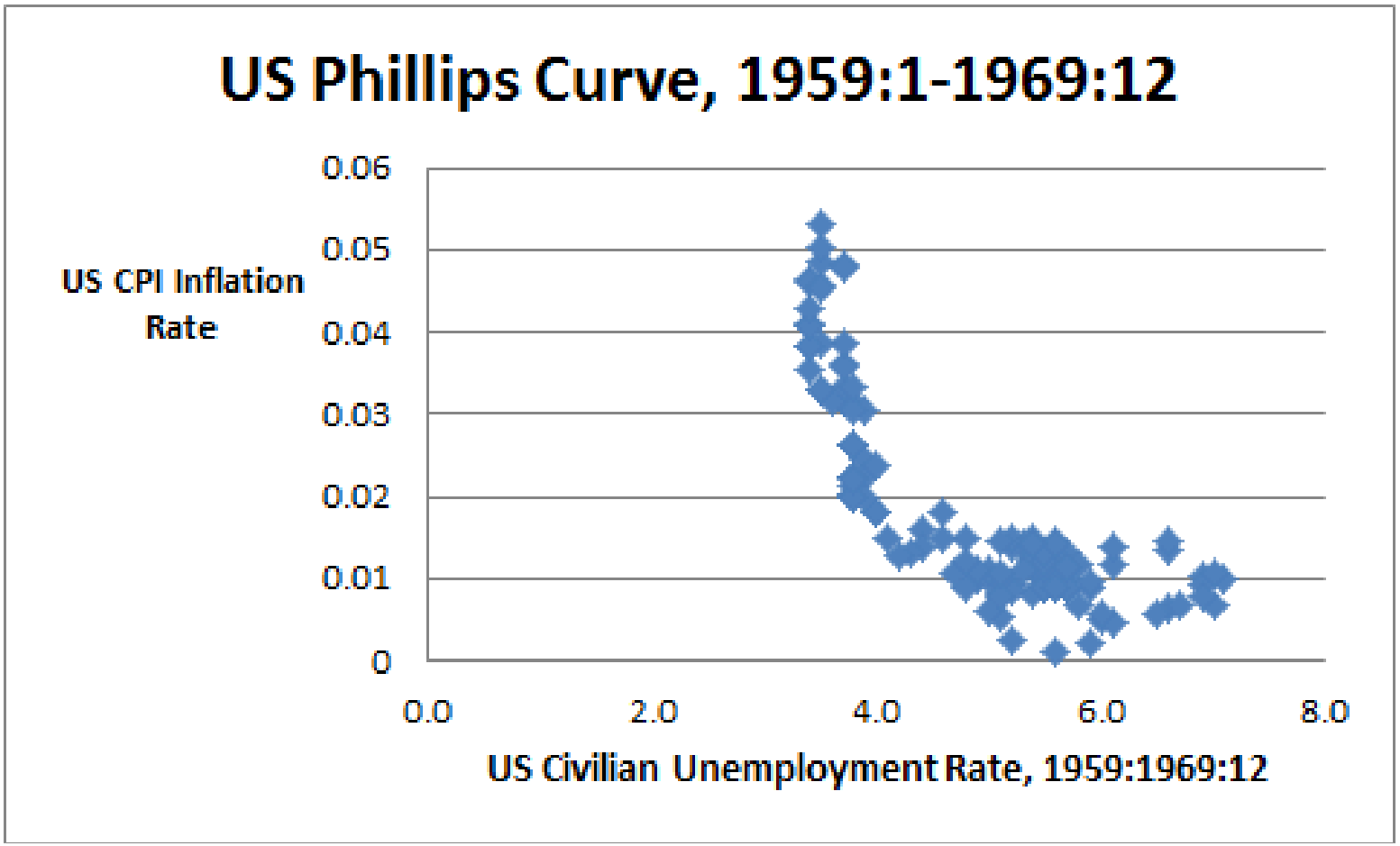


Figure: Phillips Curve from 1959:1 to 1969:12

Dawn of Multinational Corp & Global Finance: Bnk Prod. Boom

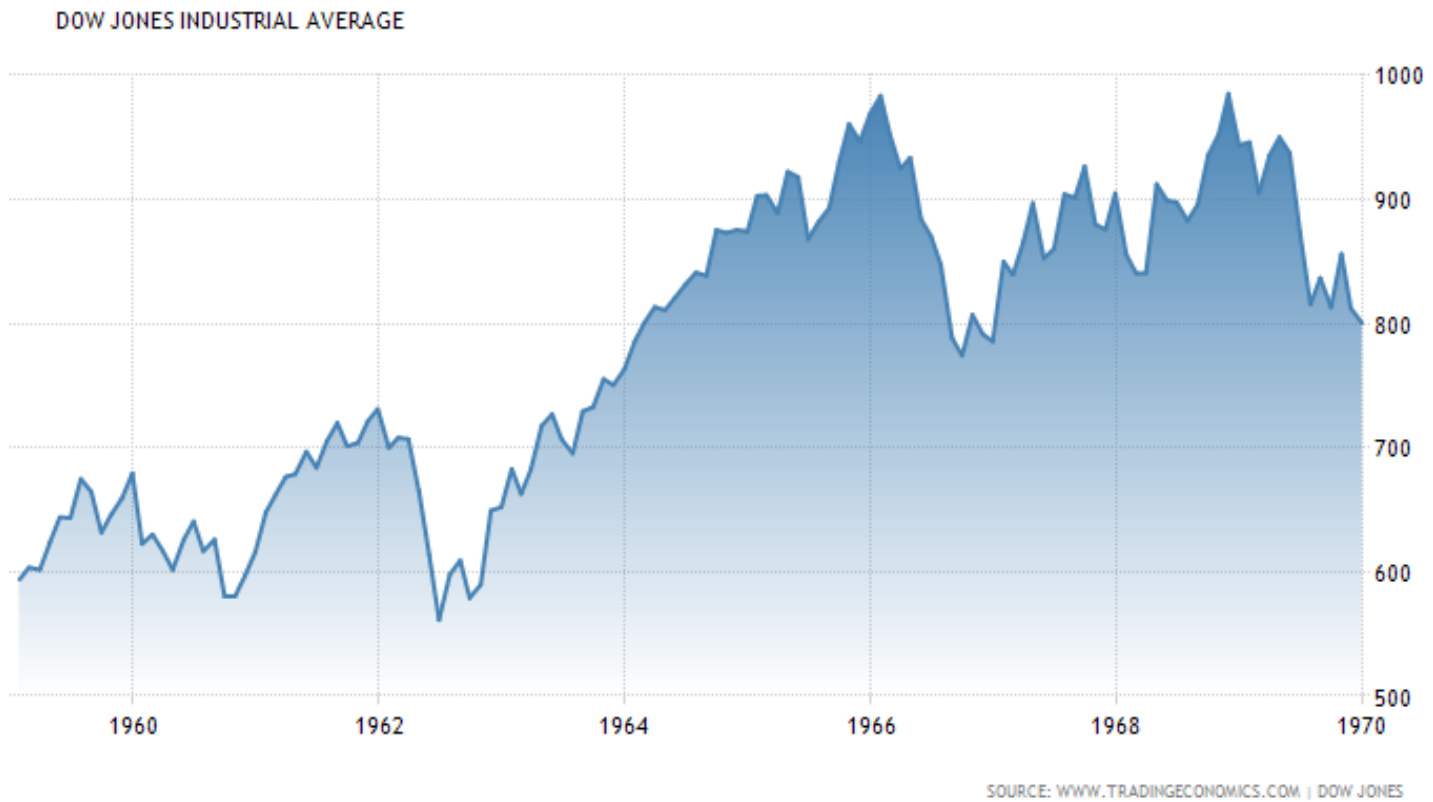


Figure: Dow Jones Industrial Average during the 1960's.

Savings, Investment & Interest

Cycles & Growth

- **Facts: Income Flow on Wealth; Savings & Investment data.**
- **Keynesian Analysis of Capital Market**
  - **IS: Supply shifts out by more than Demand, when $Y \uparrow$;**
  - **"Excess Savings" & Downward sloping IS.**
  - **LM: D shifts out by more than S ; LM slopes up.**
  - **Horizontal Lines on Solow Growth path: general case.**
  - **Policy: Govt Spending & Money increases Good.**
- **Fisherian Neoclass. 2-period Model of Sav & Invest.**
  - **Business Cycle Explanation: just 2 joint Comparative Statics.**
  - **TFP increase, and y_0 endowment increase.**
  - **Get Keynes (1936) only graph with y_0 endowment increase.**
- **Applic: Present Discounted Value.**
- **Append: Savings & Investment data on same basis (FRED).**
- **EconLowdown Module: Time Value of Money; & Soar to Savings.**

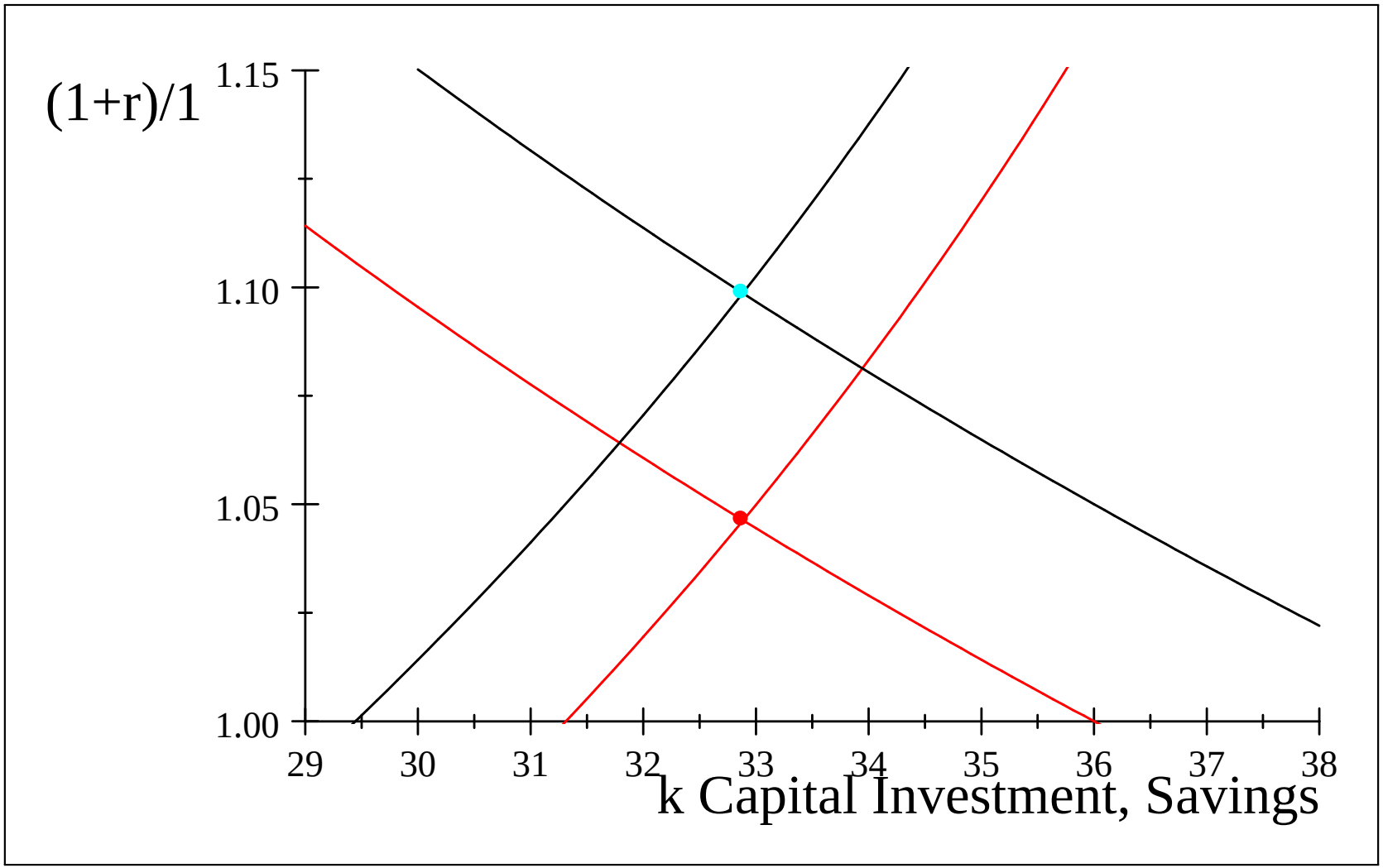


Figure: Shift Back in Supply and Upwards in Demand for Capital (Black), from a Productivity Increase Relative to Baseline (Red): Capital Investment (and Savings) Unchanged, but Interest Rate Higher.

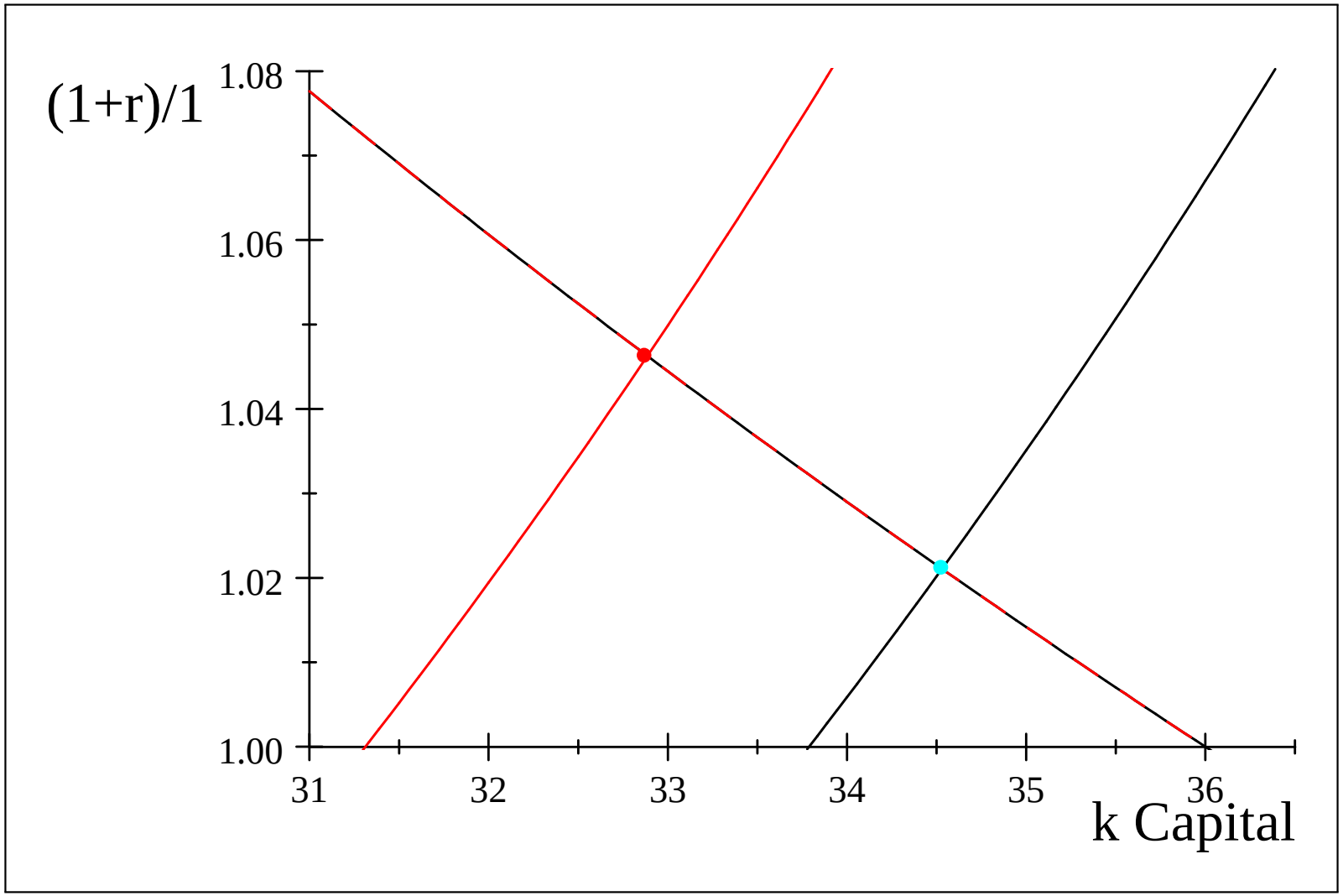


Figure: An Increase in Current Income Endowment Shifts out the Supply of Capital (Black Curve) and Lowers the Real Interest Rate.

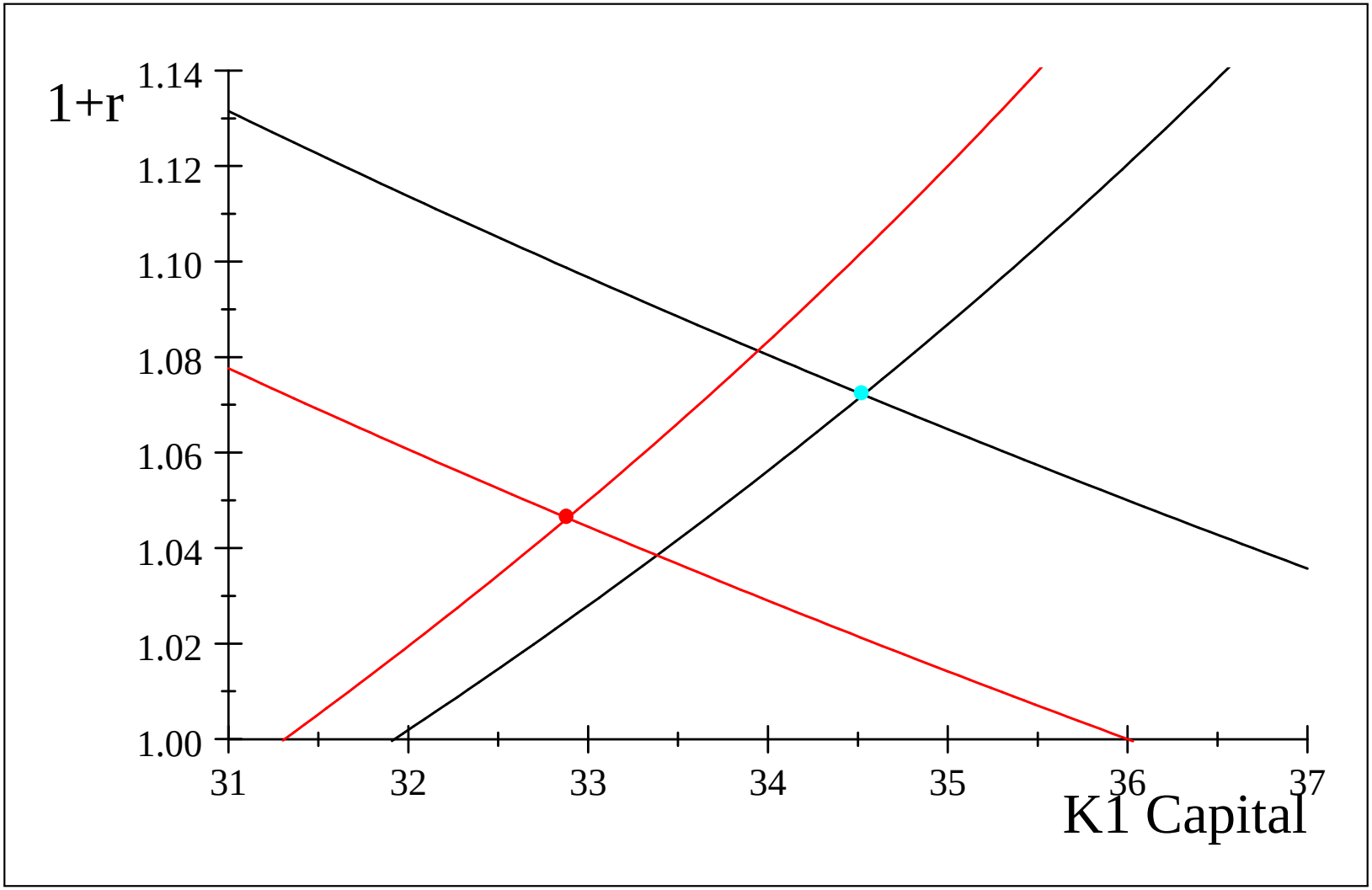


Figure: Capital Market with 5% Increase in Goods Productivity and Income Endowment (Black) versus Baseline (Red).

- **Facts**
  - **Monetary Prices Versus Relative Prices**
  - **Capital to Goods Price & Debt-Deflation**
  - **Stylized Facts Of Cycles**
- **Theory: Ramsey's World with AS-AD**
  - **Ramsey Markets for Output, Labor and Capital**
  - **RBC Analysis: Goods & Time Endowment Changes**
- **Application: Crisis from Fixed Wage**
- **Appendix: Crisis from Bank Productivity Crash.**
- **EconLowdown Module: "The Great Depression 5".**

Figure: US Nominal Price of Goods (CPI) Divided by the Nominal Wage Rate (average weekly wage and salary, full time, 16 and over): P/W, 1979 to 2015

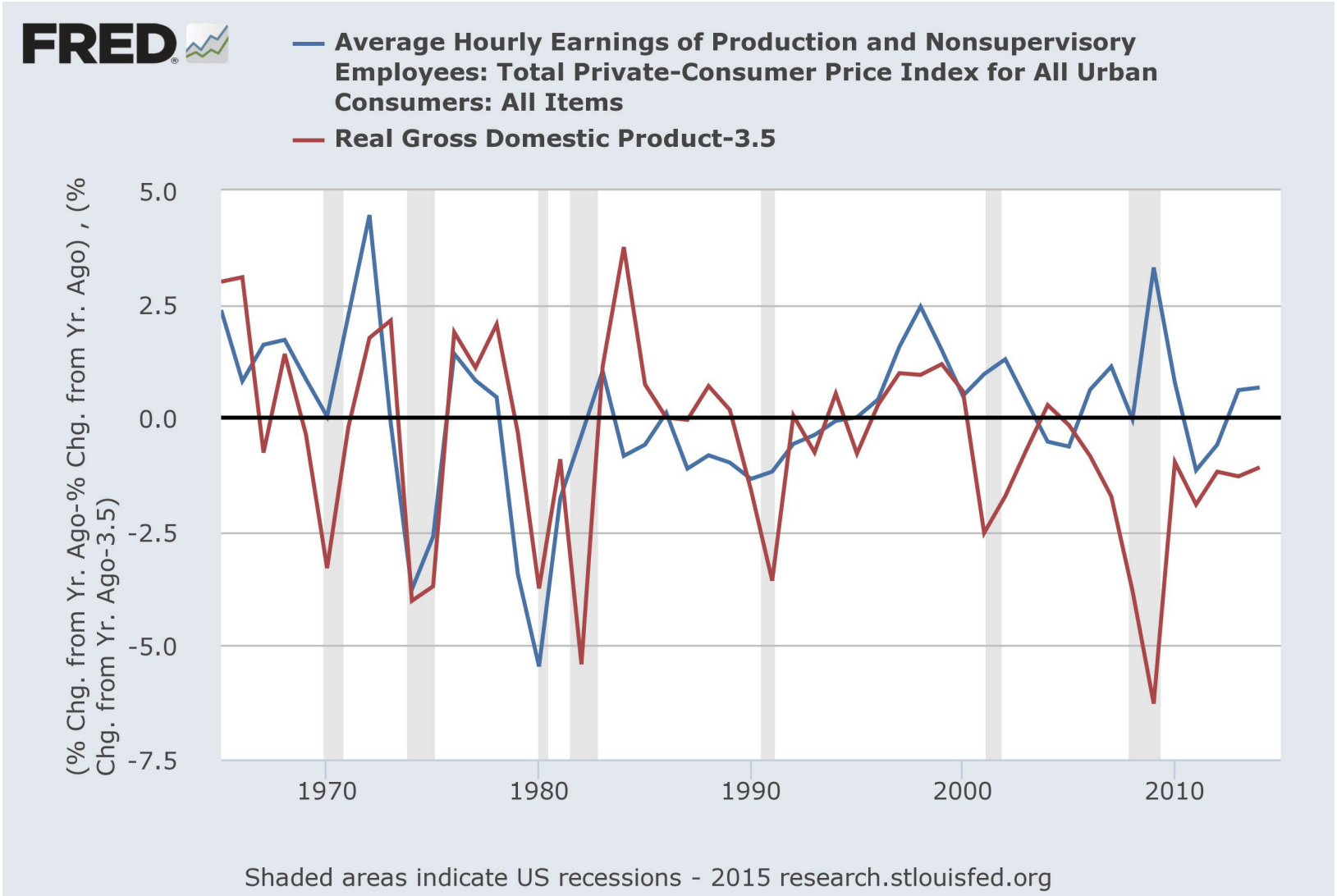


Figure: Annual Growth Rate of Real Wage Rate and Trend-Adjusted Real GDP, US 1965:6-2014.

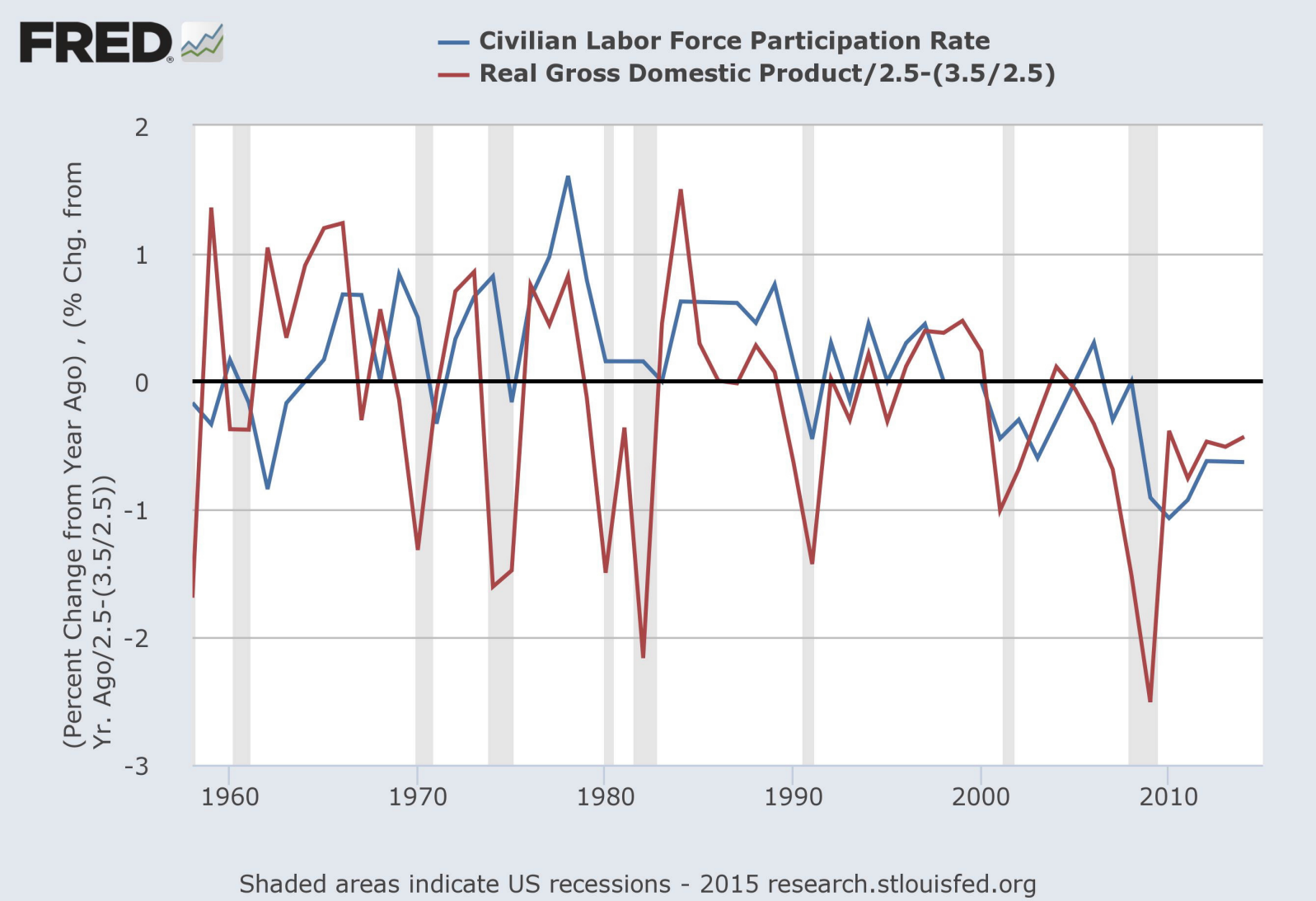


Figure: Annual Average Growth Rates of US Civilian Labor Force Participation Rate, 1957:7-2015.14, (Blue) and Normalized Real GDP (Red).

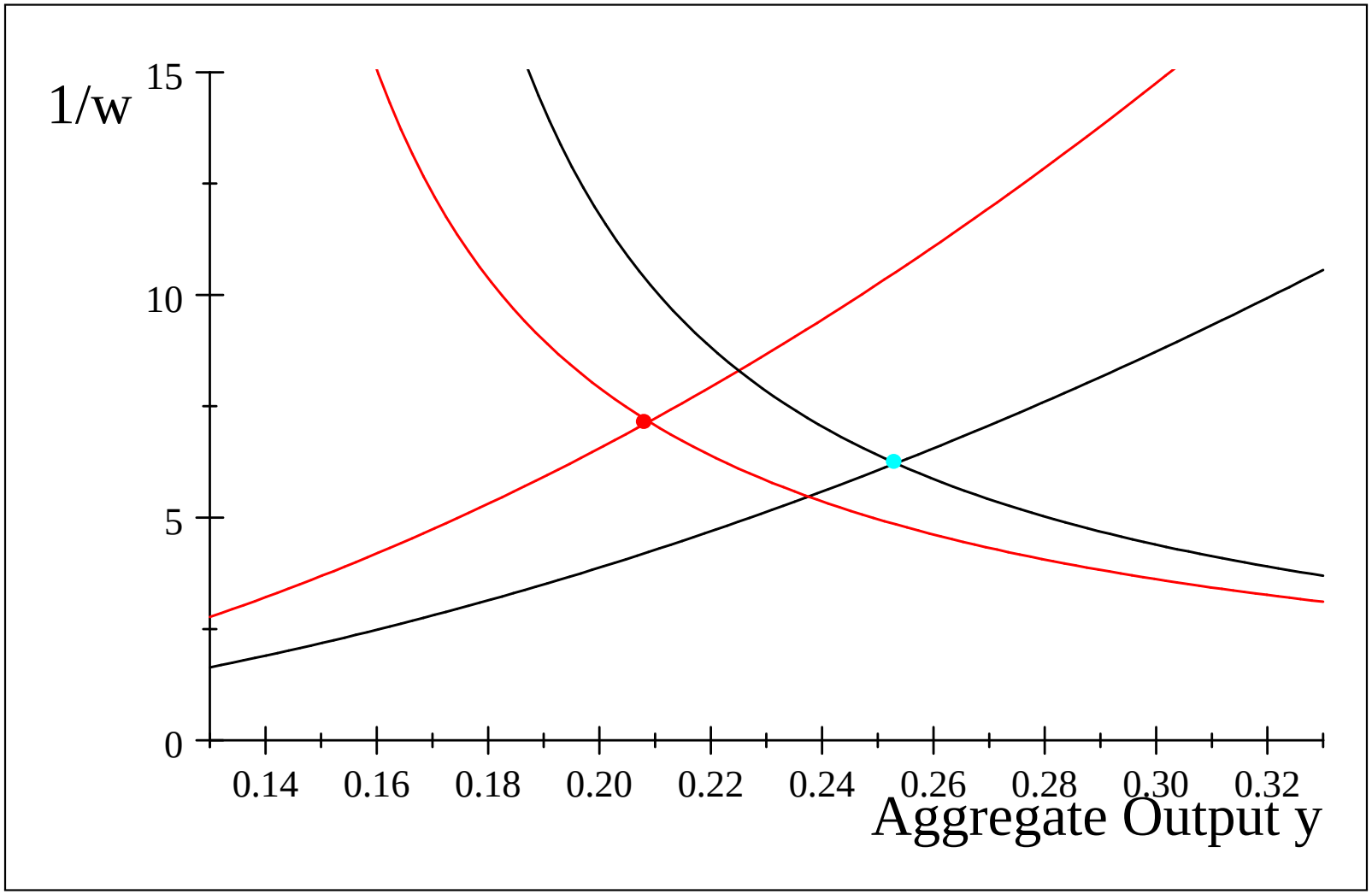


Figure: Business Cycle Expansion in Goods Market: $AS - AD$ Equilibrium with 5% Increase (in Black) in Both Productivity A and Time T as Compared to the Original (in Red).

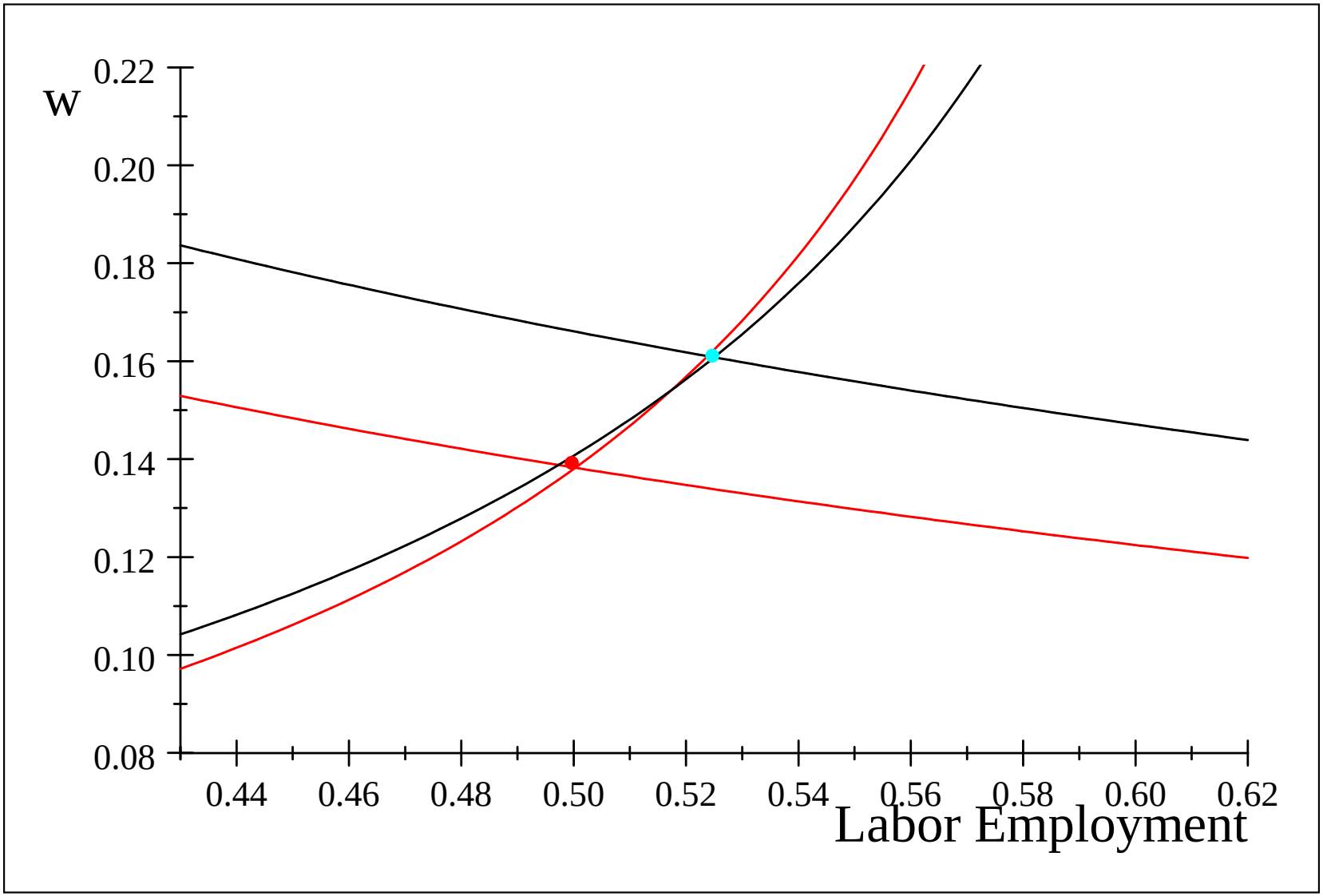


Figure: Business Cycle Expansion: Labor Market has a Shift out in Demand (Black) and Pivoting of Supply (Black) as Compared to Original (Red).

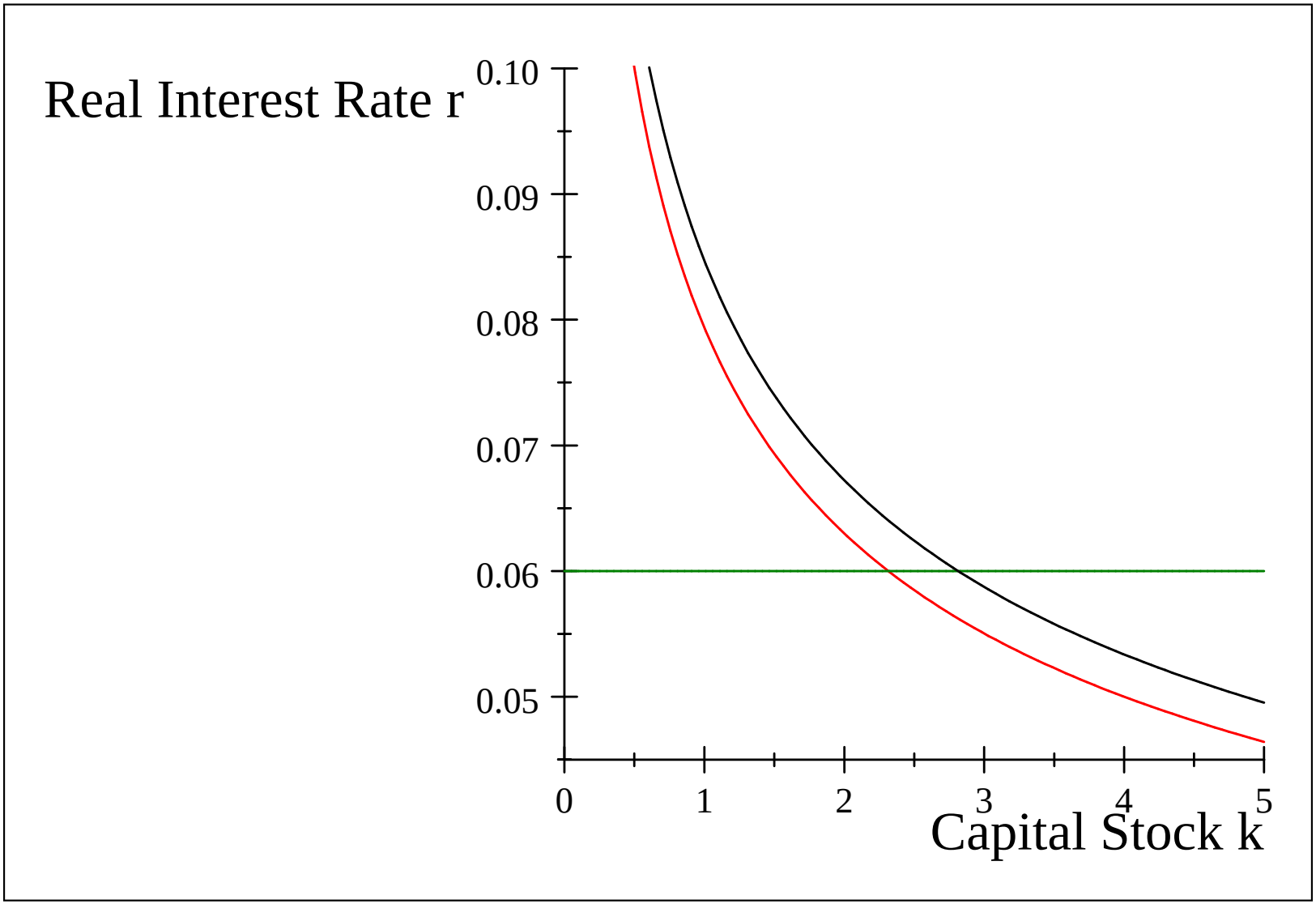


Figure: Capital Market Shows Shift Out of Demand for Capital (Black Curve) When both Factor Productivity A and Time Endowments T Increase by 5% relative to the Original Example Equilibrium (Red Curve).

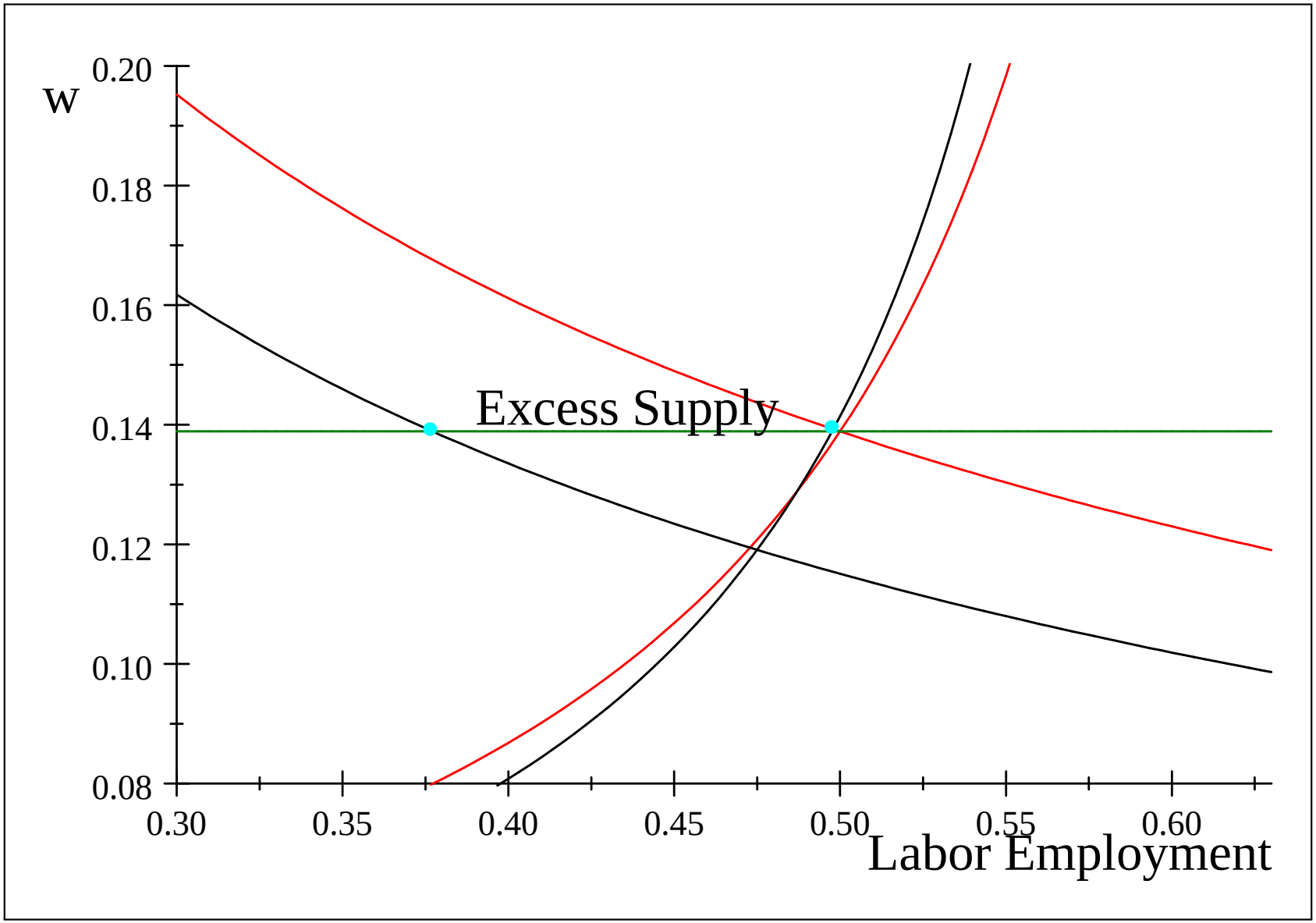


Figure: Excess Labor Supply with a Fixed Wage During Contraction (in Black) relative to the original example equilibrium (in Red).

- Stylized Growth Rate Facts
  - Solow & Solow Plus Growth Facts
- Theory: Growth Puzzle that Solow Solved
  - A Comparative Static Productivity Increase
  - AS-AD with Solow Growth
  - Solow Growth from Ramsey World
  - AS-AD with Continual Technological Progress
- Application: Trend Down in Time
- Appendix: Growth with Human Capital
- EconLowdown Module ""Economic Growth".

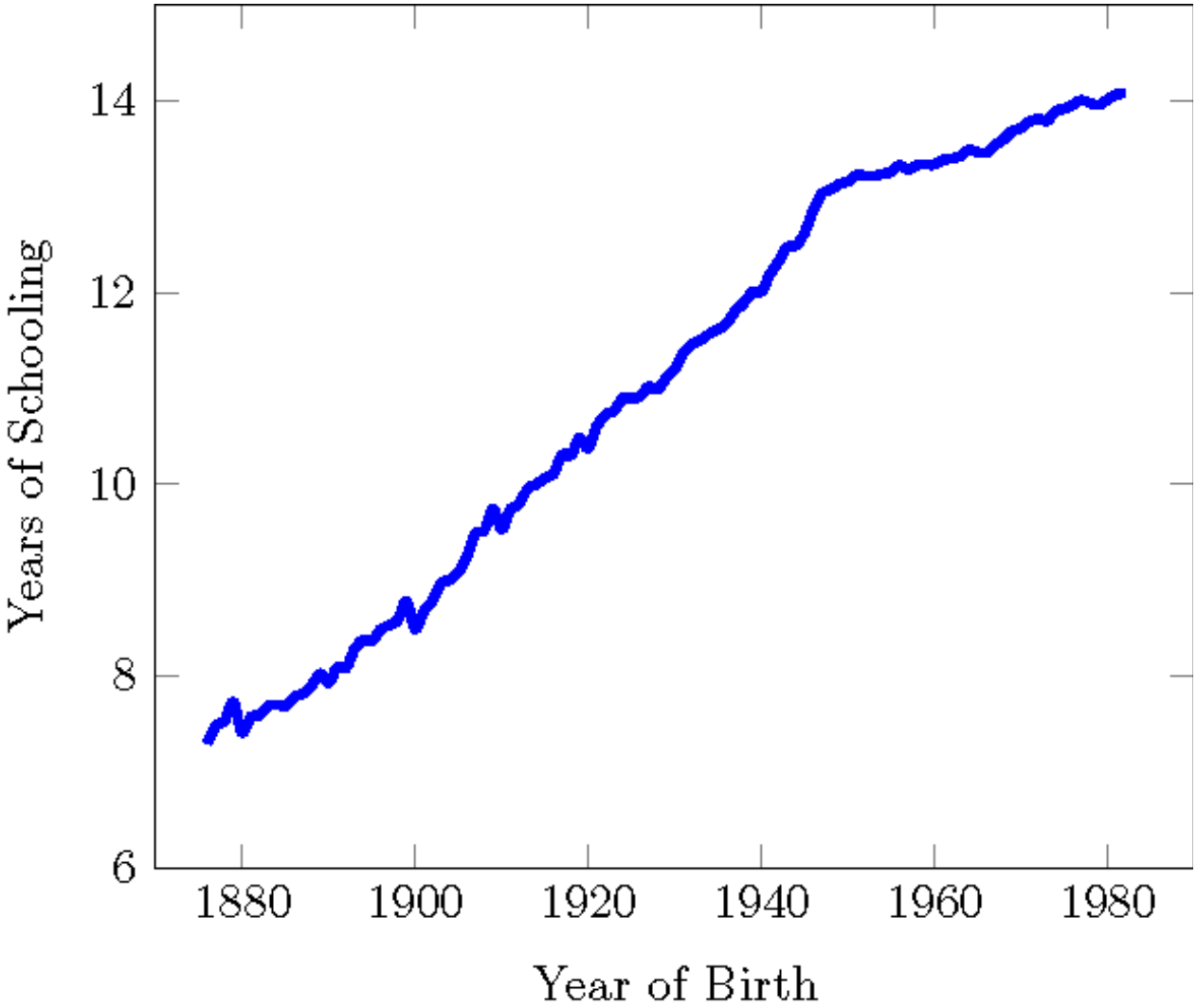


Figure: US Years of Education by Birth Cohort

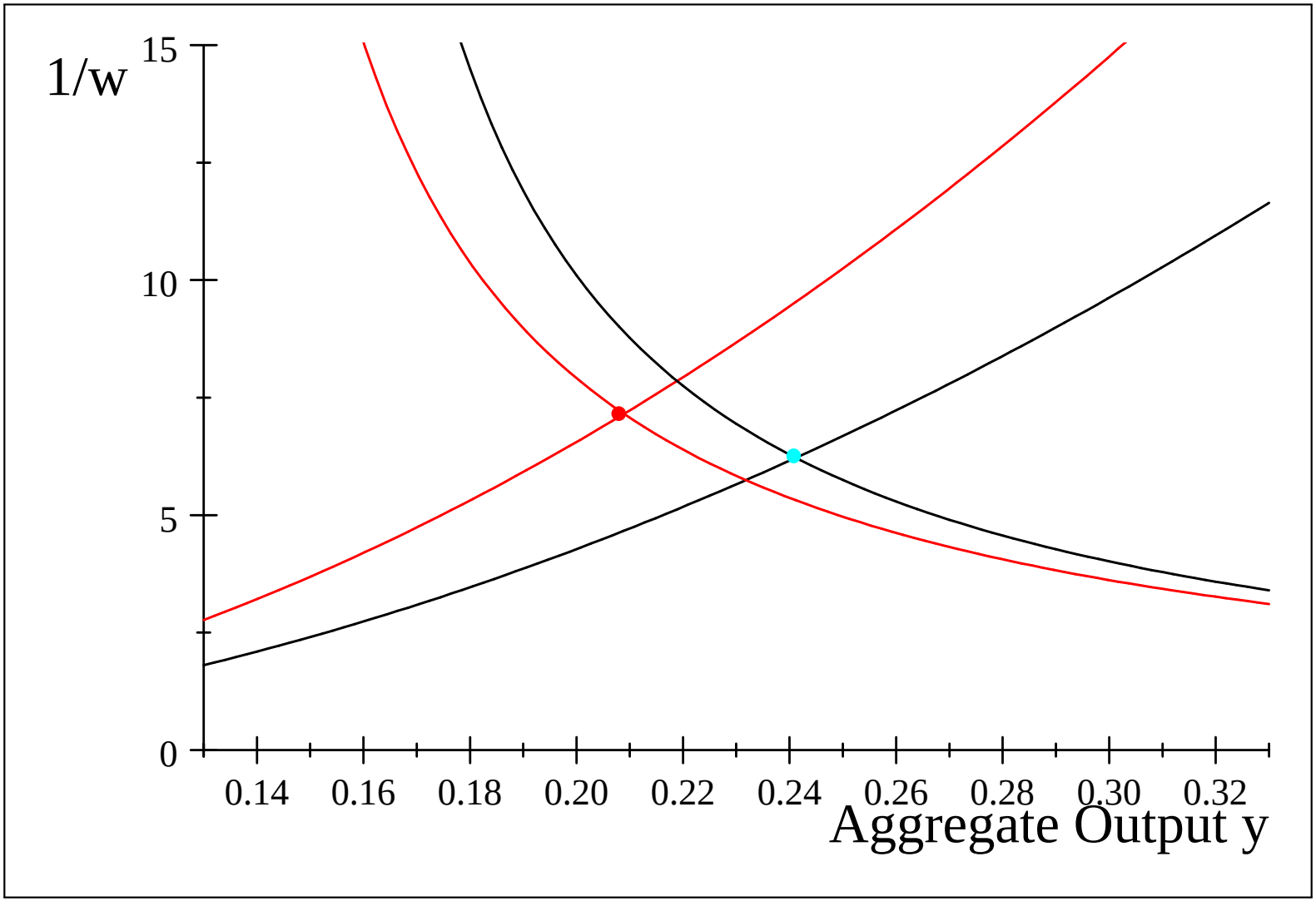


Figure: *AS* – *AD* Equilibrium with Goods Productivity Increase (in Black) as Compared to the Original (in Red).

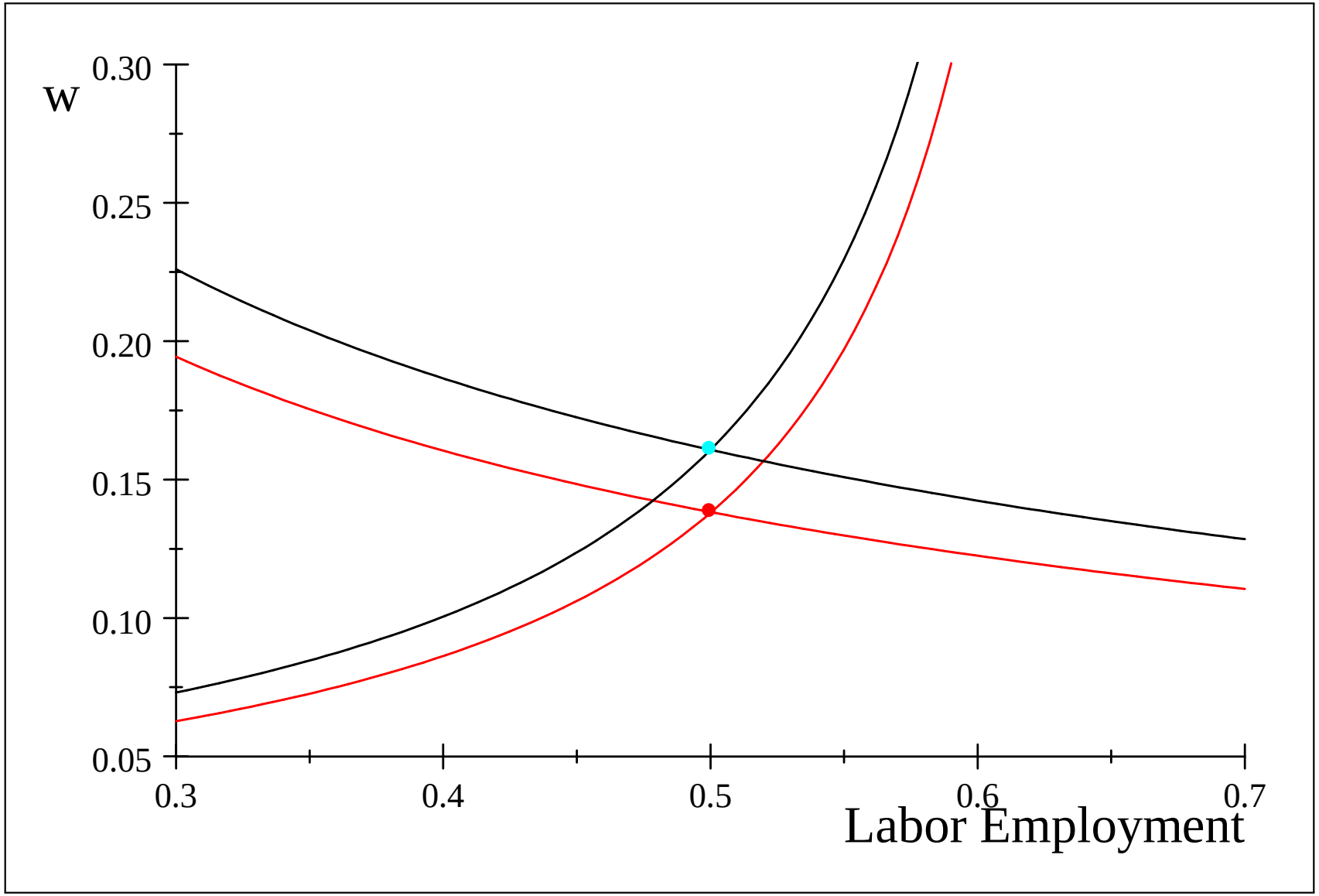


Figure: Increase in Productivity (Black Curves) Raises w and Leaves Employment Unchanged.

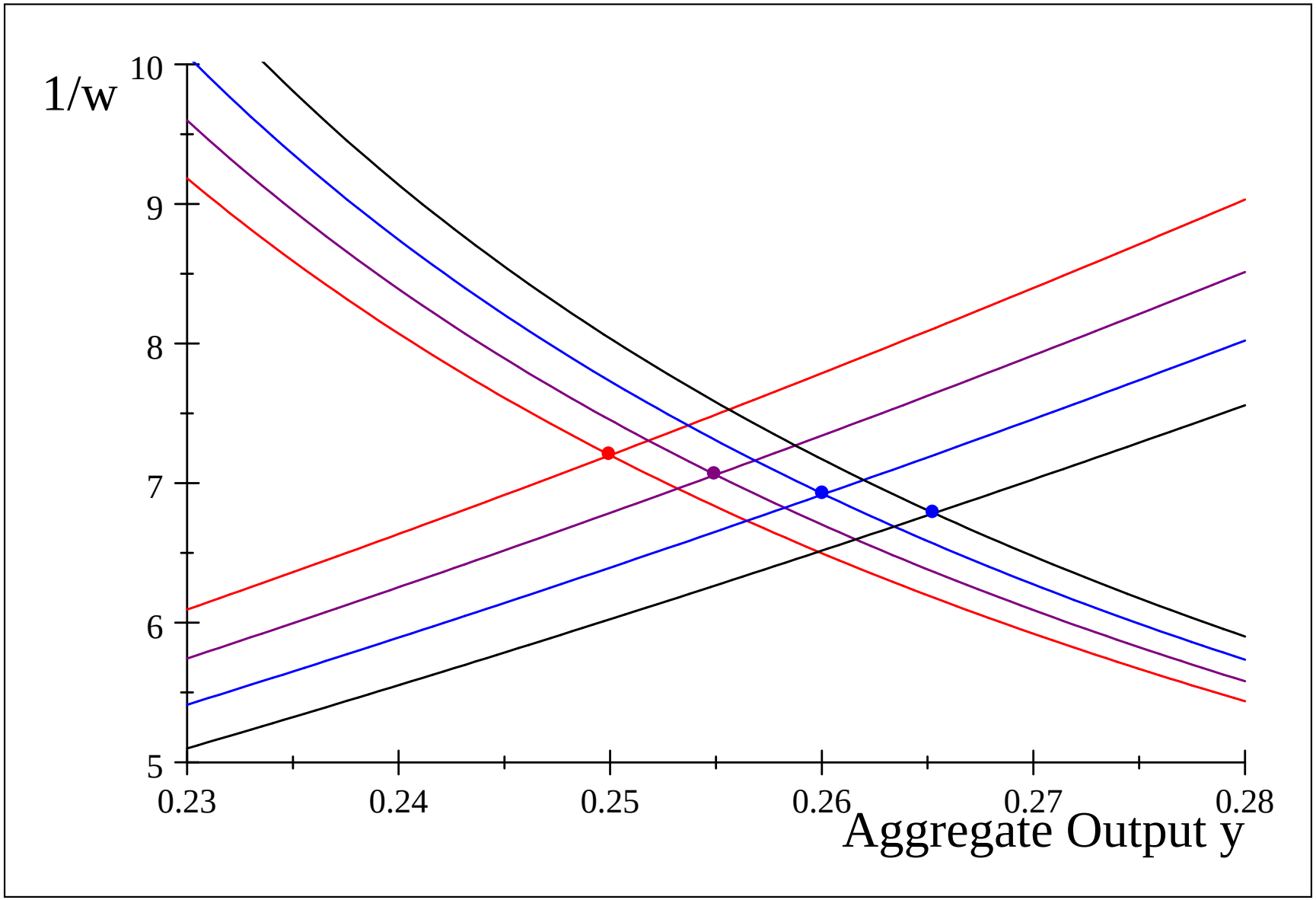


Figure: $AS - AD$ Equilibria Over Time With 2% Exogenous Growth Example; Moving From Red to Black Curves over 4 years.

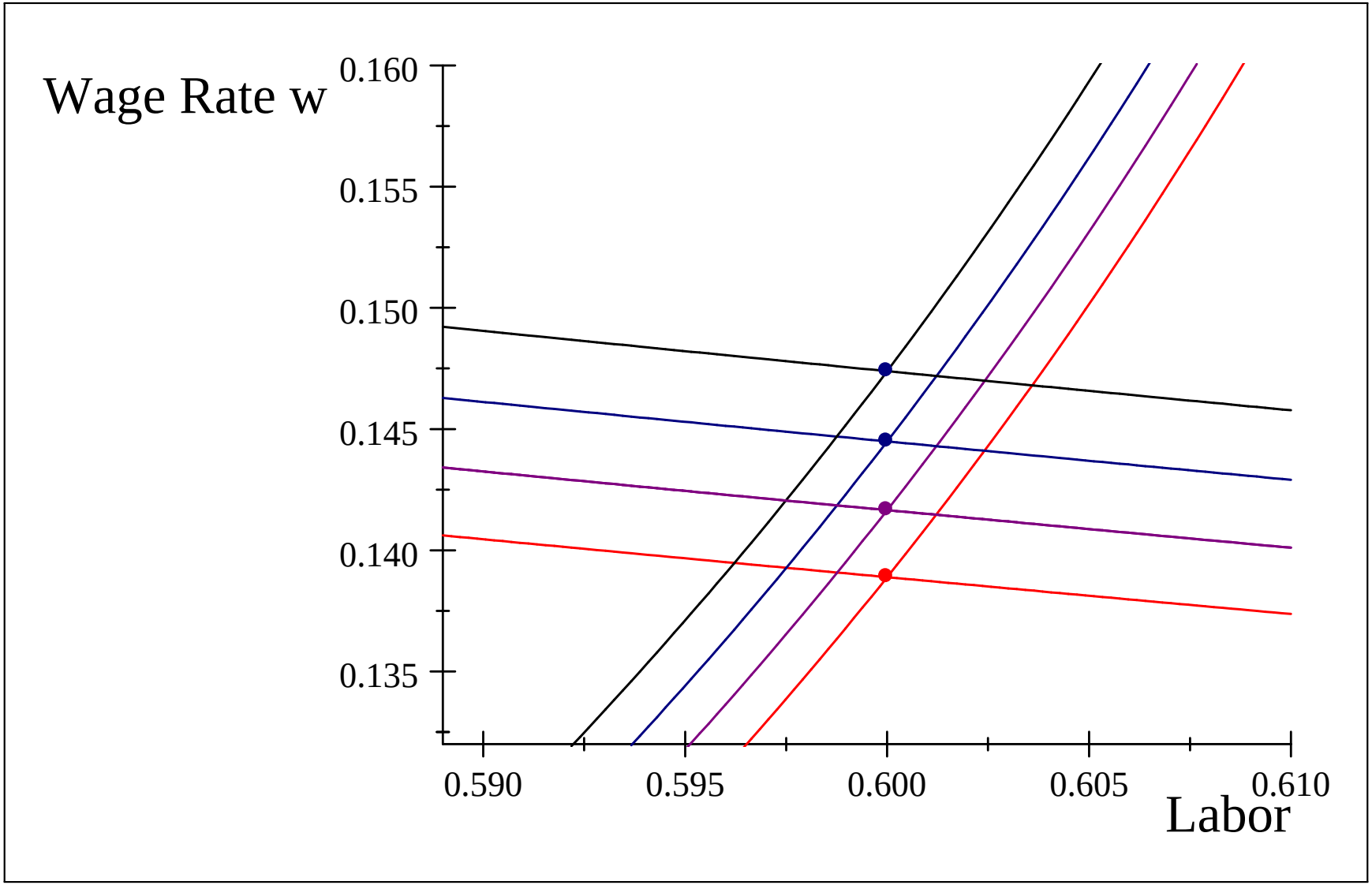


Figure: Labor Market with 2% Exogenous Growth and Rising Real Wage, Constant Employment, Over Time.

Policy as Social Insurance

Policy

- **Facts: British and American "Welfare States"**
- **Theory: Moral Hazard Danger of Social Insurance**
  - **Inequality and Consumption**
  - **Permanent Income Consumption**
  - **Ramsey World's Keynesian Cross**
  - **Spanning Keynesian & Friedman Consumption**
  - **Social Insurance Examples**
- **Application: FDIC Post-2010 Dodd-Frank**
- **Appendix: Taxes, Public Goods, Insurance**
- **EconLowdown Modules "Government Budgets" & "Fiscal Policy".**

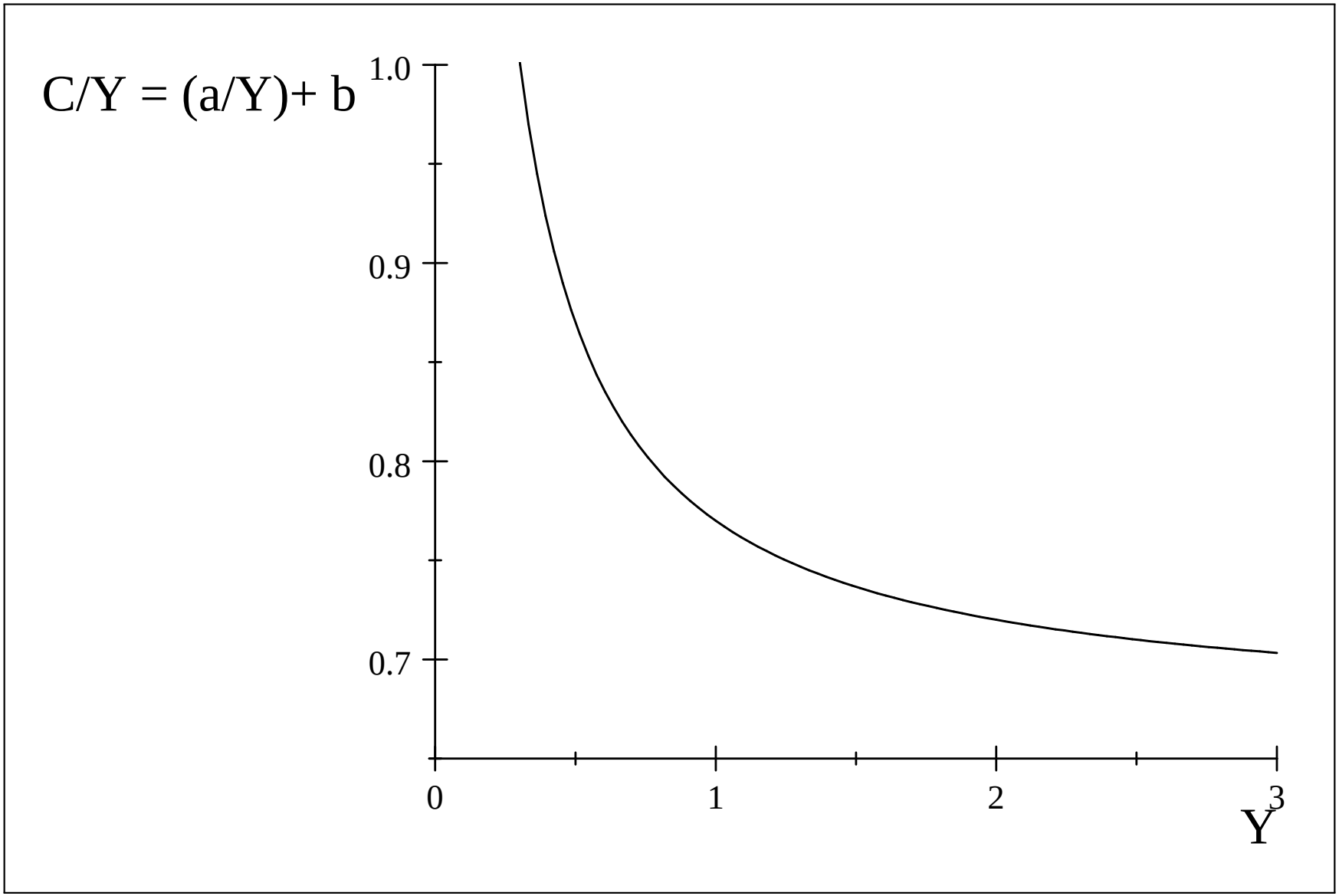


Figure: Consumption as a Fraction of Income: in the Keynesian Theory of Consumption $C = a + bY$.

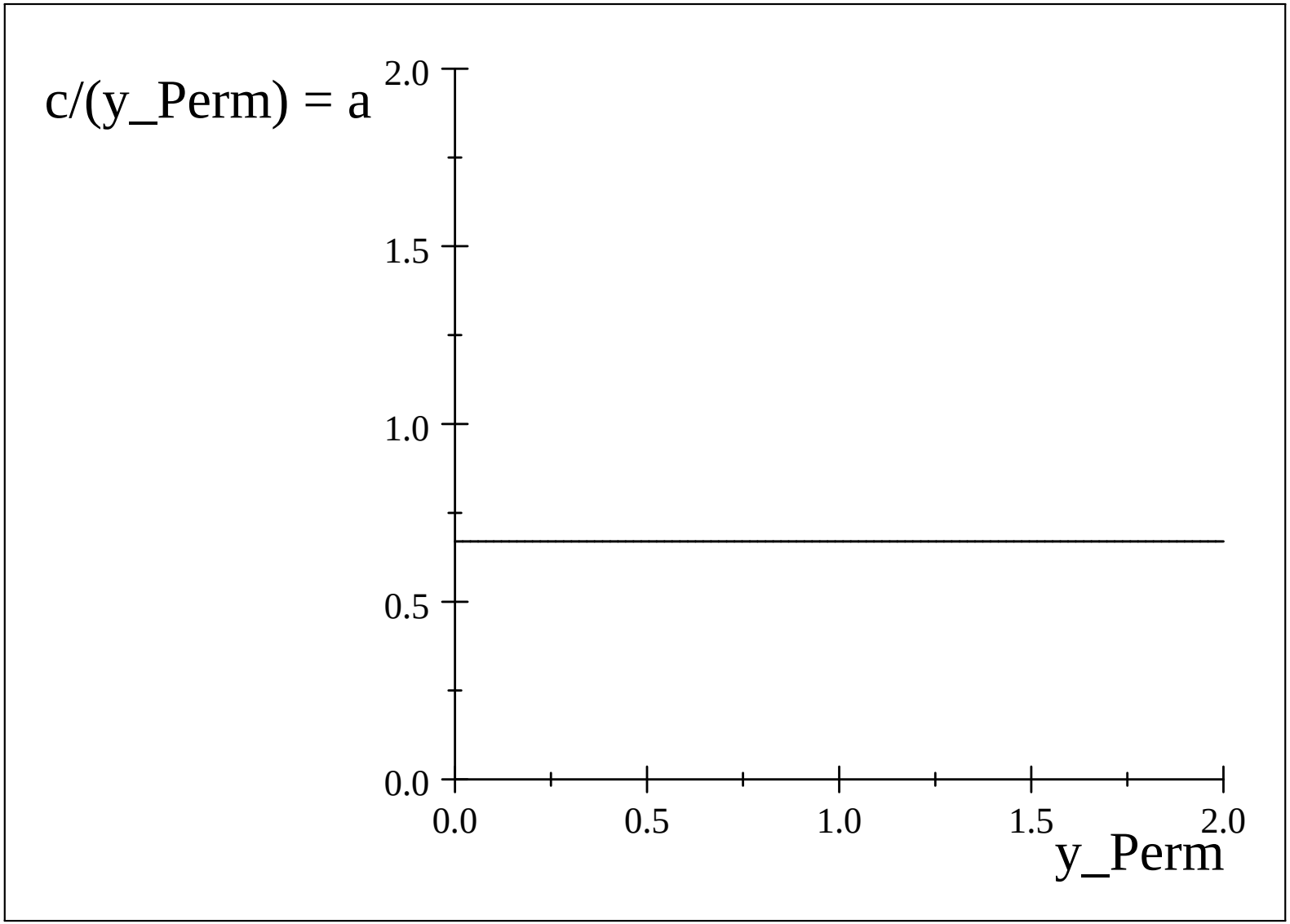


Figure: Consumption as a Fraction of Permanent Income: Ramsey-Friedman Theory

"Ramsey Cross"

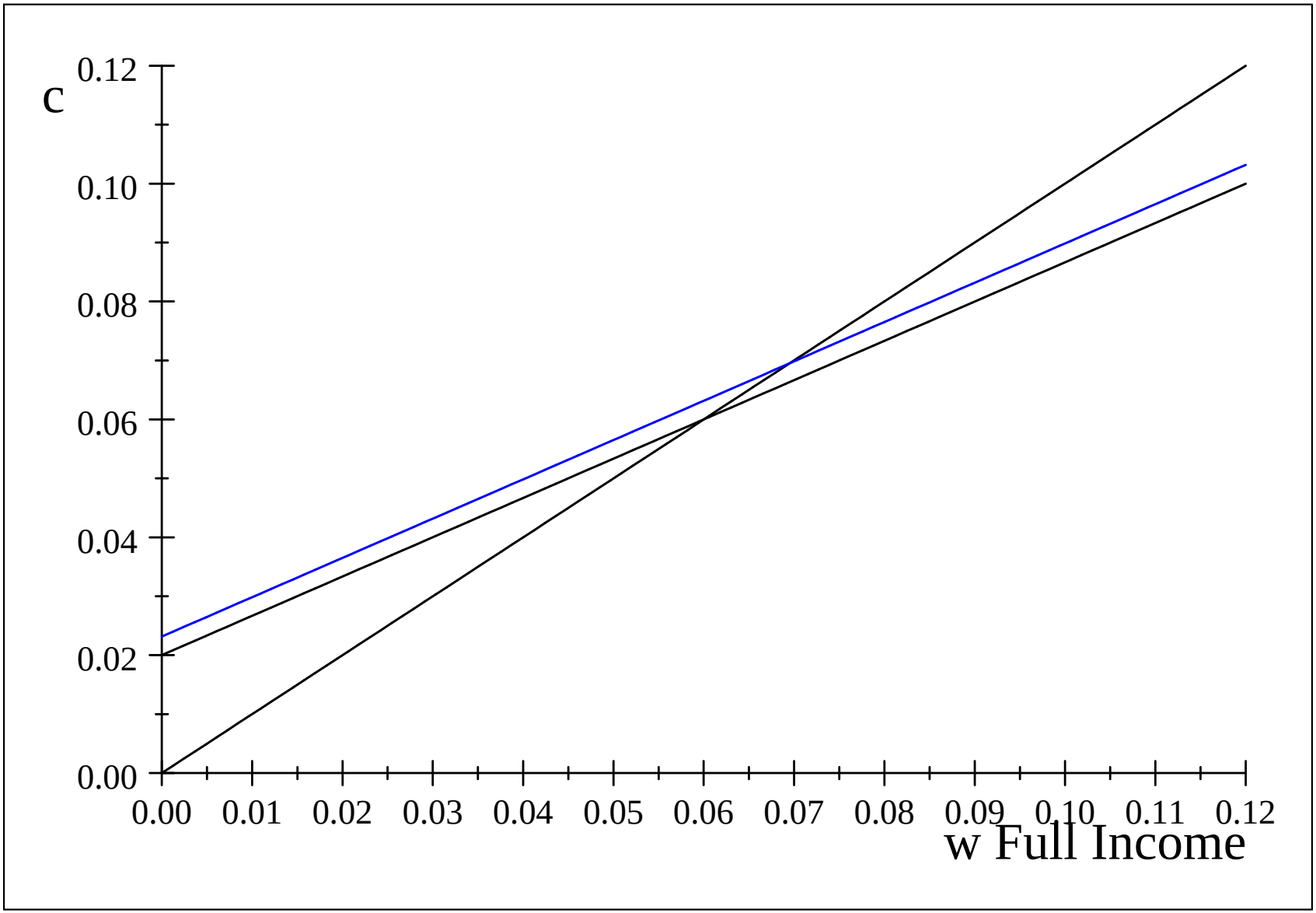


Figure: Ramsey Consumption Theory and Busines Cycles: Increase in A

- **Facts: Fed "Bailout" of US Bank System?**
- **Theory: Bagehot's law of financial efficiency**
  - **Tax on Capital Markets, Welfare Loss,**
  - **Financial "Repression"**
  - **Seeking Yield": Capital Market Distortion**
  - **Government Capital Flooding**
  - **Internationally Inefficient Bank Subsidization**
  - **Deconstructing 3-Equation Keynesian Bank Model**
- **Application: Normalizing Policy**
- **Appendix: Being Earnest on Banking**
- **EconLowdown Module "The Great Depression 6".**

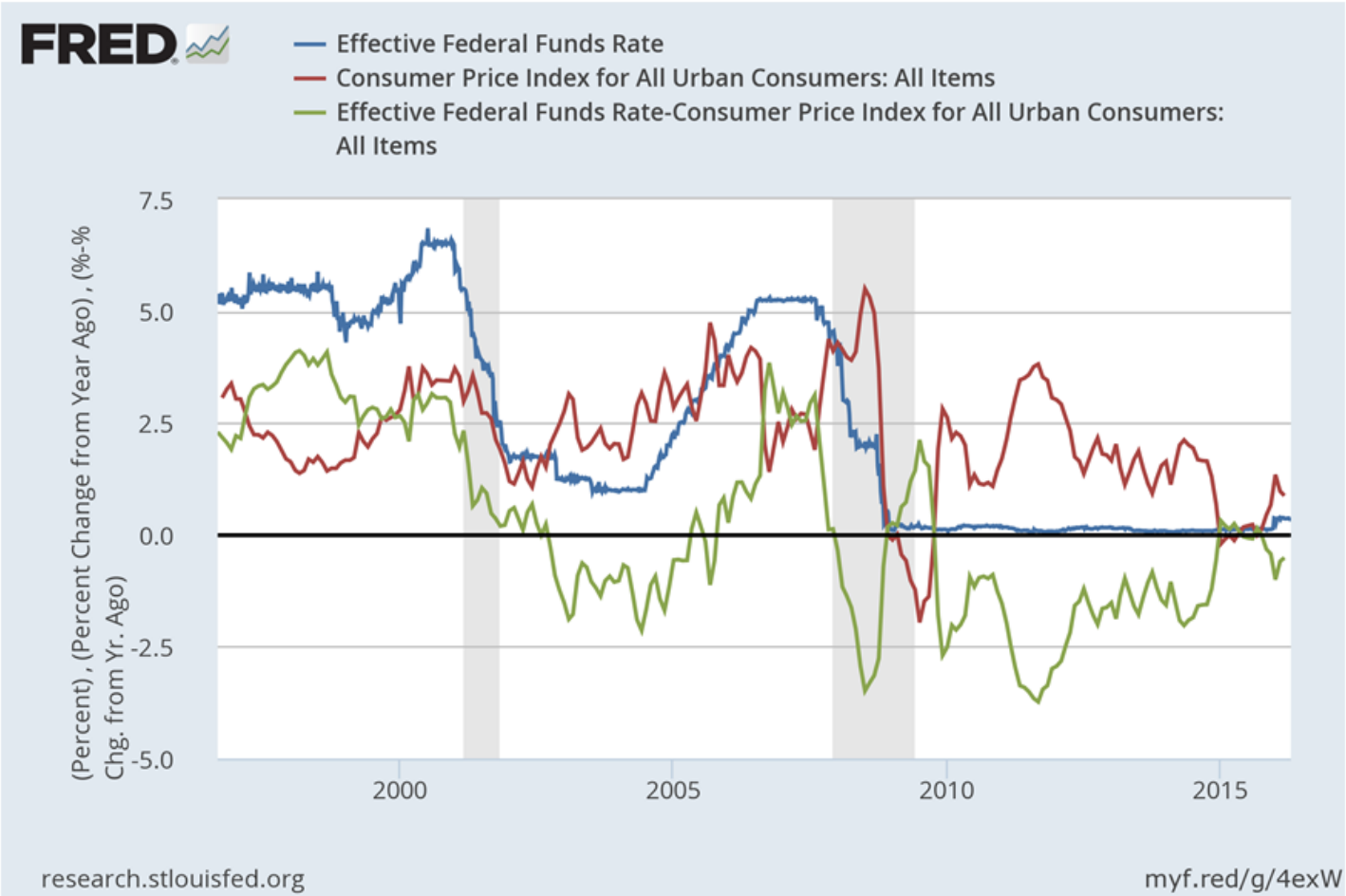
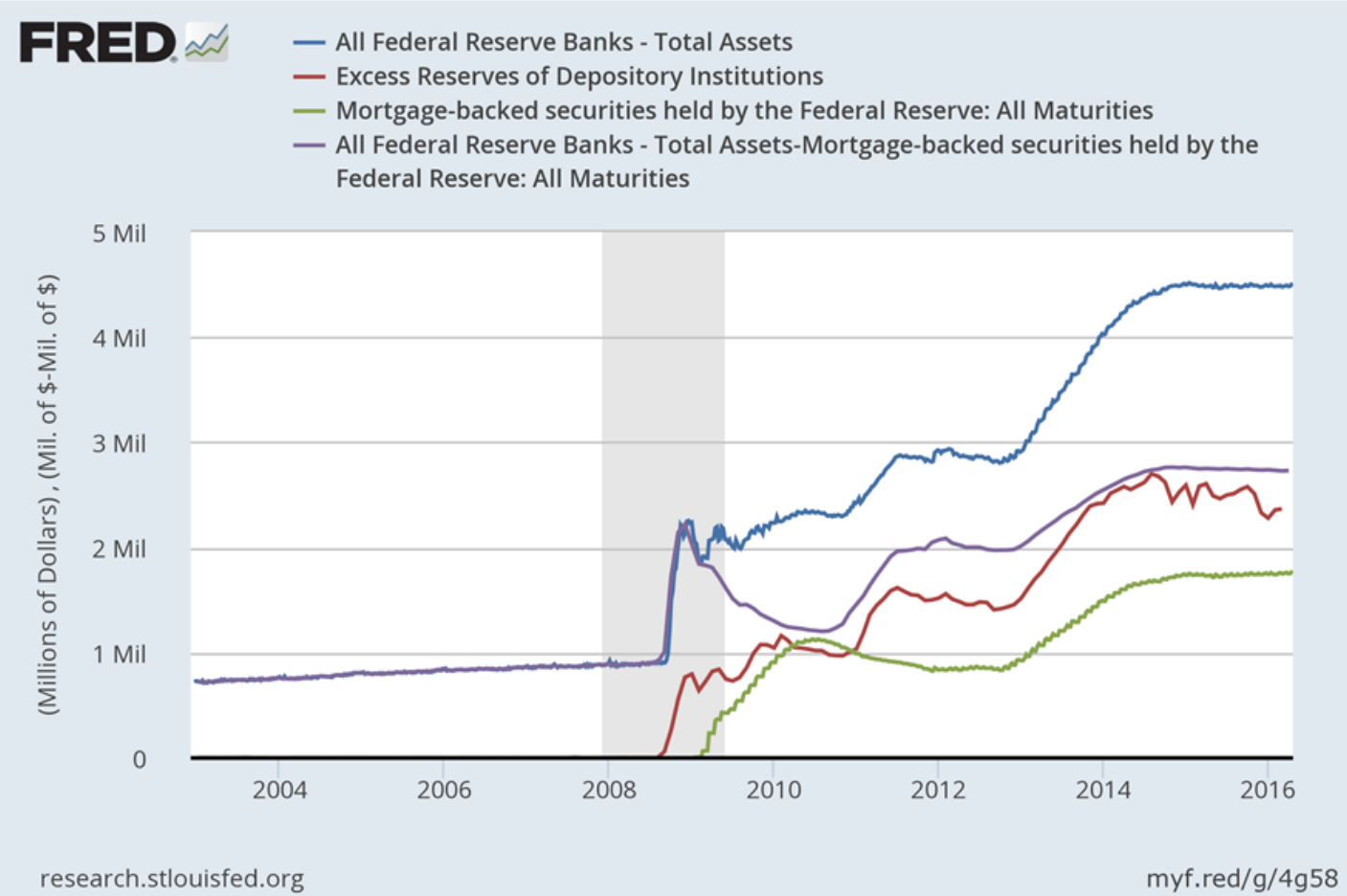


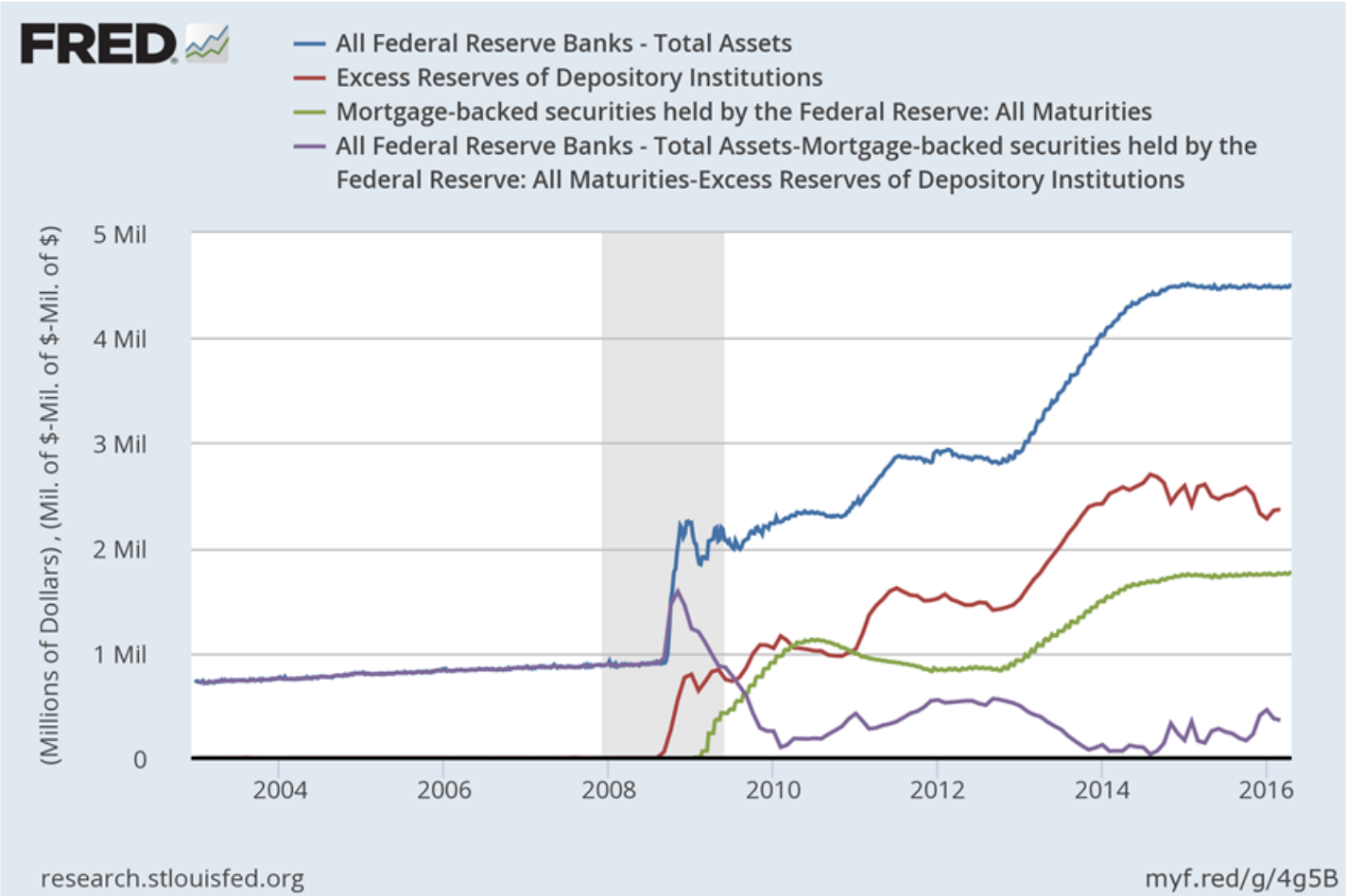
Figure: Great Recession and Post 9/11 Negative Real Interest Rates (Green) vs. FFR (Blue) and CPI inflation at a monthly frequency (Red).

Fed Caused Lost Decade?

Purple line (Total Assets) - (MBS) follows Red (Excess Reserves)



Fed's Assets Minus MBS & Excess Res.= 0



Interest on Excess Reserves Forces Down Real Interest Rt.

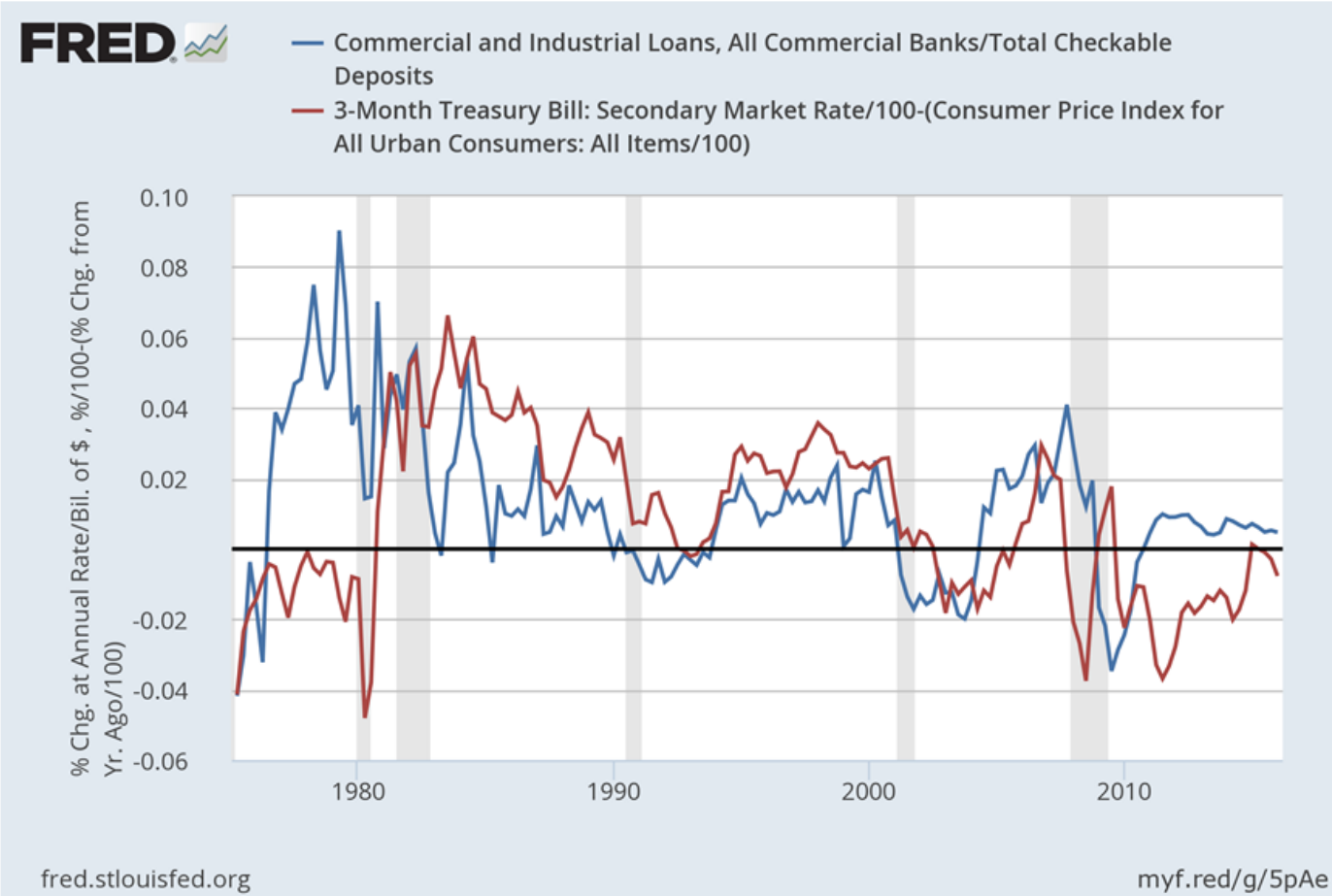


Figure: Loan Ratio (Blue) & Real Int Rt (Red)

Figure: Loan to Demand Deposit Ratios: Consumer Loans Ratio in Red; Commercial and Industrial Loans Ratio in Blue.

When Effective Ceiling Imposed On Real Interest Rate

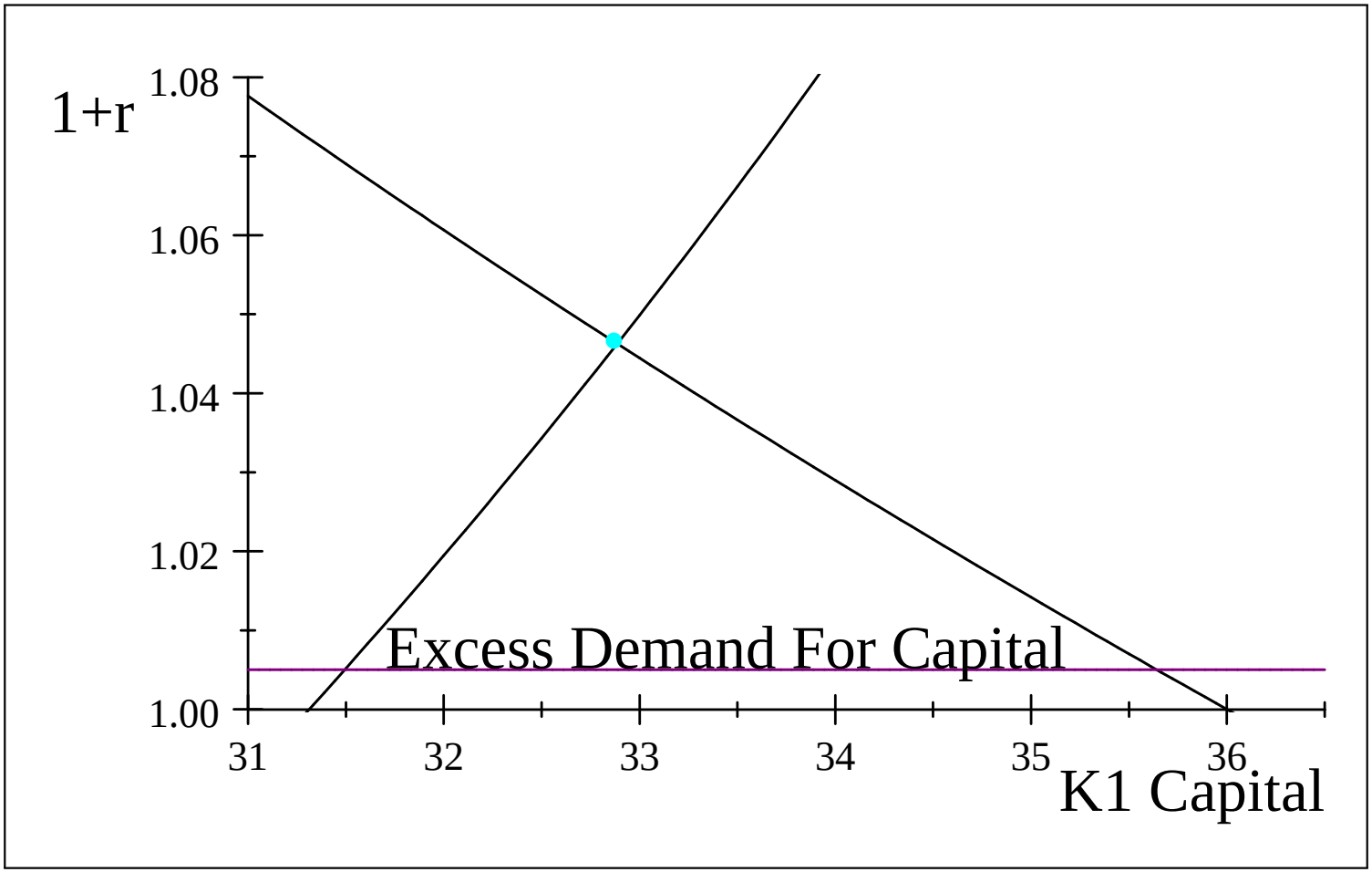
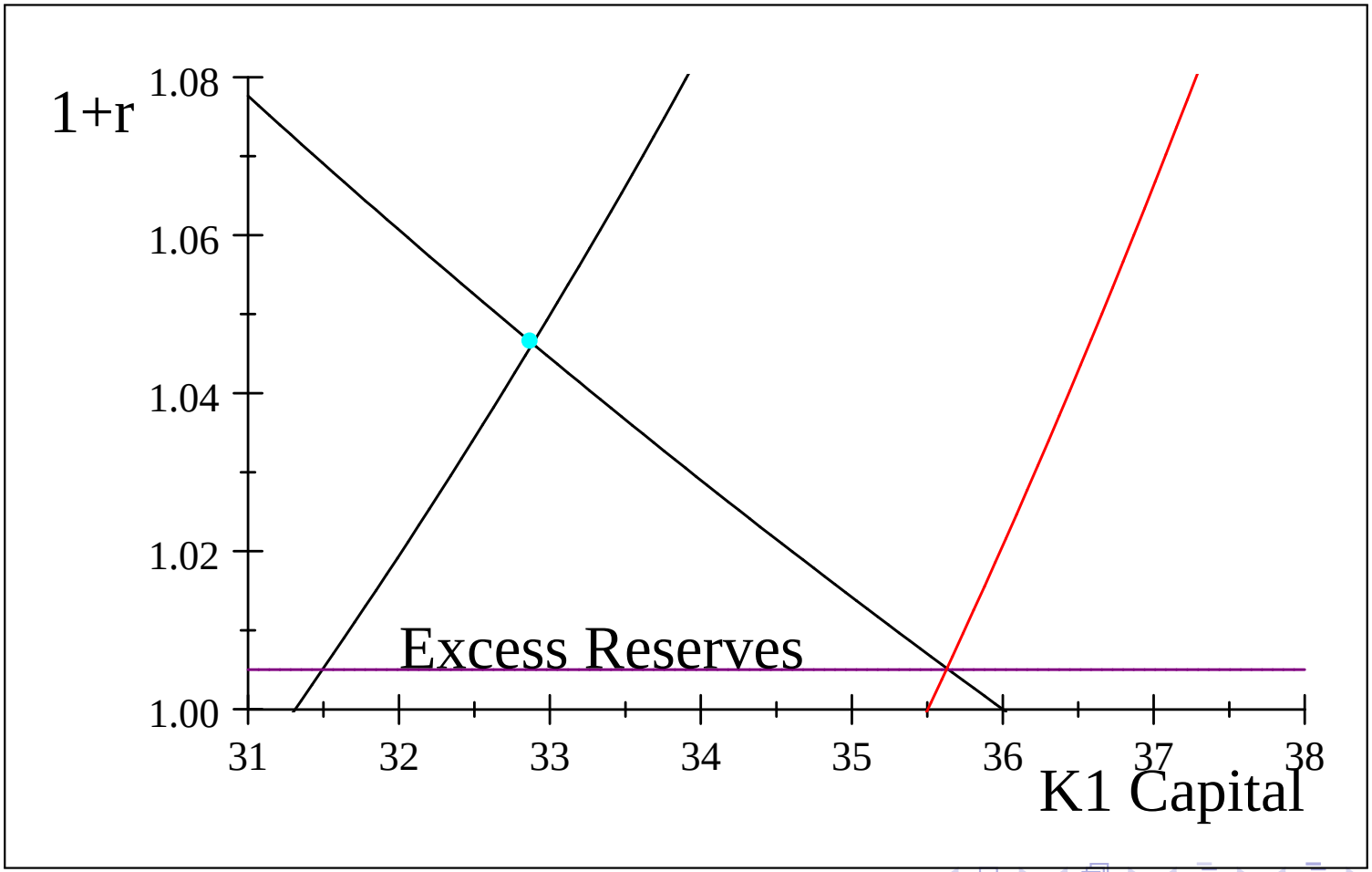


Figure: Savings and Investment: Aggregate Supply and Demand for Capital k With Real Interest Rate Ceiling

Fed's Shift out of Supply of Capital through the Open Market Purchases of US Treasury or Treasury backed Securities: Creating the Bank System's Excess Reserves .

"Excess Reserves" That Fed Supplied Buying Treas Debt



Capital Tax Wedge on Priv Invest. with High r for Investment

Low r for Savings: Dead Weight Triangle Loss of Welfare

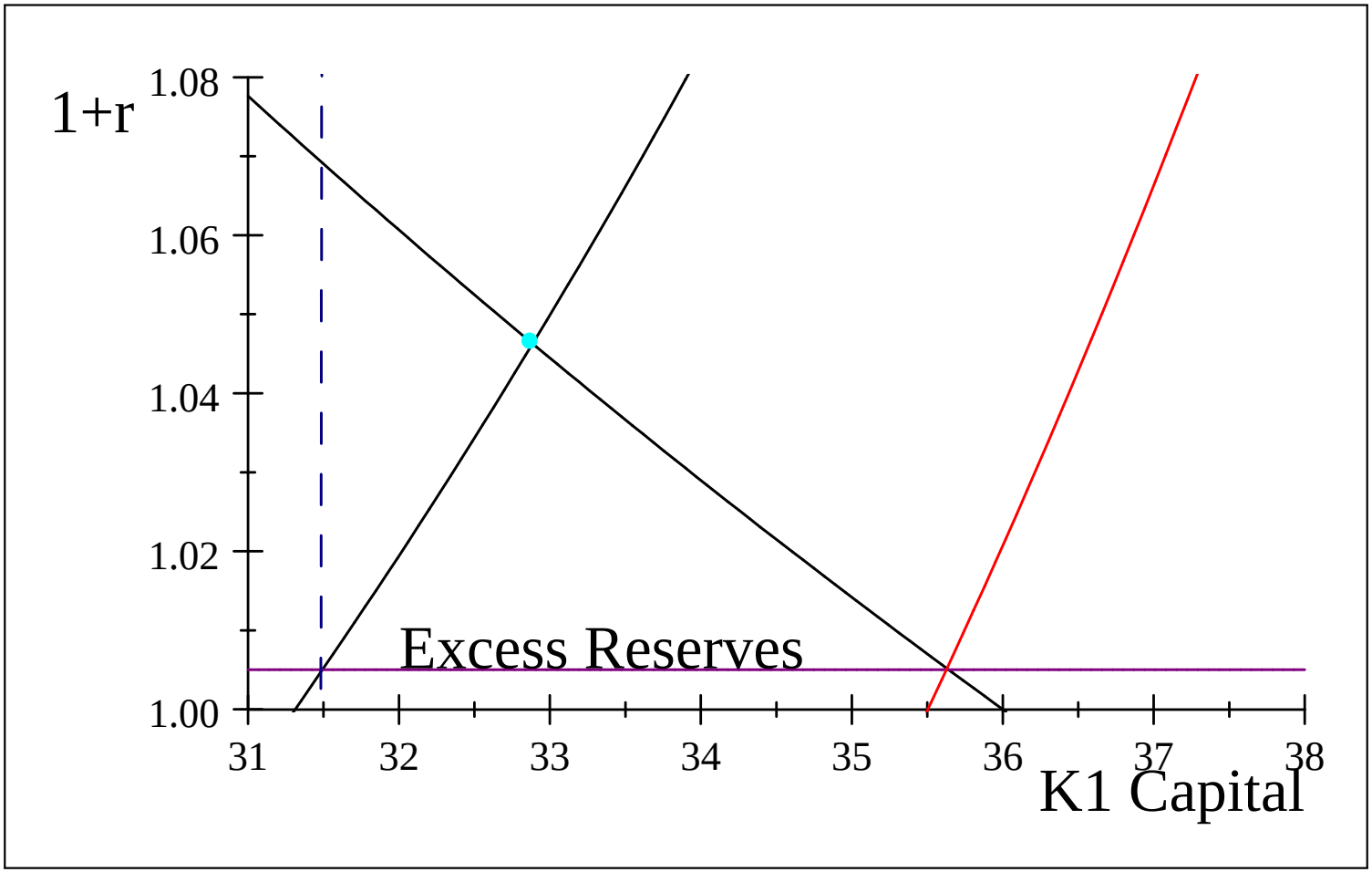


Figure: "Deadweight Loss Triangle"

View of Wedge in Gen Equil CCAPM

Brown Indiff Curve CUTS Prod Funct at Low Diversification Level

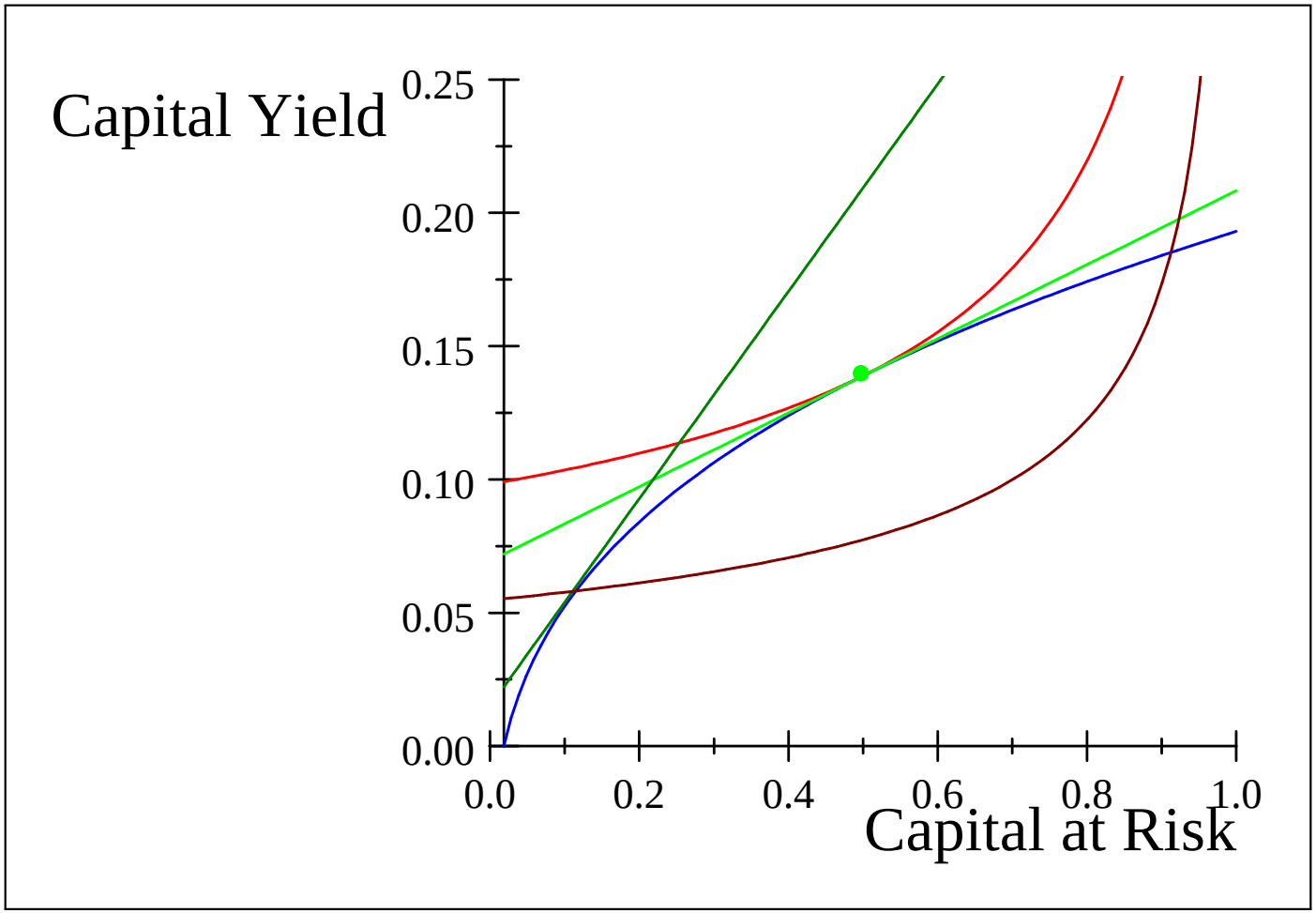


Figure: Optimal Portfolio Diversification between Market Portfolio (Tangency) and "Risk-free" Government Debt.

Economy's Python Digestion of Prickly Problem

Porcupine Eaten?: Prickly Future Inflation

Figure: US Economy's Python