

The Aggregate Supply/Aggregate Demand Model



... and now that we have some data, we divert into the modeling section of the course. This will give us a framework for analysis.

Reminders ...

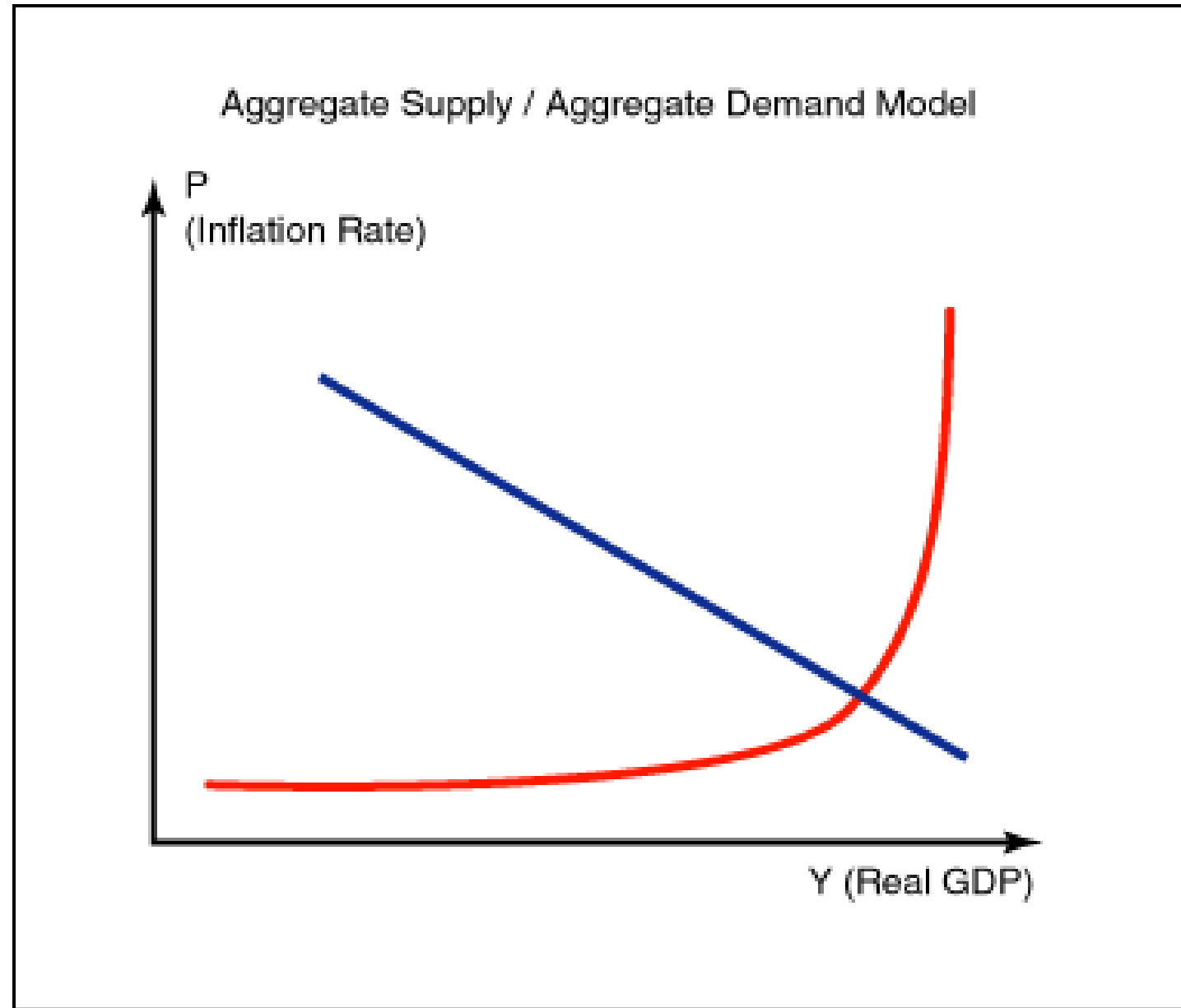
1. Remember to check the course calendar for the smaller assignments: (Don't forget this)

2	January 28 & 30	<p><i>Business Cycles</i></p> <p>Download and read the Business Cycle Essay. Download and read pages 1-15 (required) Financial Health of Young America. Young Invincibles, January 2017 (the second half is recommended).</p>
3	February 4 & 6	<p><i>The Aggregate Supply/Aggregate Demand Model</i></p> <p>Download and read Chapter 1 - Economic Models. Download and read Chapter 2 - The Aggregate Supply/Aggregate Demand Model.</p> <p>Then if you are curious about why we do not use a textbook, listen to this <i>NPR Podcast</i> Why Textbook Prices Keep Climbing, September 16, 2016.</p>

(read this background chapter ASAP)

(optional)

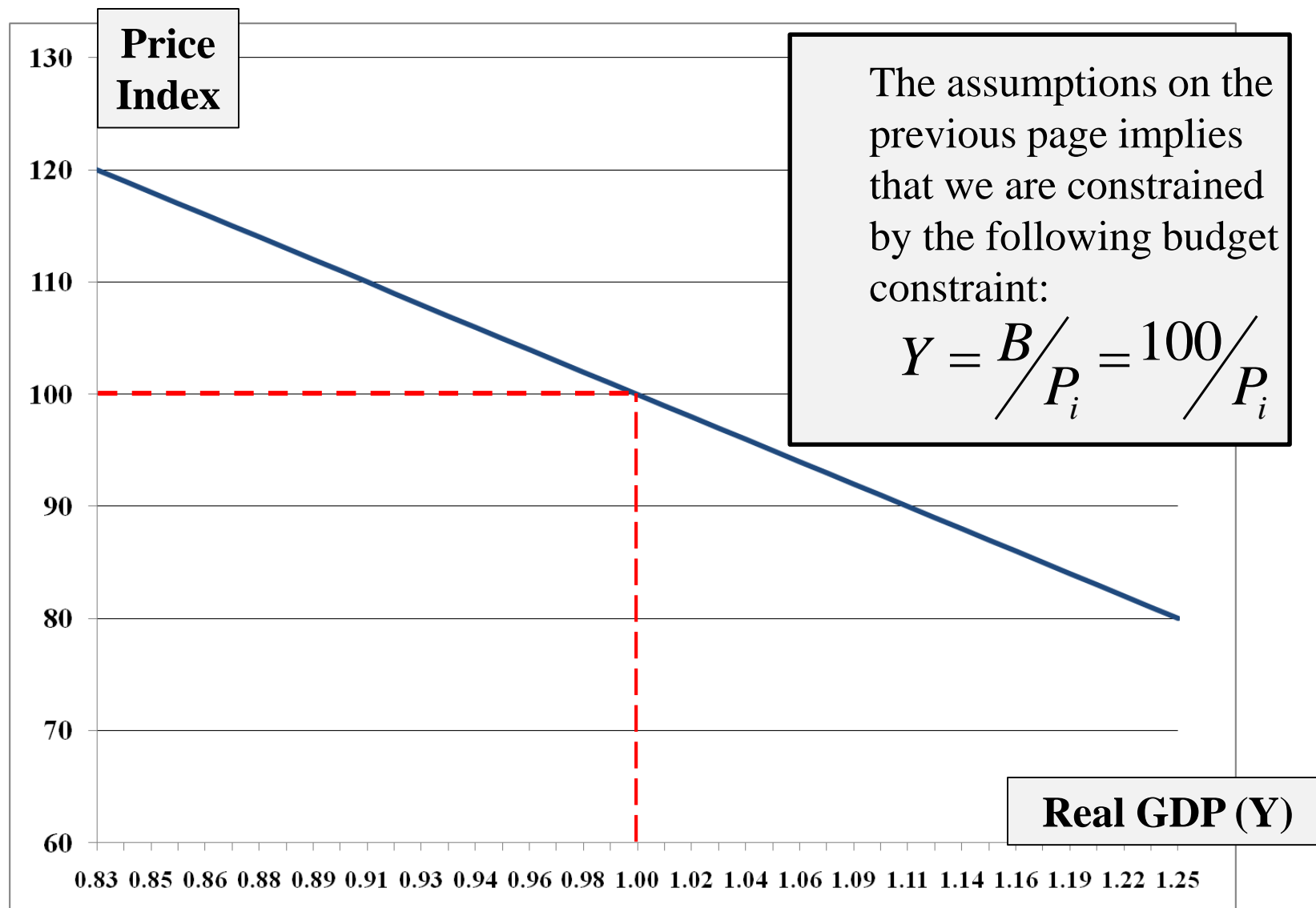
2. Remember that the third business cycle lecture is video only (mandatory)
3. The lecture that covers chapter 1 (Economic Models) is also video only, but may be seen out of sequence – it is merely and oral affirmation of what the chapter covers.



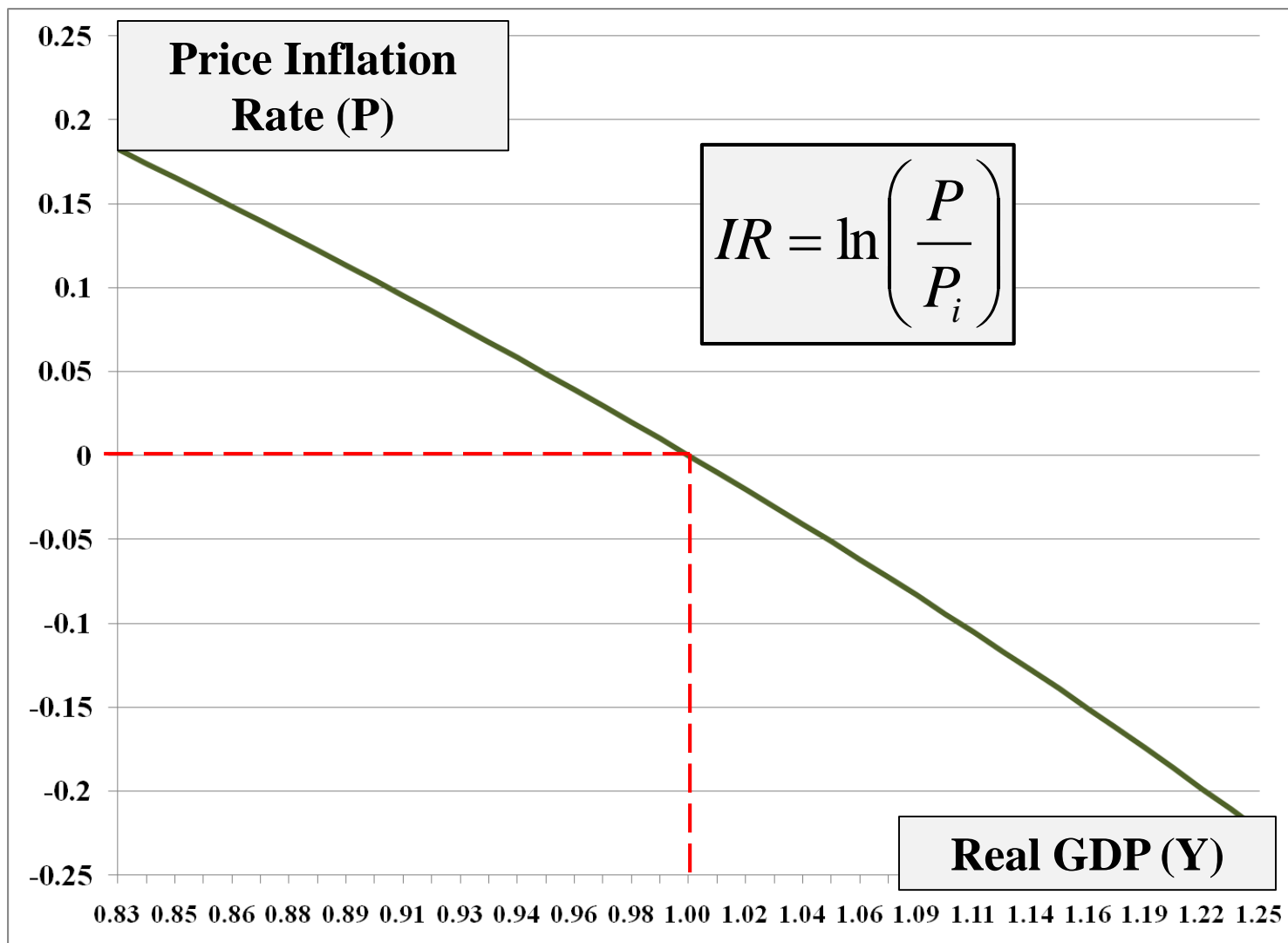
Justifying the Demand Curve: Assumptions

1. Start with a “steady-state” equilibrium economy (then shock it later)
2. Primal source of *nominal* aggregate demand is *nominal* national income earned in the previous period. This prior income becomes our budget constraint (B) in the current period.
3. Nominal national income earned in the previous period equaled nominal GDP in the previous period, which in turn equaled Real GDP (Y) times the Price Level in that period.
4. In this period we have normalized that price level to a Price Index (P_i) with a base of 100.
5. In this period we also normalize the Real GDP level to 1 (maybe that represents \$100 billion).
6. The two assumptions above, given that we are at steady state, implies that our nominal budget constraint is 100, which is equal to the current price index times Real GDP.

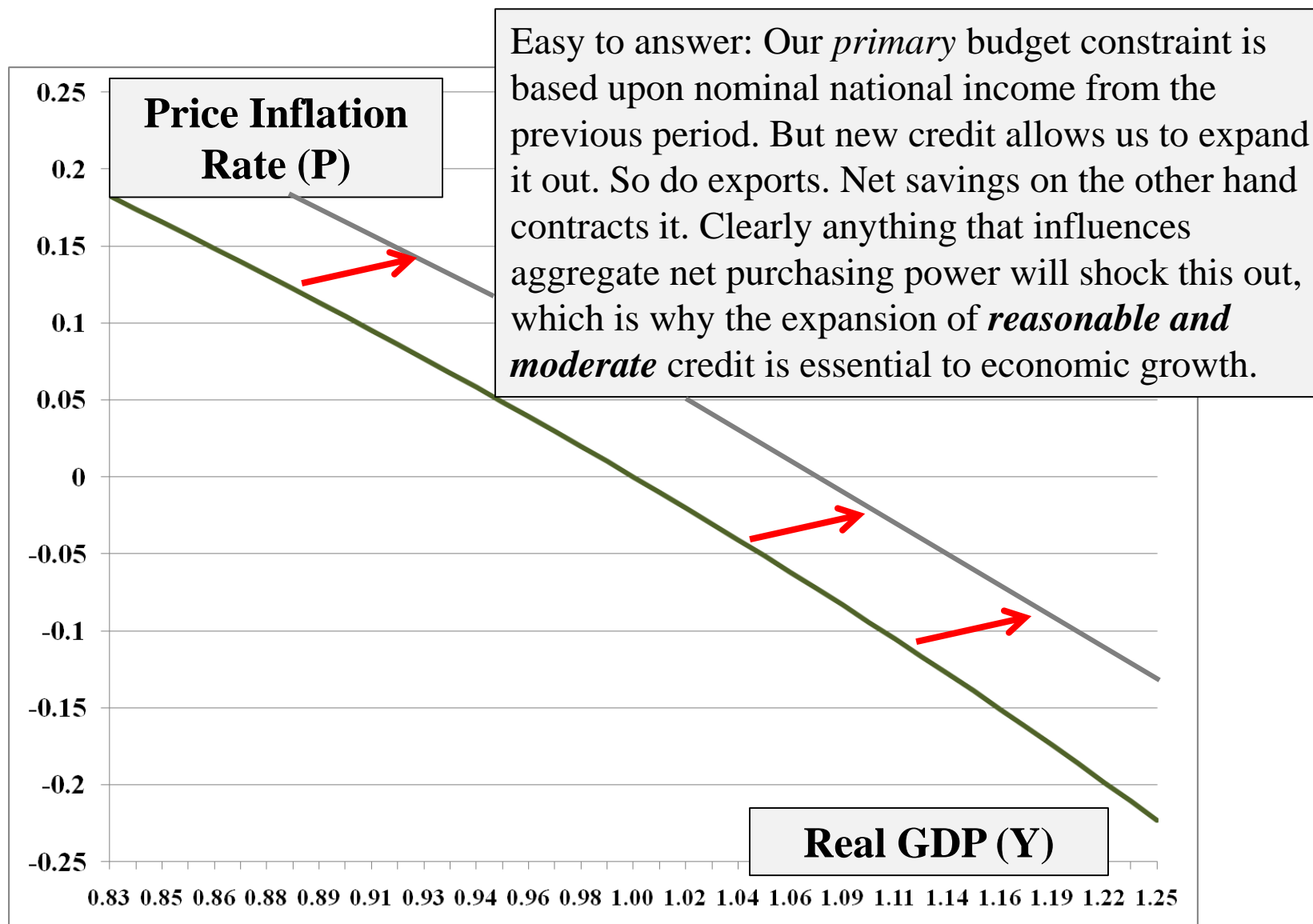
Deriving the Aggregate Demand Curve as a Function of a Price Deflator



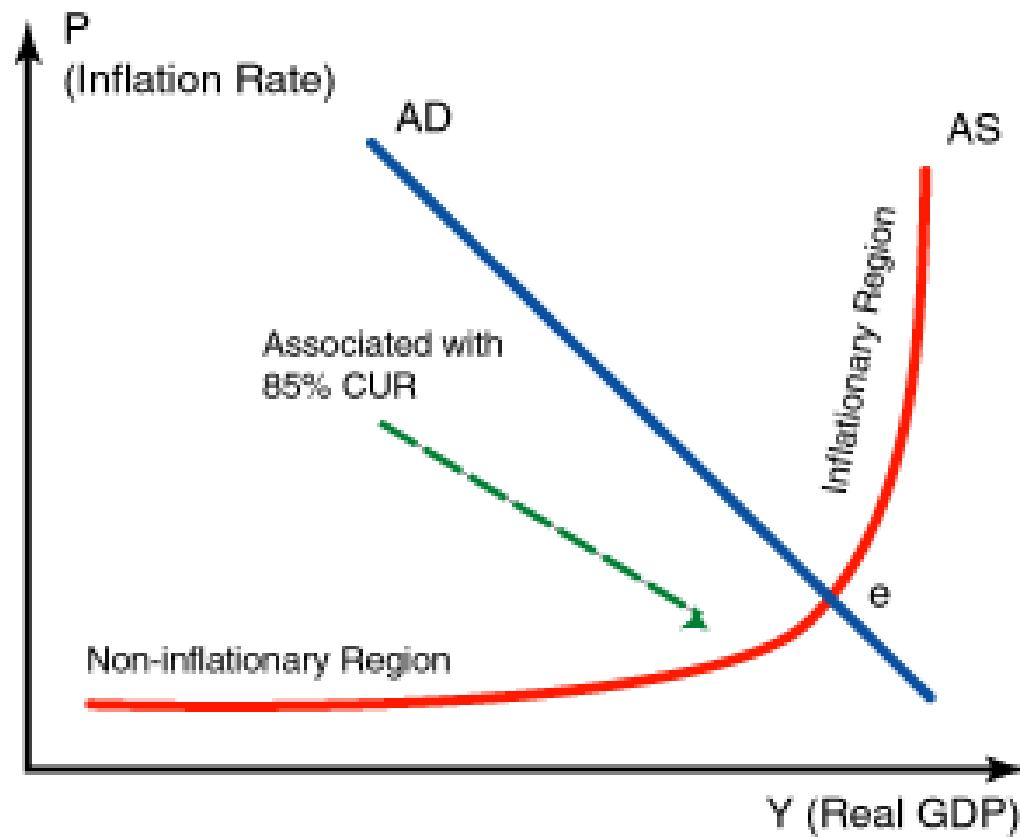
Transforming the Price Deflator to an Inflation Rate (continuous rather than discrete)



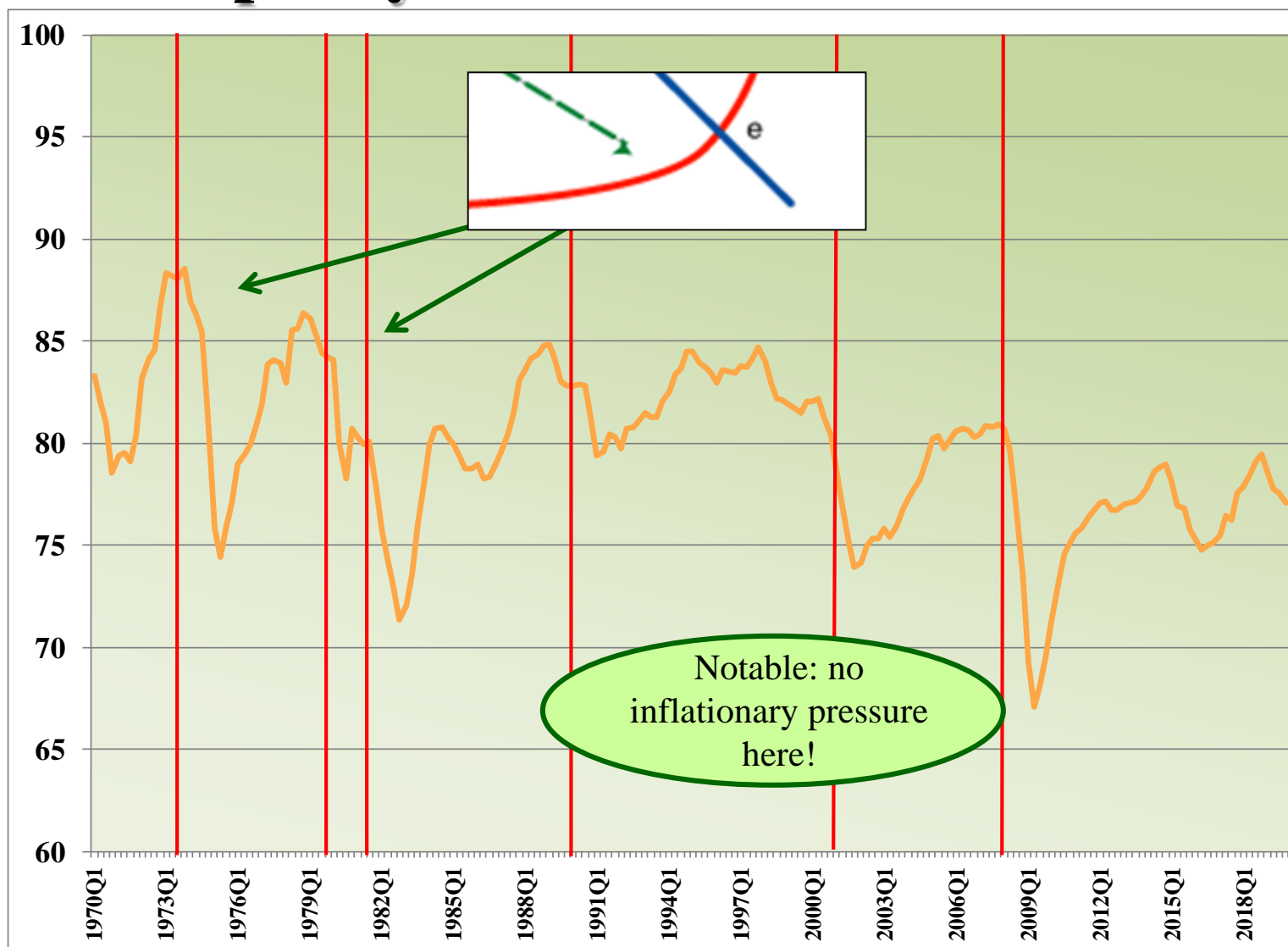
So how do we shock out of the steady state?



Aggregate Supply / Aggregate Demand Model



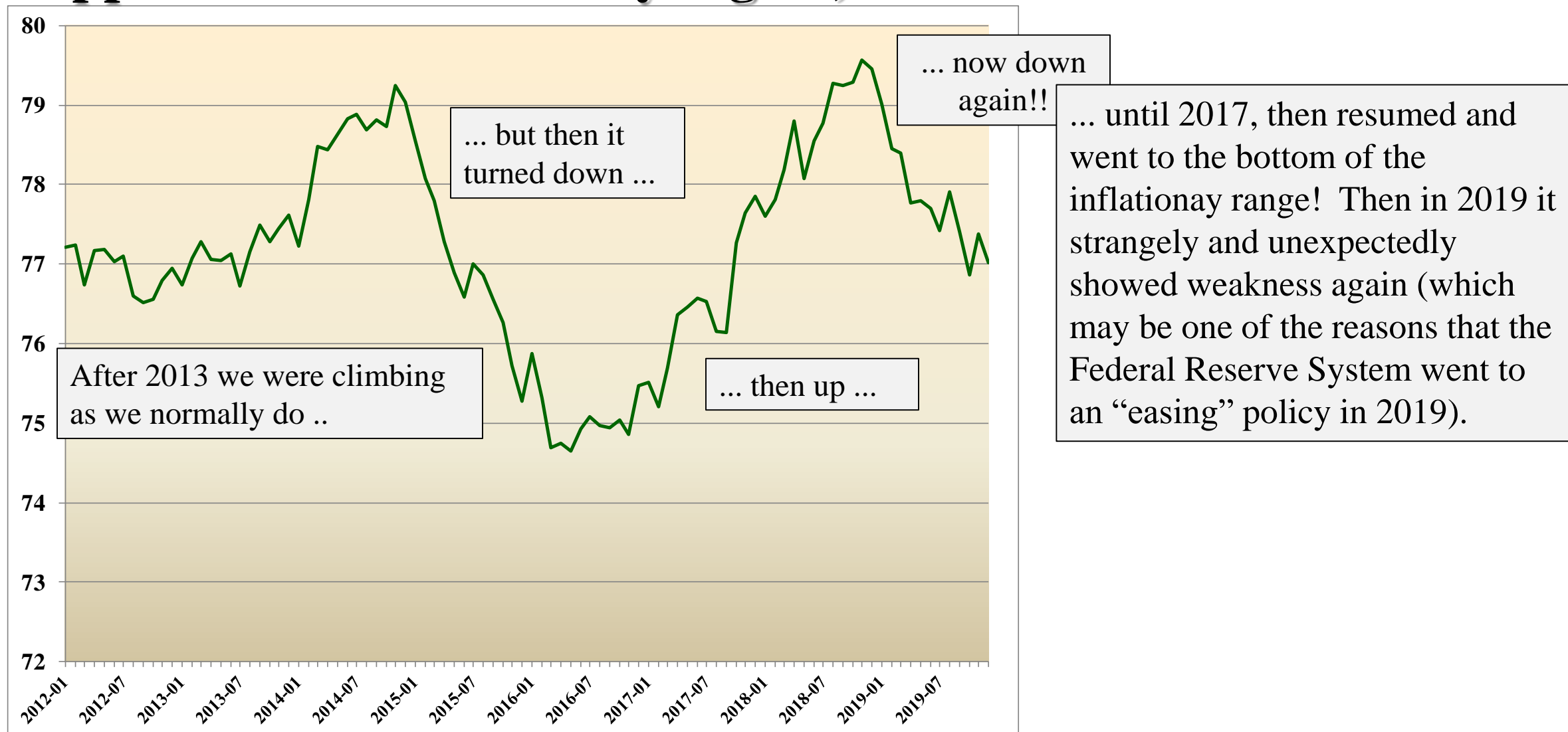
The Capacity Utilization Rate and the Kink



The correlation is loose and imperfect ... we have a “weak” theory here. Manufacturing is less important now than in the past.

Source: Federal Reserve Board of Governors, Series G-17 data. Capacity Utilization all industries, SA, quarterly. 1970-2019Q4, Red lines are **peaks** of business cycles.

Monthly data .. strength had resumed and we approach the inflationary region, then ... !



Source: Federal Reserve Board of Governors, Series G-17 data. Capacity Utilization all industries, SA, quarterly. 2012-2019 Dec (monthly data)

Factors that Effect Aggregate Supply and Aggregate Demand

Demand		Supply	
1. Income	(+)	1. Costs	(-)
2. Wealth	(+)	(a) Resource	
3. Population	(+)	(b) Labor	
4. Interest rates	(-)	2. Investment	(+)
5. Credit Availability	(+)	3. Productivity	(+)
6. Government Demand	(+)	4. Interest rates	(-)
7. Taxation	(-)	5. Credit availability	(+)
8. Foreign Demand	(+)	6. Foreign supply	(-)
9. Investment	(+)	7. Expectations	
10. Expectations		(a) Profits	(+)
(a) inflationary	(+)	(b) Inflationary	(?)
(b) income	(+)	(c) Interest rates	(?)
(c) wealth	(+)	8. Taxation	(-)
(d) interest rates	(+)		

Note: The written chapter has one of these signs wrong ...

The core mathematical model

$$AS = f \overset{(-)}{\underset{(-)}{w}}, \overset{(-)}{\underset{(-)}{rc}}, \overset{(+)}{\underset{(-)}{I}}, \overset{(-)}{\underset{(-)}{IR}}, \overset{(?)}{\underset{(-)}{IE}}, etc)$$

$$where \frac{\partial AS}{\partial w} < 0 \quad and$$

$$AD = g(I, W, P, IR, etc) \quad and$$

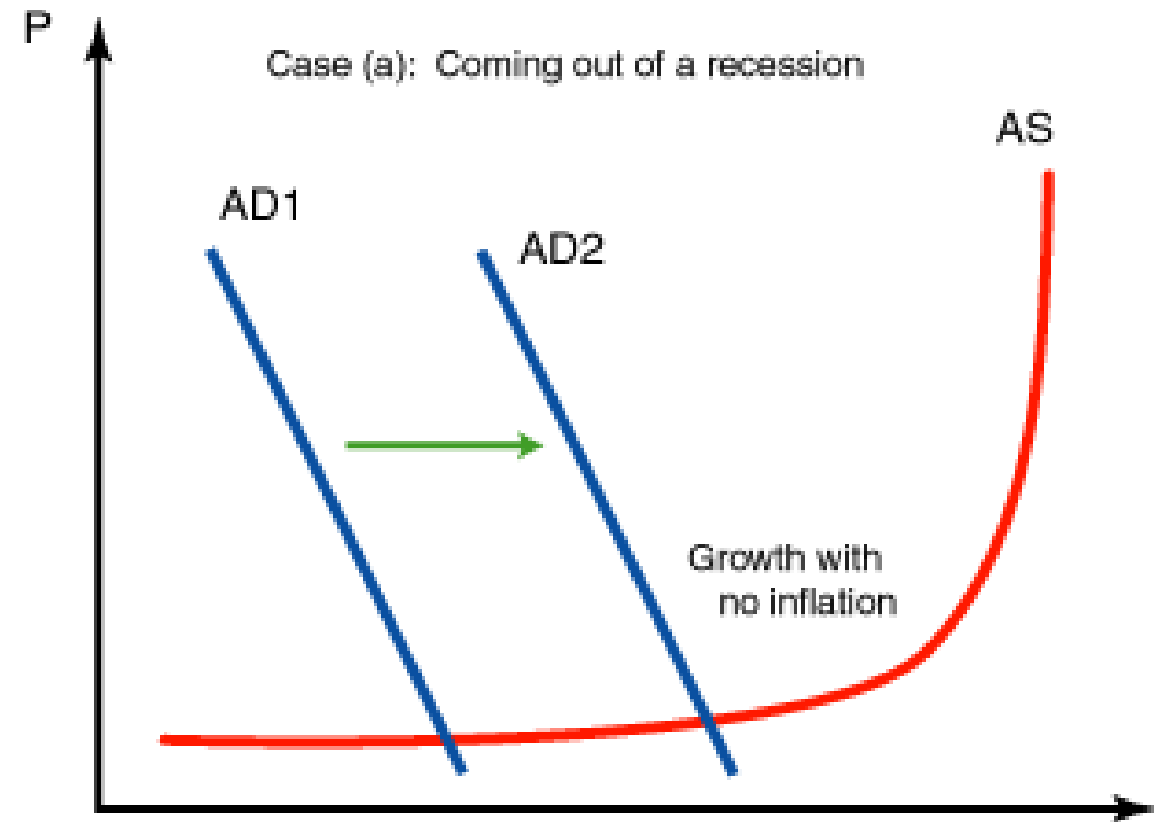
$$AS = AD$$

Questions to be answered

- What causes inflation?
- How can there be inflation with recession?
- What is the role of inflationary expectations?
- What is the effect of productivity changes?
- When are wage increases justified?
- What is the pathology of business cycles?

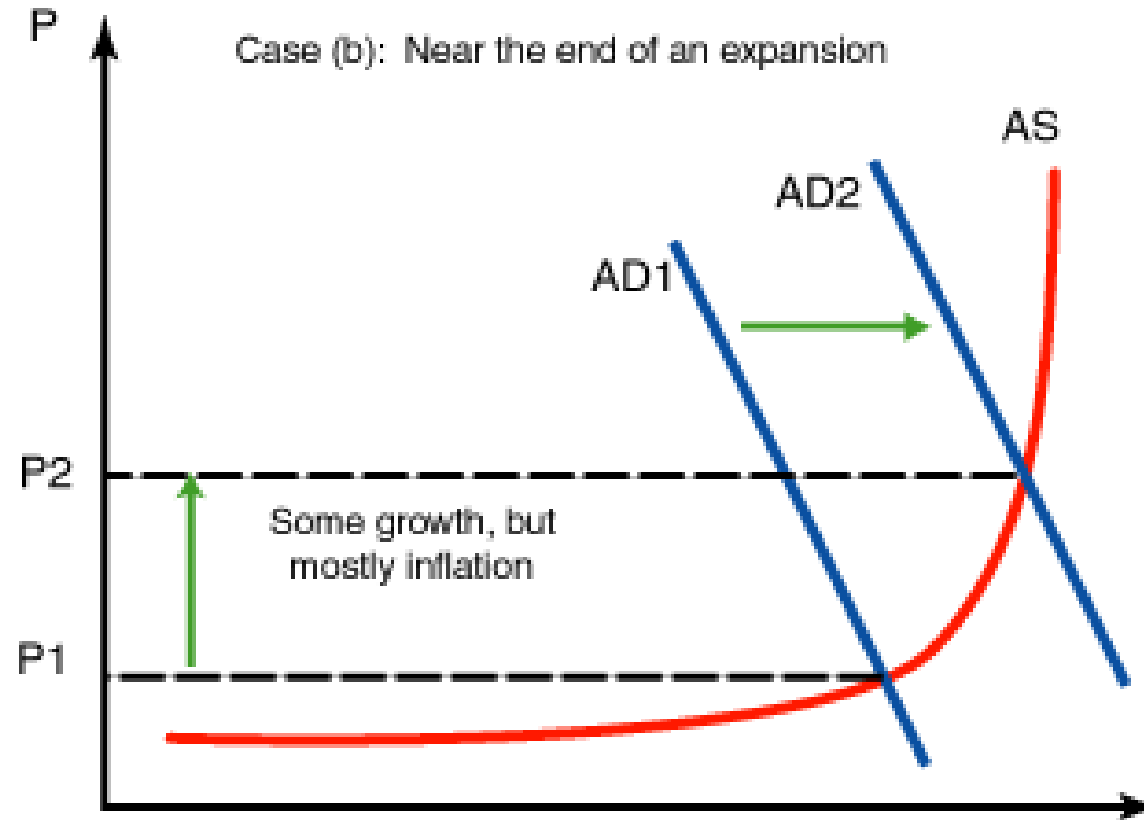
The Effects of a Surge in Aggregate Demand Upon the Inflation Rate

Case (a): Coming out of a recession

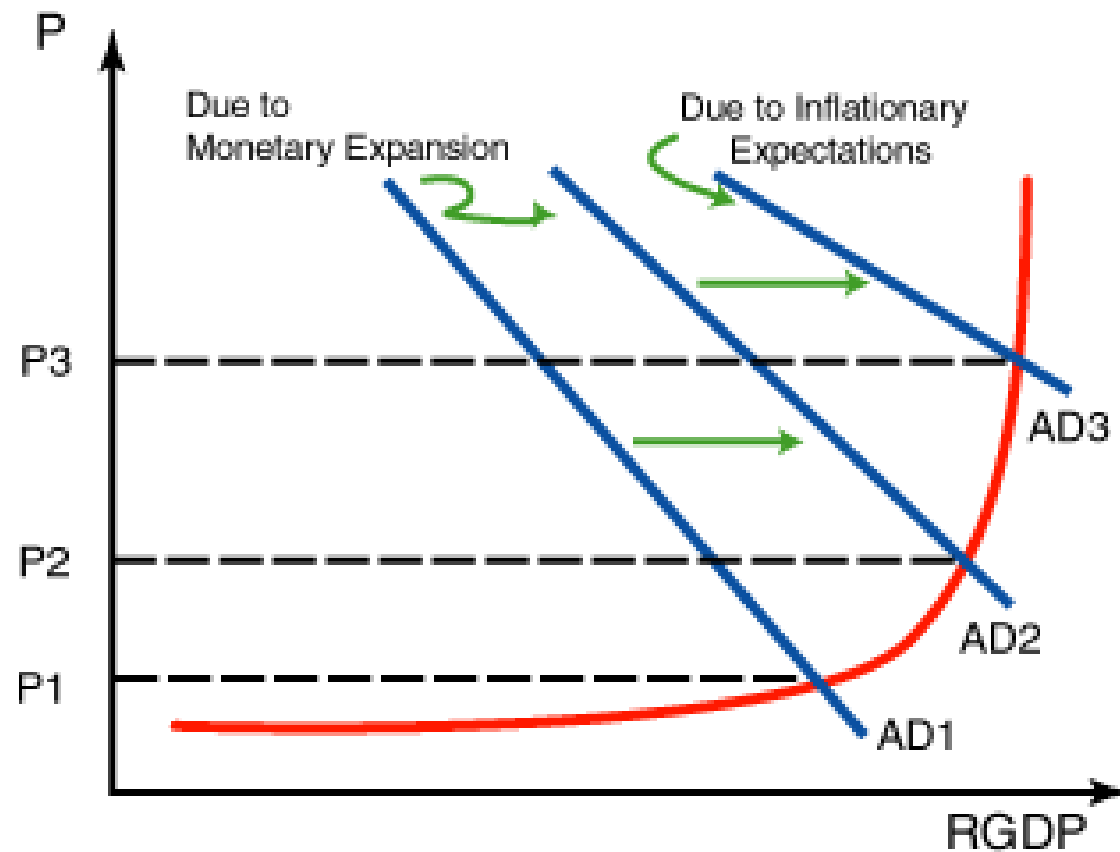


The Effects of a Surge in Aggregate Demand Upon the Inflation Rate

Case (b): Near the end of an expansion

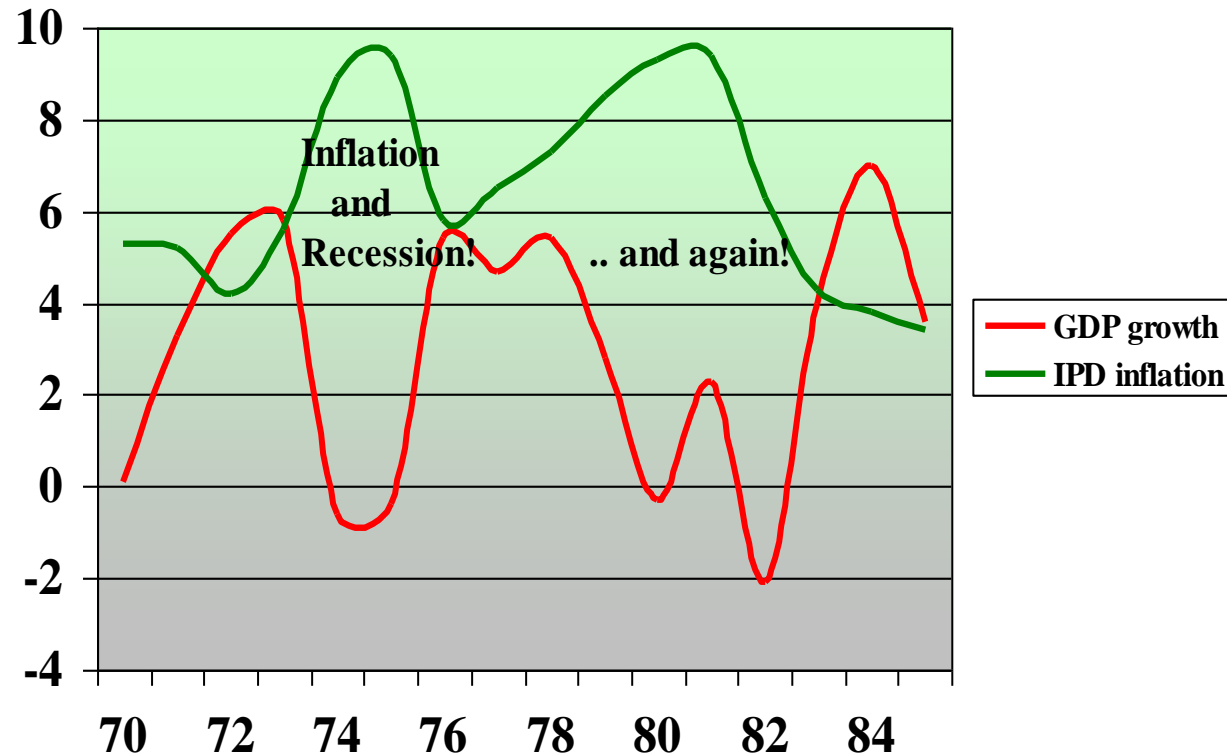


The Secondary Effects of Inflationary Expectations

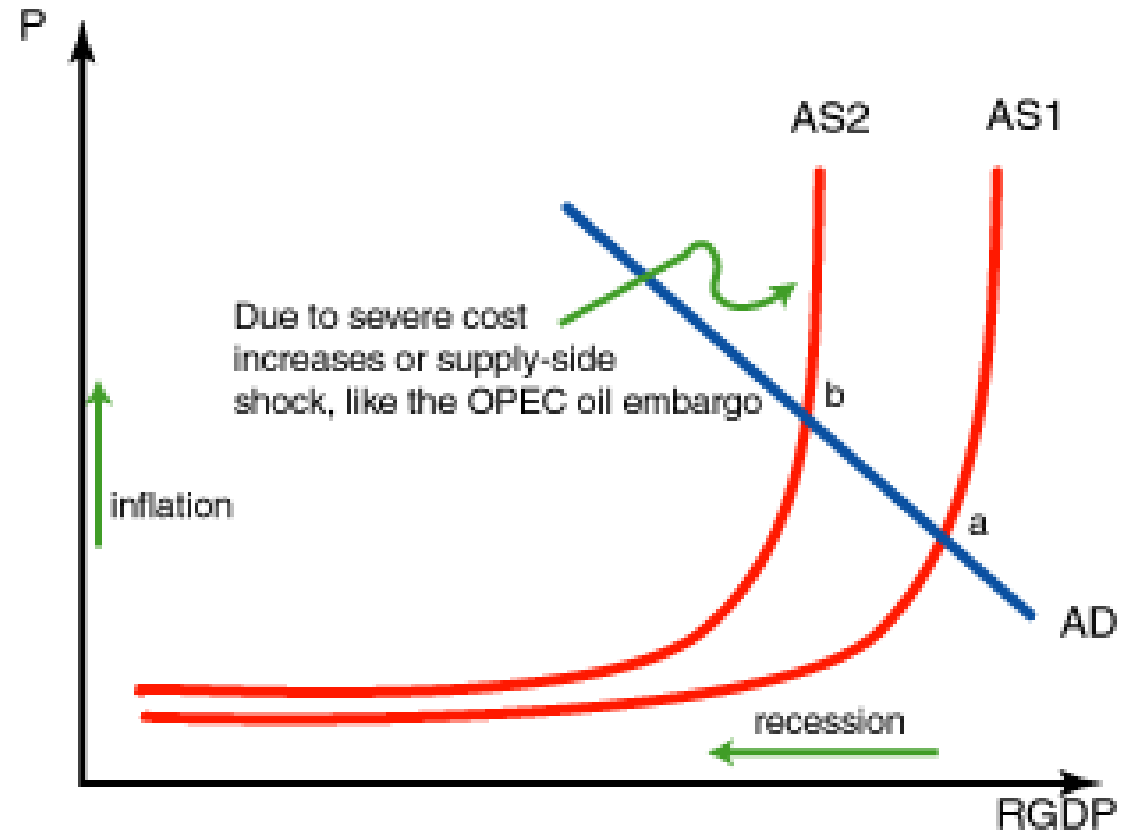


Inflation *and* Recession!

How to we explain this?

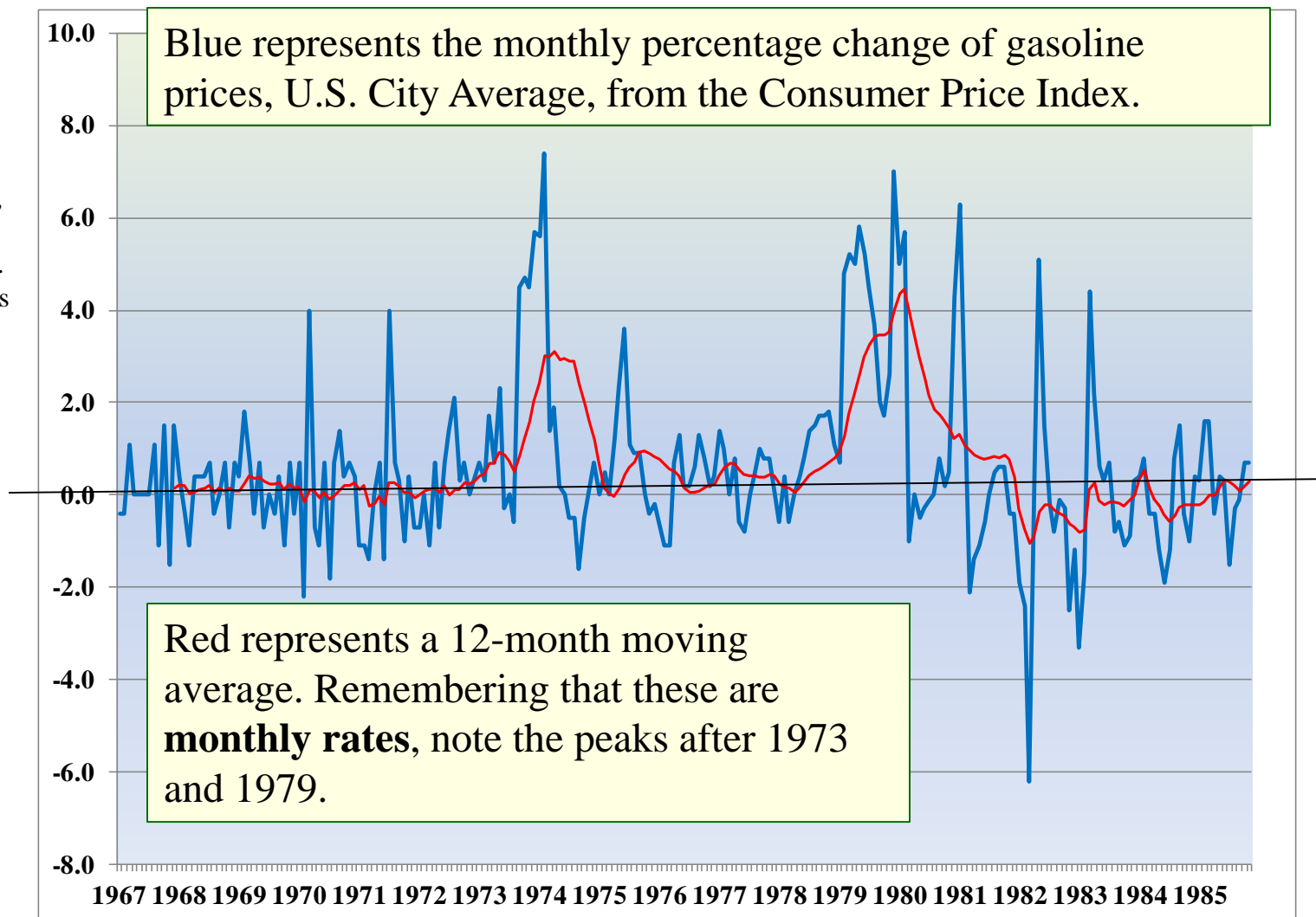


Stagflation, or Cost-Push Inflation

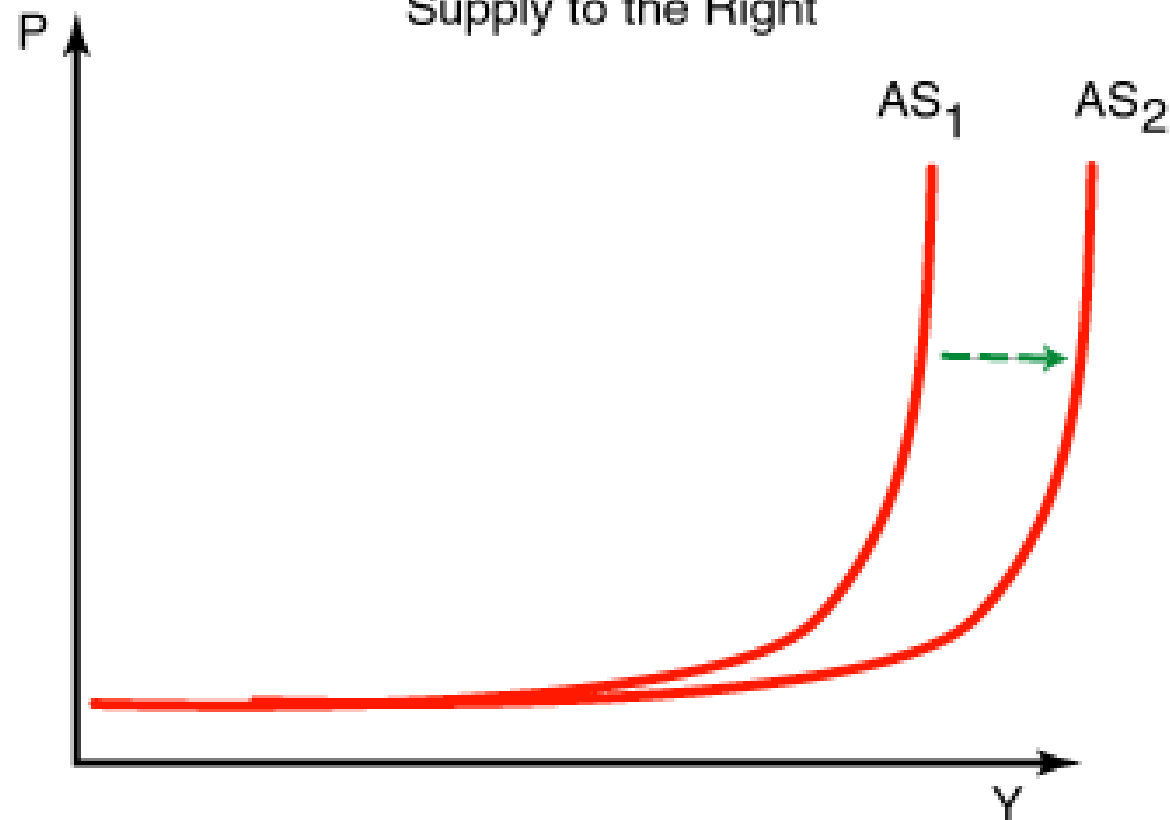


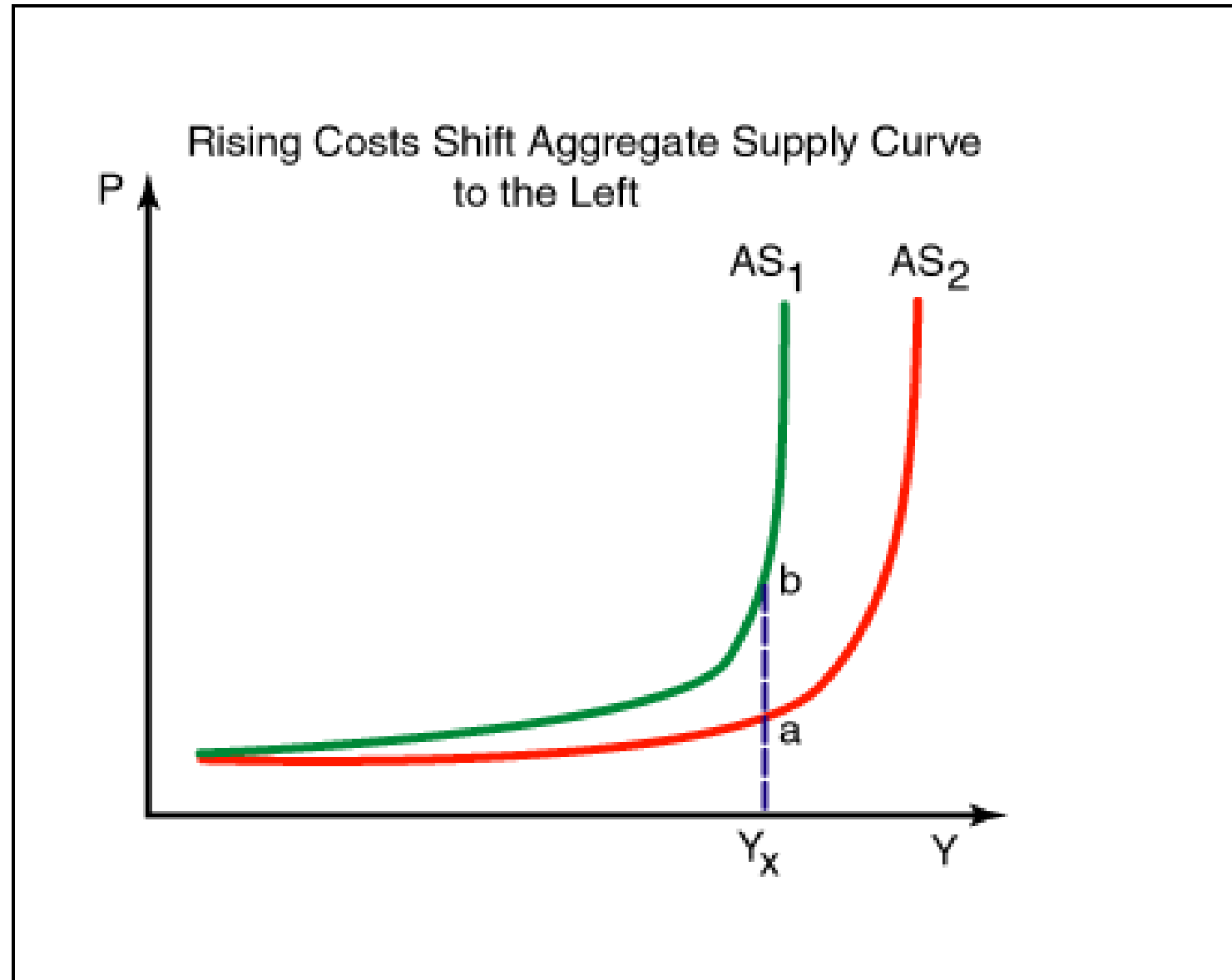
Supply-side shock: The OPEC oil embargoes of 1973 & 1979 impact upon gasoline prices in U.S.

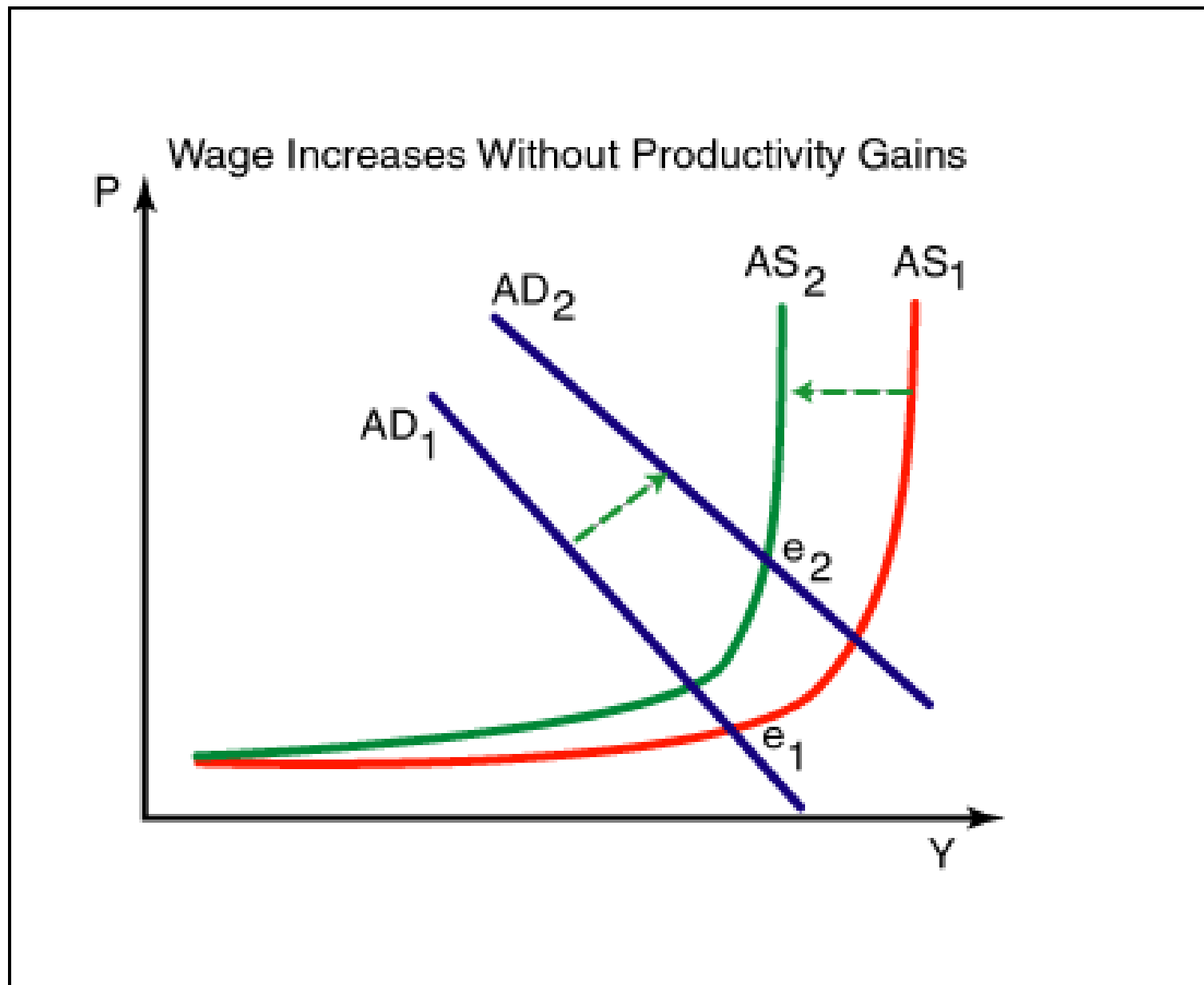
Source: Bureau of Labor Statistics, Consumer Price Index, all urban consumers, gasoline all types, U.S. city average, SA, series CUSR0000SETB01, monthly growth rate.



An Increase in Productivity Shifts Aggregate Supply to the Right







What is "productivity?"

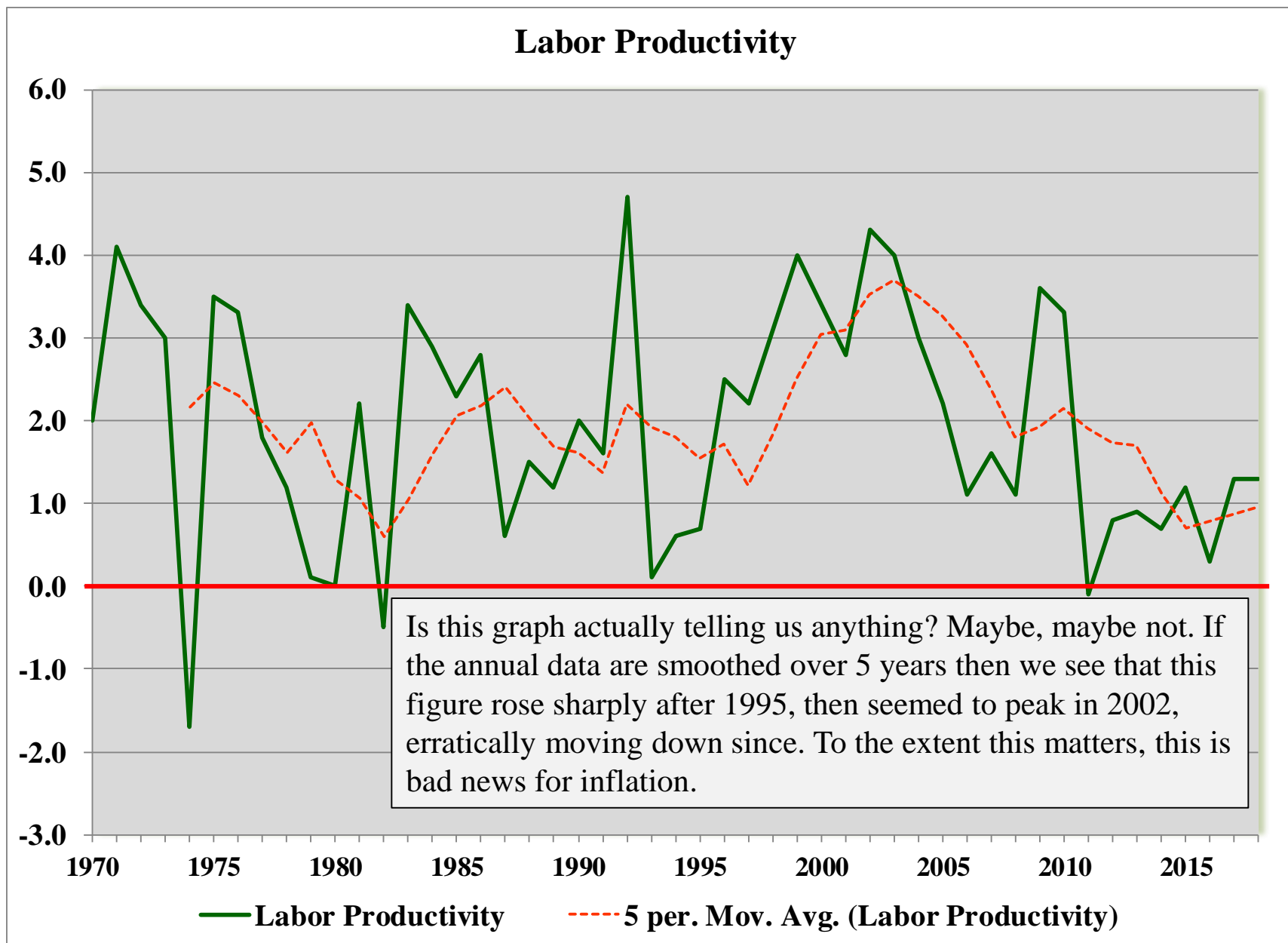
Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.

Paul Krugman, The Age of Diminishing Expectations (1994)

Productivity is both difficult to define and measure. It is meant to imply that if you have a given vector of resources, including labor, to produce a vector of outputs, productivity is said to rise if, over time, you get proportionately more output for any measure of inputs. The largest contribution to productivity will be due to the application of technology to production (including the production of services).

A relevant and commonly used measure of national productivity is the measure of Gross Domestic Product per amount of labor time. Many economists use the OECD Annual National Accounts database for international comparisons.

For the United States, we use the Bureau of Labor Statistics output-per-hour and unit labor costs.



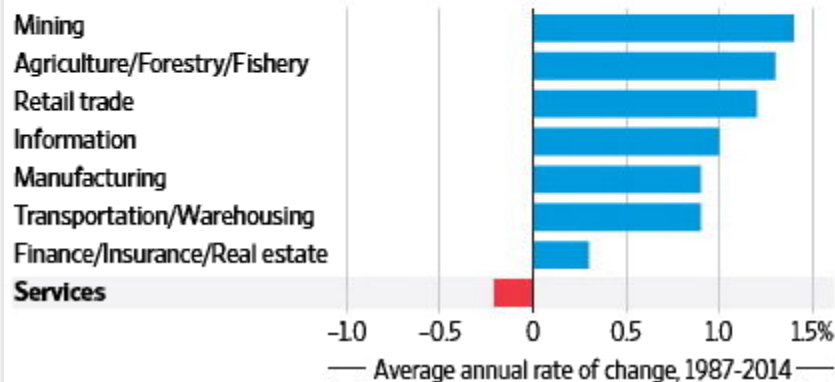
U.S. Department of Labor, Bureau of Labor Statistics, Major Sector Labor Productivity as measured by output per hour, percentage change of previous year, 1970-2018 (downloaded 2/4/2019) Series ID PRS84006092. Kept in CU file.

And what about services productivity??

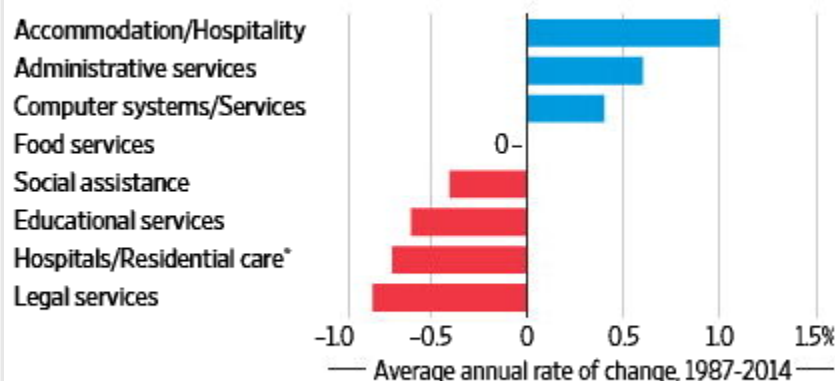
Are You Being Served?

Services productivity has declined overall since the 1980s, especially in the fast-growing health and education sectors.

Productivity by selected sectors



Services sector productivity by selected industries



*Includes nursing Source: Brookings Institution

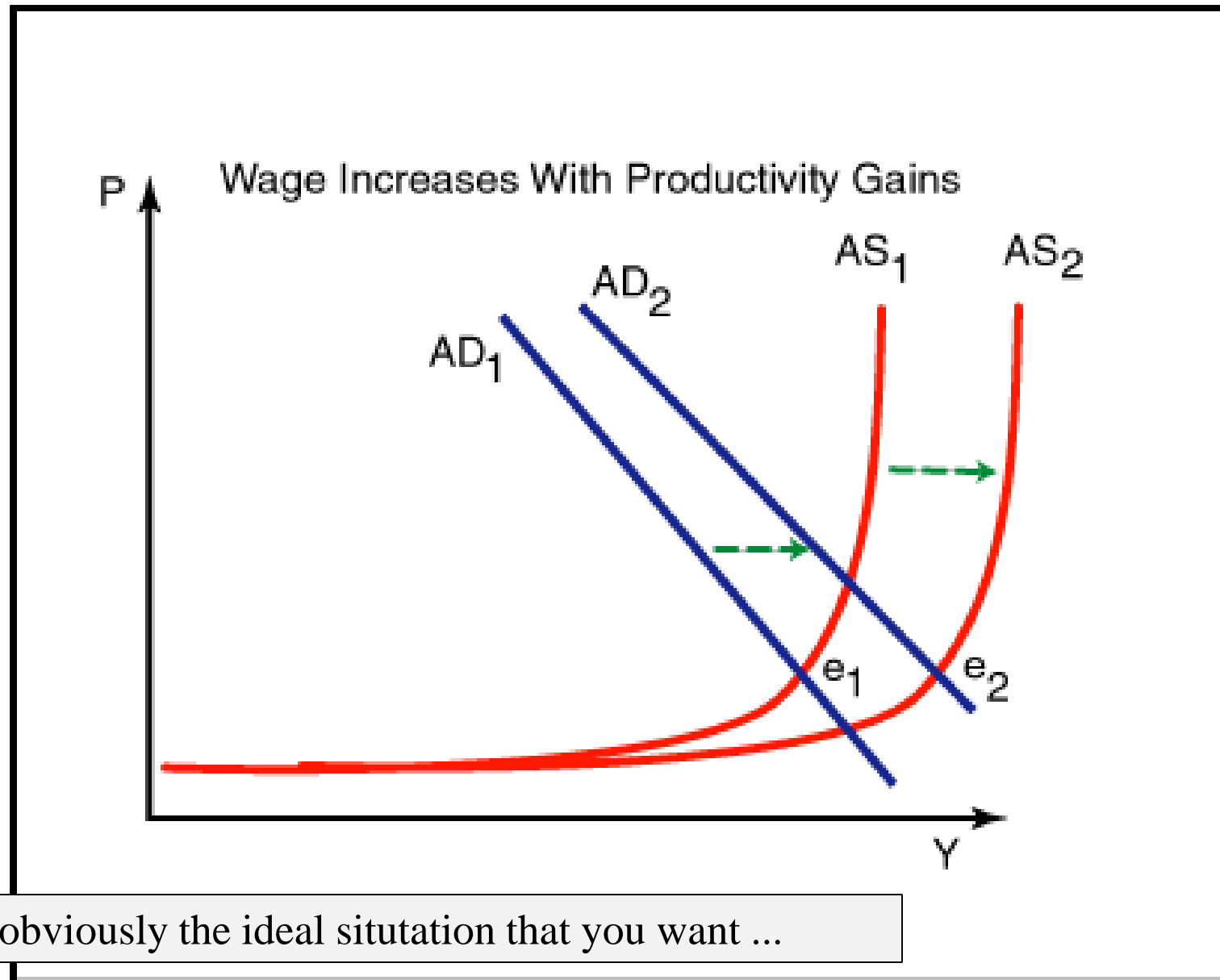
THE WALL STREET JOURNAL.

Education sector??

Seriously??

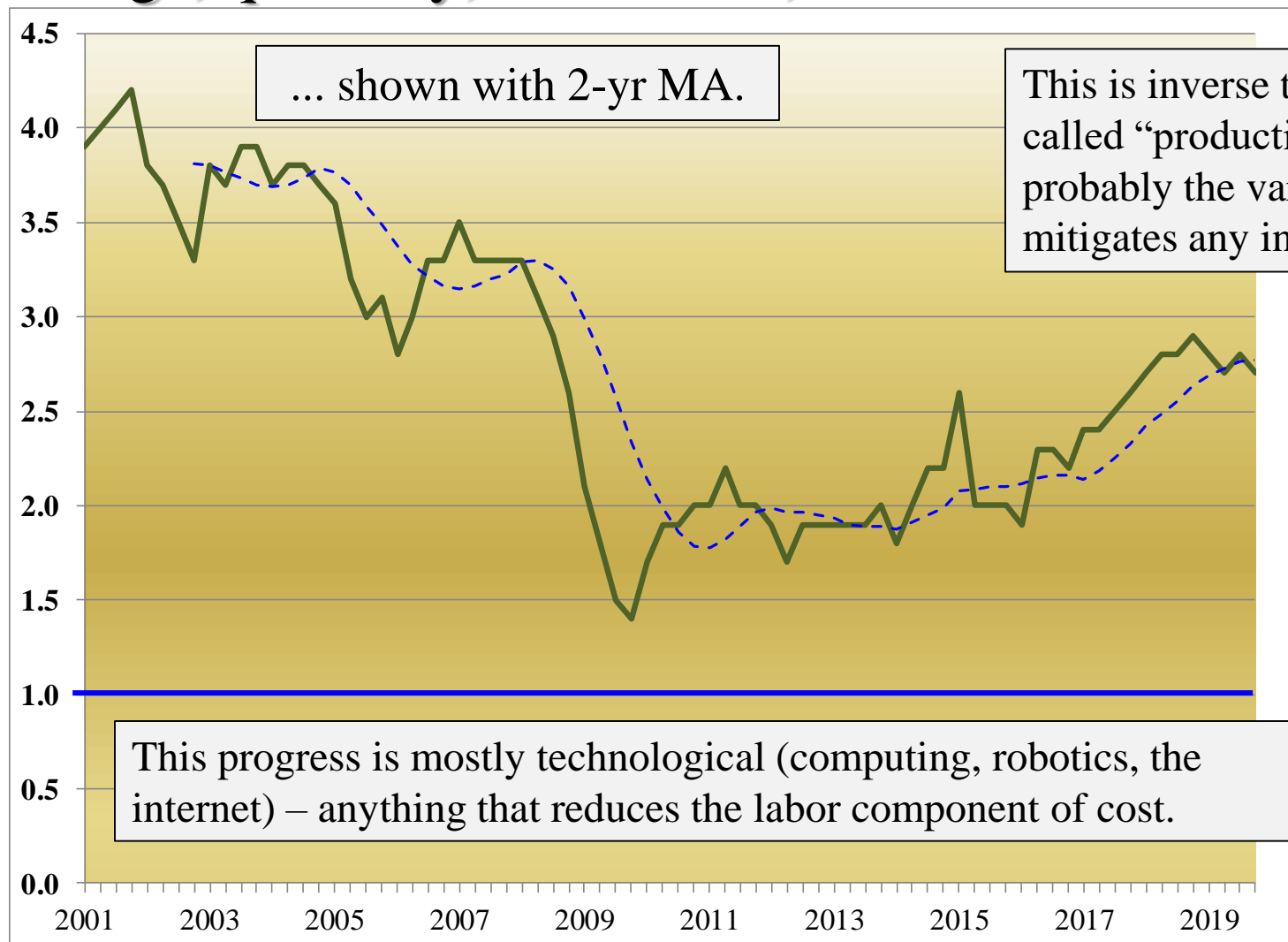
How can anyone possibly claim that productivity is stagnant in education??

Well at least we are better than lawyers and doctors.



BLS Employment Cost Index

Total compensation, all civilian, annualized % change, quarterly, 2001-2019, NSA



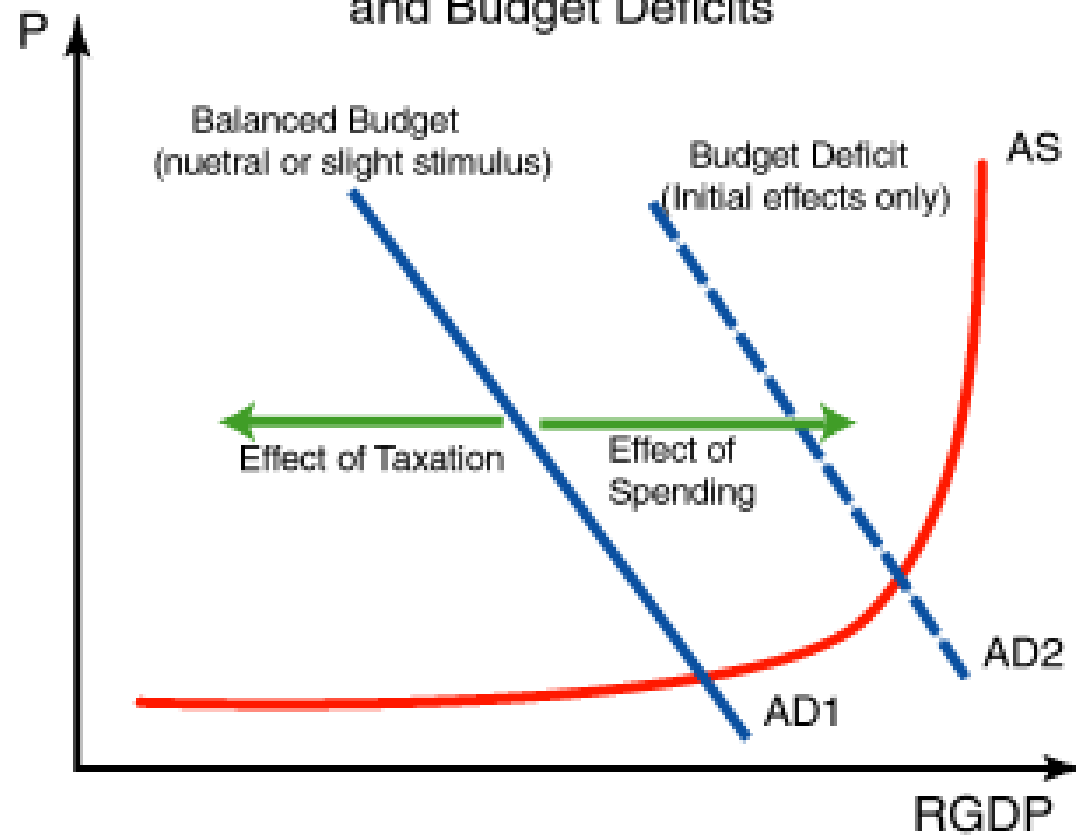
... shown with 2-yr MA.

This is inverse to what is called “productivity” and is probably the variable that most mitigates any inflation threat.

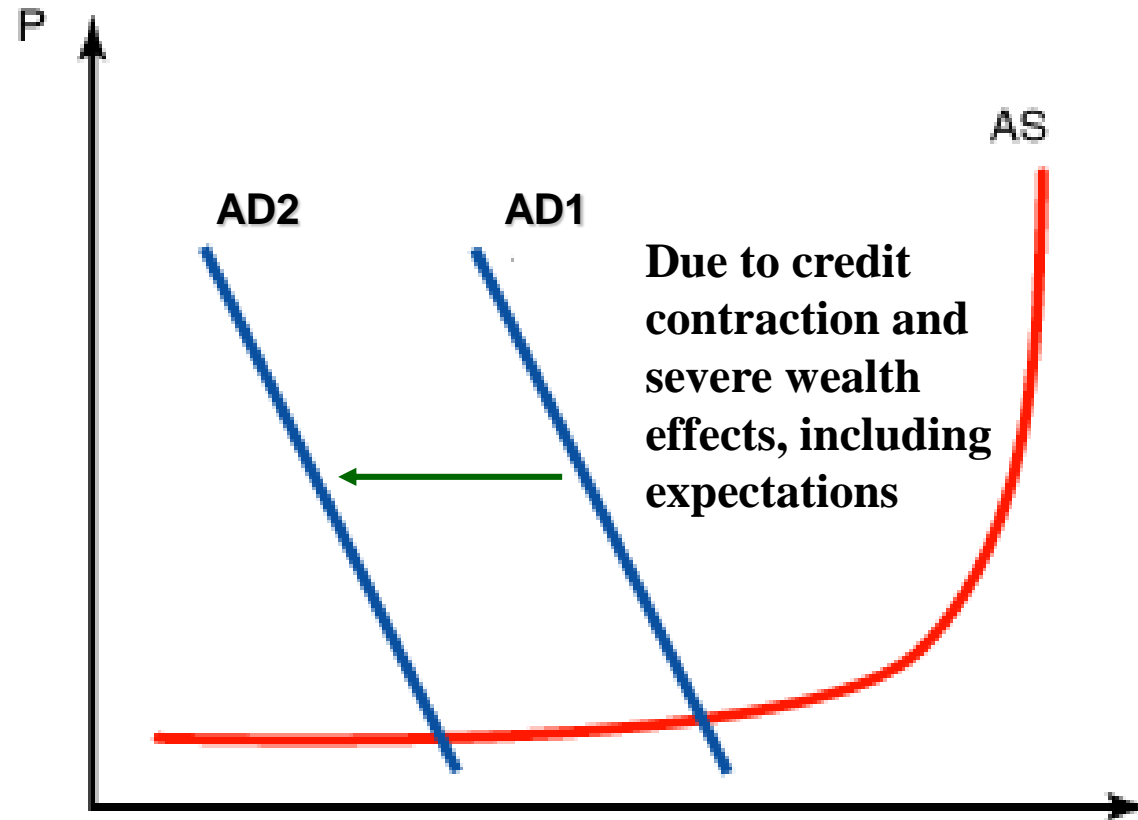
This is the inflation monitor that the Federal Reserve System uses.

This progress is mostly technological (computing, robotics, the internet) – anything that reduces the labor component of cost.

The Effects of Government Taxing, Spending and Budget Deficits



The Recession in 2008-2010



The U.S. Economy in 2020: Deficit-financed spending?

