

Econ 113 Econ 115: Problem Set 2

Spring 2017: Due May 1, 2017

Problem 1: The Longer Depression of 2008-?

In 2007 for the (real) GDP of the post-industrial North Atlantic economies as a whole, the situation roughly corresponded to the following values for the quantities in our summary macroeconomic national income equation:

$$Y = E = \mu[c_0 + I_0 + NX] - \mu I_r \times r + \mu G$$

$Y = E$ = aggregate demand, total spending, national income, GDP

μ = multiplier = 2.5 (at the level of the North Atlantic as a whole)

NX = net exports = 0 (at the level of the North Atlantic as a whole)

I_r = sensitivity of investment spending to the interest rate = 200 (i.e., a 1%-point rise in the interest rate reduces investment spending in a year in the North Atlantic as a whole by \$2 trillion)

c_0 = consumer confidence = \$2 (trillion)

I_0 = business investment committees' "animal spirits"—their optimism or pessimism = \$18 trillion

r = long-term risky real interest rate relevant for investment planning = nominal interest rate minus expected inflation = 5% (0.05)

G = government purchases = \$10 (trillion)

And note that, in general, each move by central banks to push the short-term safe nominal interest rate i that they control up or down induces half as large a move in the long-term risky real interest rate r that they influence.

(a) What was the equilibrium value of $Y = E$ = aggregate demand, total spending, national income, GDP in the North Atlantic as a whole?

(b) During 2008 and the winter of 2009 the central banks of the North Atlantic reduced the interest rate they control—the i , the short-term safe nominal interest rate—from its 2007 value of 5% as far as they could. But in general central bank reductions in the short-term safe nominal interest rate i induce only half as large a reduction in the real interest rate r : financiers and others believe that such monetary policy moves are not permanent but transitory, and will be reversed in relatively short order. So how much of an upward push did this shift in monetary policy give to North Atlantic annual real GDP?

(c) 2008 and 2009, however, saw the real interest rate r not fall but rise by 2%-points: the reduction in interest rates was not large enough to offset the effects on businesses' borrowing costs of the financial crisis. So how much of a downward push did movements in real interest rates in total give to North Atlantic annual real GDP?

(d) Before austerity began, in 2009, North Atlantic governments in total raised government purchases by \$1 (trillion). What was the net effect of everything—financial crisis, active economy-boosting monetary policy, and increases in government purchases—on North Atlantic real annual GDP?

(e) Today North Atlantic annual real GDP is still \$5 (trillion) below its normal late-business cycle expansion potential benchmark as achieved in 2007. Today austerity has depressed government purchases by \$2 (trillion) below the 2007 benchmark, and real interest rates are now still 2%-points (0.02) below their 2007 benchmark. If there had been no other changes relative—no changes to consumer confidence c_0 , business “animal spirits” I_0 , or North Atlantic net exports NX —we would expect North Atlantic annual real GDP to be not \$5 (trillion) below its normal late-business cycle expansion potential benchmark, but where?

(f) Bankers, goldbugs, and others—including campaign-season Donald Trump—call for North Atlantic central banks to reverse their policies of “excessive monetary ease” and raise the interest rate i they control by 4%-points to “normalize” real interest rates and properly reward savers. What effect would such a policy shift by the North Atlantic governments have on North Atlantic annual real GDP relative to potential?

(g) Last week President Donald Trump reversed his campaign position on the Federal Reserve and interest rates. During the campaign he said that Federal Reserve Chair Janet Yellen was keeping interest rates low “because she’s obviously political and doing what Obama wants her to do. What [the Federal Reserve] are doing is, I believe, is a false market. Money is essentially free...” Last week he said, instead: “I do like a low-interest rate policy, I must be honest with you.... Asked if Ms. Yellen was ‘toast’ when her term ends in 2018, Mr. Trump said, ‘No, not toast. I like her, I respect her. It’s very early...’” What do you think Treasury Secretary Steve Mnuchin and Chief Economic Advisor Gary Cohn said to Donald Trump to produce this change?

Problem 2: Trade with Mexico

In 2018 Mexican GDP will be about \$1.2 trillion and U.S. GDP will be about \$20 trillion. Exports from Mexico to the United States excluding re-exports—i.e., excluding the value of products made in the United States and exported to Mexico for further reprocessing and then brought back here—will be about \$120 billion. Let's set the expected price of Mexican exports if nothing happens, that is, under NAFTA, is equal to 1—so that the expected quantity of exports will be \$120 billion of real goods and services.

Suppose that the demand curve by American consumers for Mexican products in 2018 is:

$$P_d = 3 - Q_d/60,$$

where P_d is denominated in index numbers and Q_d is denominated in billion real-goods dollars a year.

And suppose that the supply curve is:

$$P_s = 0 + Q_s/120$$

where again P_s is denominated in index numbers and Q_s is denominated in billion real-goods dollars a year.

(a) What is the equilibrium price and quantity of Mexican exports (excluding re-exports) to the United States under NAFTA?

(b) What is the equilibrium consumer surplus to U.S. consumers and producer surplus to Mexican exporters under NAFTA?

(c) Suppose that Donald Trump abrogates NAFTA, imposes an embargo on trade with Mexico as a bargaining ploy (don't laugh: Thomas Jefferson did it), and trade for 2018 shuts down. Who loses the most? Why?

(d) But who loses most proportionally?

(e) Suppose that Secretary of State Rex Tillerson persuades President Donald Trump that cable newscasters will beat up on him badly for breaking the U.S.'s word, but that an alternative policy would be asking Mexico to impose VERs—voluntary export restraints—and that Mexico agrees to cut back its exports in 2018 to \$60 billion in real good quantity as long as it can sell them for what the market will bear. What is the export-quota equilibrium price and quantity? What is the export quota producer and consumer surplus?

Problem 3: NIMBYism in Greater San Francisco

Suppose that the supply curve for housing in an American sunbelt megacity is:

$$P = 0.125 Q$$

where P is the price per month per bedroom of an attractive central location, and Q is the number of bedrooms—the number of people—in millions. (People in less attractive locations get a discount, and people who own rather than rent have a more complicated problem. But for simplicity assume that we can represent this whole market by just one supply curve and one demand curve.)

(a) Demand for housing in a west coast sunbelt city—call it Ellay—is:

$$P = 4 - 0.125 Q$$

where, once again, P is the price per month per bedroom of an attractive central location, and Q is the number of bedrooms—the number of people—in millions. What is the equilibrium price? The equilibrium quantity? The consumer surplus? The producer surplus?

(b) Now let's consider another west coast megacity: call it Esseff. The supply curve and the demand curve for housing in Esseff are the same as in Ellay. But local politics have given control over zoning to the NIMBY lobby—Not In *My* Back Yard—and so the housing stock in Esseff is fixed by government regulation at a maximum of 6 million bedrooms. Suppose rent control has been outlawed—landlords lucky enough to have built can charge what the market will bear. What is the equilibrium price? The equilibrium quantity? The consumer surplus? The producer surplus?

(c) Are landlords as a class happy or unhappy that Esseff has powerful zoning and growth restrictions—that Esseff is not Ellay? How happy or unhappy are they?

(d) Are people trying to live in Esseff as a class happy or unhappy that Esseff has powerful zoning and growth restrictions—that Esseff is not Ellay? How happy or unhappy are they?

(e) Why doesn't the net happiness or unhappiness that Esseff is not Ellay sum up to zero?

Problem 4: Inequality: Property and Labor

According to Thomas Piketty, the ratio of the wealth of the overclass to the total income of society as a whole will settle at a steady-state ratio W/Y (where W is the wealth of the overclass, and Y is the total income of society as a whole) at which:

$$r - g = 0$$

where r is the rate of accumulation of wealth and g is the growth rate of the economy. (You probably want to be working in decimals rather than percentages in order to make your lives easier.)

We can further express the rate of accumulation as:

$$r = \pi - x - t$$

where π is the rate of profit received by wealth, x are the expenditures (largely conspicuous consumption) of the overclass, and t is the tax rate—including wartime destruction, revolutionary confiscations, etc.—in the economy.

Suppose that the rate of profit in the economy is itself given by the equation:

$$\pi = 0.2 \times (Y/W)^{0.5}$$

The rate of profit is equal to 0.2 times the square-root of the ratio of annual income to total overclass property wealth—the higher the ratio of property wealth to income, the more difficult it is to accumulate profits. To make your lives easier, plug in π into your other equations as a decimal

(a) **The pre-1789 European Ancien Régime:** $g = 0.5\%$ /year in a near-stagnant, still Malthusian economy. $x = 2.5\%$ /year as the requirements of status competition and display are high, and $t = 2\%$ /year as property is secure. What, in the Ancien Régime, was the steady-state property wealth to national income ratio W/Y ? What, in the Ancien Régime, was the rate of profit π ?

(b) **The 1865-1929 Belle Époque:** $g = 4.0\%/year$ in an expanding industrial economy. $x = 0.5\%/year$ as the requirements of status competition and display are substantial but wealth has accumulated so that it is genuinely hard to spend, and $t = 1.5\%/year$ as property becomes secure. What, in the Gilded Age, was the steady-state property wealth to national income ratio W/Y ? What, in the Gilded Age, was the rate of profit π ?

(c) **The 1933-1980 Social Democratic Age:** $g = 4.5\%/year$ in an expanding industrial economy. $x = 0.5\%/year$ as the requirements of status competition and display are less and wealth has accumulated so that whatever you spend is trivial, and $t = 5\%/year$ as property is taxed to support big government. What, in the Social Democratic Age, was the steady-state property wealth to national income ratio W/Y ? What, in the Social Democratic Age, was the rate of profit π ?

(d) **(Perhaps) the Post-2010 Second Gilded Age:** $g = 2\%/year$ in a slowing and aging North Atlantic economy. $x = 0.5\%/year$ as the requirements of status competition and display are less and wealth has accumulated so that whatever you spend is trivial. $t = 2\%/year$ (perhaps) as North Atlantic economies move toward non-progressive “flat” taxes. If this scenario comes to pass, what, when the Second Gilded Age reaches its steady-state wealth-to-national-income ratio, will be that ratio W/Y ? If this scenario comes to pass, what will be the future rate of profit π ?

pages: <https://www.icloud.com/pages/0HE2HodxFbazT3ifDu7wUbigQ> #TCEH