Econ 1: Budget Economics II

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April 25, 2012
The “Current-Law Baseline” Is Close to Balanced

• Primary fiscal gap of 1.2% of GDP over the next 25 years
• But the CBO does not believe congress and the president will stick to the current-law baseline
  – “Middle class” tax cuts (0.7%)
  – High bracket tax cuts, estate tax, etc. (0.6%)
  – “AMT fix” (0.3%)
  – “doc fix” (0.2%)
  – R&D credit (0.1%)
  – Special tax on high-cost health plans (0.8%)
  – iPAB (0.9%)

• Alternative fiscal scenario: primary fiscal gap of 4.8% of GDP
Deficits and the Economy

• Macroeconomists work in three runs:
  – Short run
    • Productive capabilities of the economy do not change significantly, prices do not fully adjust. Production can deviate from potential output.
  – Medium run
    • Short-run deviations of production from potential output are ironed out. Prices adjust so inflation finds its level. Economy grows.
  – Long run
    • Government debt must be paid back (or at least balanced) or defaulted upon
The Short Run: What Is to Be Done in Depression?

• Normally the Federal Reserve boosts the money supply, and people spend more

• The Federal Reserve can try all kinds of expedients—non-standard monetary policy—to try to cajole people into spending more

• Or the government can spend more: the government’s money is, as far as buying stuff, as good as anybody else’s
  – So in the short run—which lasts as long as unemployment is substantially elevated—the government should spend more
  – And perhaps the government should tax less as a way of cajoling private-sector households to spend more—but that is less certain and sure
The Medium Run

• Someday our period of elevated unemployment will end
  – Then \( Y = Y^* \)

• The equation we then want to look at is the full-employment national income identity
  – \( Y^* = C(Y-T) + I + G + (NX) \)

• If we boost \( G \), we should then also take steps to reduce \( C \) by raising \( T \)

• If not, then \( I \) will fall

• And if \( I \) falls, economic growth over any five or ten year span will fall

• And right now it looks as though we don’t have economic growth to spare
The Medium Run: Baseline and Alternative Fiscal Scenario Deficits

Deficits or Surpluses (Percentage of GDP)

Actual

Projected

CBO’s Baseline Projection

Alternative Fiscal Scenario

Baseline and Alternative Fiscal Scenario Debts Held by the Public

**Federal Debt Held by the Public Projected in CBO’s Baseline and Under an Alternative Fiscal Scenario**

(Percentage of gross domestic product)

**Source:** Congressional Budget Office.

**Note:** The alternative fiscal scenario incorporates the assumptions that all expiring tax provisions (other than the payroll tax reduction), including those that expired at the end of December 2011, are instead extended; that the alternative minimum tax is indexed for inflation after 2011 (starting at the 2011 exemption amount); that Medicare’s payment rates for physicians’ services are held constant at their current level; and that the automatic enforcement procedures specified by the Budget Control Act of 2011 do not take effect. The budgetary effects under the alternative fiscal scenario also include the incremental interest costs associated with projected additional borrowing.
Is Running the Debt-to-GDP Ratio Up to 92% Over the Next Decade a Catastrophe? No
The Long Run: Beyond 2020

Federal Debt Held by the Public

Percentage of GDP

Actual

Projected

Alternative Fiscal Scenario

Extended-Baseline Scenario
Beyond 2020...

- Either we fix our politics
  - I.e., stick to PAYGO
  - Milton Friedman’s “A Program for Fiscal Stability” proposal in the early post-WWII years that no government spending program be passed without a funding source
- Or—if we continue to (a) have and (b) elect the Republican Party we have had since 1980—we have a big problem
And at Some Point the Bond Market Vigilantes Will Show Up, and Force Us

The bond market vigilantes, come to kill us all, crest the horizon...
But We Don’t Have to Worry Until the 2020s or 2030s, Right? Right? Right? Wrong!

European Bond Spreads
Basis points, 10-year bond spread to German bonds

The long run comes when the bond market says it comes... The long run comes when the bond market says: "show us the money"...
Economics 1: Long-Run Growth

J. Bradford DeLong, Lanwei Yang, and a cast of thousands...

April 25, 2012
Rule of 72

- A quantity growing at 1%/year doubles in 72 years...
- A quantity growing at 2%/year doubles in 36 years...
- A quantity growing at 3%/year doubles in 24 years...
- A quantity growing at 0.1%/year doubles in 720 years...
- A quantity growing at 0.01%/year doubles in 7200 years...
The Bird’s Eye View: Before the Invention of Agriculture

• Population Status
  – Maybe 100K in 48,000 BC?
  – Buff
  – Short-lived
  – Maybe 5M in 8000 BC?

• Rule of 72
  – 50-fold—that’s almost 6 doublings
  – A doubling every 7,000 years
  – That’s a growth rate of about 0.01%/year

• Growth rate:
  – A growth rate of 0.25%/generation
  – For every 800 people in one generation, we have 802 in the next
    • A healthy settled population with ample food doubles every generation

• Life was nasty—and short
  – Life expectancy of 25?
  – Was it brutish?
The Bird’s Eye View: Agrarian Societies

• Population Status
  – Maybe 5M in 8200 BC?
  – Short: from 5’9” to 5’1”
    • Upper classes different
  – Lose your teeth
  – Petri dishes for bacteria
  – Maybe 750M by 1800

• Rule of 72:
  – That is a factor of 150—a little more than 7 doublings in 10000 years
  – A doubling every 1400 years
  – That’s a growth rate of 0.05%/year
  – That’s a growth rate of 1.25%/generation
    • A healthy settled population with ample food doubles every generation

• Life was brutish—and short
  – Life expectancy of 25?
  – And you are really bored...
Guessing at Some Numbers

- Growth rates of population
  - HG: 0.01%/year
  - AS: 0.05%/year
  - >1800: 1.0%/year

- Growth rates of technological and organizational knowledge
  - HG: ????
  - AS: 0.01%/year
  - EM: 0.09%/year
  - IS: 2%/year

- Growth rates of global GDP
  - AS: 0.05%/year
  - EM: 0.2%/year
  - EIS: 1.4%/year
  - IS: 3.4%/year
The Big Historical Questions

• What happened after 1800, and even more so after 1900?
  – We call it the Industrial Revolution

• What happened after 1500?
  – Not the market economy
  – Limited government
  – The Columbian Exchange

• What did not happen before 1500?
  – They were, after all, about as smart as we are...

• We are going to dodge the big historical questions
  – Simply note that they exist, and go on to describing what is
1800
The Great Divergence to 1968
Convergence to 2009
Why Divergence to 1968?

• The agrarian legacy
  – China’s population has grown by a factor of 7 since 1800
  – Egypt’s by a factor of 30
  – If most of your people are still unmechanized farmers, that is a huge set of headwinds

• The infrastructural task
  – Even if most of your people aren’t unmechanized farmers and live in cities, a rapid population growth rate means a large investment burden

• Difficulties of technology transfer

• Difficulties of government
  – Communism
  – Corruption
Why Convergence After 1968?

• End of High Communism
• Expansion of world trade
• Technology transfer
• But if you look at it, the big difference between before 1968 and after 1968 is the different destinies of two countries
  – China
  – India
  – If you count one-country-as-one, rather than one-person-as-one, it is hard to see a pattern
Factors of Production and Economic Growth

- Physical capital and resources (K)
- Labor (L)
- Human skills, acquired via education and experience (H)
- Factor income version of the circular flow:
  - $Y = rK + wL + sH$
- Difference it:
  - $\Delta Y = r(\Delta K) + w(\Delta L) + s(\Delta H)$
  - What would you expect an extra lathe to be worth? Well, about what the average lathe is worth.
  - Thus this equation tells you what you would expect the rate of economic growth to be as a result of factor accumulation
Factors of Production and Economic Incentives

• A growth equation:
  - $\Delta Y = r(\Delta K) + w(\Delta L) + s(\Delta H)$

• Incentives
  - Capital: incentives to save and invest
  - Skills: incentives to go to school, and to pay attention on the job

• Benefits of a private market system:
  - Pushes the decisions about factor accumulation out to the periphery
  - Gives people at the periphery the right incentives
The Solow Residual

• A growth equation:
  \[ \Delta Y = r(\Delta K) + w(\Delta L) + s(\Delta H) \]

• Plug in numbers for the U.S. today in an average year
  \[ \Delta Y/Y = (rK/Y)(\Delta K/K) + (wL/Y)(\Delta L/L) + (sH/Y)(\Delta H/H) \]
  \[ \Delta Y = (0.3)(3\%/\text{year}) + (0.3)(0.7\%/\text{year}) + (0.4)(1\%/\text{year}) \]
  \[ 3\%/\text{year} = \Delta Y/Y \neq r(\Delta K) + w(\Delta L) + s(\Delta H) = 1.5\%/\text{year} \]

• Half of all economic growth—2/3 of all growth in output per capita—does not come from factor accumulation, but from something else

• This is why Bob Solow won the Nobel Memorial Prize in Economic Sciences
Total Factor Productivity

• Sources of the Solow Residual
  – Technology
  – Business organization
  – Market organization

• And here we have a big incentive problem
  – Those who invent and innovate new technologies, new organizations, and new markets are enormous public benefactors
  – But they don’t get the rewards of what they do—the rewards spillover
  – Patents and copyrights
    • In the U.S. Constitution
    • Resolve the problem
    • But at the cost of creating another problem...
How Much Does TFP Matter?

• Go back to our historical guesses:
• Growth rates of technological and organizational knowledge
  – HG: ????
  – AS: 0.01%/year
  – EM: 0.09%/year
  – IR: 0.9%/year
  – MIS: 2%/year (world average)
Market Organization

• We have a “natural experiment”
• High Stalinist central planning
  – Marxian suspicion of markets
  – Hence we won’t have any
• Reproduce the Rathenau-Ludendorff World War I Imperial German war economy
  – Communes, economies of scale, GOSPLAN, etc.
  – Overall productivity? 20% of market economies
    • Military productivity is another story—at least during WWII
• You throw away a five-fold amplification of productivity by eschewing the market
  – Still, we have a 18-fold worldwide TFP gain since 1800
  – A 72-fold worldwide TFP gain since 8000 BC
Business Organization and Technology

• So mixed together that they are very hard to separate
• We have a 18-fold worldwide TFP gain since 1800.
  – If one doubling of that is due to “extent of the market,” then we have a 9-fold worldwide TFP gain from business organization and technology
• A 72-fold worldwide TFP gain since 8000 BC
  – If markets are responsible for a 5-fold increase, that gives us a 14-fold worldwide TFP gain from business organization and technology
• And if we could get everyone up to San Francisco Bay standards
  – That would be a further 7-fold amplification
Followership: The Importance of Institutions

China since 1975... And it is not coastal China...
Leadership: A Much Lower Speed Limit

- Silicon Valley
- Not just technologies, but technologies people would like to use
- Not just technologies people would like to use, but delivered at an affordable price
- Plus the innovators have to be able to make a profit
  - Without imposing very large restrictions on the social utility we derive from their innovations
  - Google Books...
Administrivia: The March to the Final

• M Apr 30: Review
  – Finish Problem Set 9!
  – Seabright essay question...

• M May 7: FINAL
  – 100 Haas Pavilion
  – 3-6 PM