Future Economic Growth and Innovation

Lee E. Ohanian
Professor of Economics - UCLA
Senior Fellow - Stanford University

Best of Breed Conference
Orlando, FL - October 14, 2014
Formula for Economic Growth

• Economic growth is *productivity growth* plus *growth in the percentage of population working*

• Productivity growth combines innovation, investment, & education/training: the main factor raising living standards

• Living standards have increase 8-fold since 1900 – virtually all from productivity growth

• Differences in living standards across countries entirely due to productivity differences in workers
The U.S. Economy is far below trend. Real GDP per capita has been stable since 2007-Q4 with a 2% annual growth trendline.

- 2007-Q4 = 100

<table>
<thead>
<tr>
<th>Year</th>
<th>Real GDP Per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>95.0</td>
</tr>
<tr>
<td>2003</td>
<td>97.2</td>
</tr>
<tr>
<td>2004</td>
<td>99.0</td>
</tr>
<tr>
<td>2005</td>
<td>101.0</td>
</tr>
<tr>
<td>2006</td>
<td>103.0</td>
</tr>
<tr>
<td>2007</td>
<td>105.0</td>
</tr>
<tr>
<td>2008</td>
<td>107.0</td>
</tr>
<tr>
<td>2009</td>
<td>109.0</td>
</tr>
<tr>
<td>2010</td>
<td>111.0</td>
</tr>
<tr>
<td>2011</td>
<td>113.0</td>
</tr>
<tr>
<td>2012</td>
<td>115.0</td>
</tr>
<tr>
<td>2013</td>
<td>117.0</td>
</tr>
<tr>
<td>2014</td>
<td>119.0</td>
</tr>
</tbody>
</table>
Future Growth May Remain Weak

- Declining employment & labor force participation
  - Not just demographics of an aging population
- Declining productivity growth
  - Entrepreneurship has been declining since 1980s
  - US educational attainment is low and many countries now have better-trained workers in STEM areas
  - Business investment is 20 percent below trend
- Tax increases are likely to deal with rising US gov’t liabilities (entitlements, unfunded pensions...)
Employment Has not Recovered
Employment Has not Recovered

Employment per Working Age Population (16-64)

- TARP (Sept-08)
- QE 1 (Nov-08)
- ARRA (Feb-09)
- New Homebuyer Tax Credit (Apr-09)
- Cash for Clunkers (Jul-09)
- QE 2 (Nov-10)
- Payroll Tax Holliday (Dec-10)
- QE 3 (Sept-12)
- QE 4 (Dec-12)
Employment Trends: Men & Youth Declining, Women Peaking

• Prime-Age Men (25-54 yrs.)
  – Employment/Population Ratio 95% in 1968 to 82% in 2013

• Youth (16 – 24 yrs.)
  – Employment/Population Ratio 65% in 1988 to 46% in 2013. Only about 1/3 of this decline is accounted for by increased school participation

• Women (20 yrs. and older)
  – Labor Force Participation rose from 35% in 1968 to 58% in 2000, and declined to 54% in 2013
Productivity is Well Below Trend
Entrepreneurship is Declining

• New business formation rate is down 35%
• Lower startup rate in every state
• Take away startups, & net employment growth for all other employers is negative in most years
• 2/3 of gross job creation is by startups and small businesses growing more than 25% per year
• Small businesses are key for innovation: airplane, autos, A/C, computer, many internet applications, electrification, railroads, refrigeration, telephone, frozen foods, all by entrepreneurs
A Few Startups will become Tomorrow’s Economic Giants

• Businesses have a *life-cycle*
• Grow quickly, mature, then decline
• Half of *Fortune 500* exit list every 10 years, as new ideas create businesses that supplant incumbents
• A few reinvent themselves (IBM, GE), most decline substantially (GM, Digital Equipment, IT & T, Kodak)
• New leaders: Walmart, Costco, Apple, Microsoft, Amazon, Intel, Google, Sysco, Oracle, Fedex
• Key question: Which of today’s small businesses will be tomorrow’s leaders?
Why has Entrepreneurship Declined?

• Less competitive business climate
• US is now outside top 10 countries in economic freedom (#17 worldwide)
• Regulation, tax code, difficulty in financing
• City of Los Angeles is microcosm of this
• LA employment down 4% in last 25 years
• Very high taxes, license fees, regulations,...
Policy Solutions to Increase Entrepreneurship and Innovation

• Successful entrepreneurs are disproportionately immigrants
• 50% of tech startups are founded by an immigrant
• 40% of Fortune 500 are founded by immigrant or child of immigrant
• Difficult for skilled immigrants and entrepreneur immigrants to stay in US
• Immigration restrictions are from 1980s – several reform proposals in Wash DC, but no action yet
US Education Attainment is Declining

- US - highest education attainment in world for much of 20th century - key contributor to US economic success
- US is now 34th out of 44 countries in math proficiency
- US math proficiency on par with Slovenia, Serbia,...
- Only 24% are proficient in California, 30% in New York...
- Students in top state - 2 grade years behind Chinese students
- U.S. dropped from #1 to #16 in college completion rate
- Most community college students do not finish
The Debate About Future Innovation: *Naysayers*

- Say future innovations will not be as important as:
  - Personal computing, internet, e-commerce, Wi-Fi
  - Cell technology, smart phones, tablets
  - Digitization of print material
  - Instant & low cost access to global knowledge
  - Scanning, ATMs, MP3, DVDs, streaming
  - Just in time inventory control
The Debate About Future Innovation: *Optimists*

- Say we have just scratched the surface!
  - Big data
  - Artificial intelligence and robotics
  - Expanding cloud computing
  - Expanding 3D printing
  - Virtual reality
  - Genome mapping therapeutic advances
  - Superior management/production of natural resources
  - Potential for China, India, Latin America to grow and create enormous new markets (Africa?)
Innovation and the Scarcity of Time

• For many, *time* is the scarcest resource
• Many valuable innovations share one or more of the following features:
  • *Conserve time* (labor saving technologies)
  • *Raise the value of time* (technologies that raise individual productivity/efficiency)
  • *Enhance the quality of time* (medical advances)
• Time scarcity will become even more acute as economy grows
Summary and Conclusions

• Economic growth is below normal, because productivity growth is low and employment is low
• Main suspect: Drop in new business formation
• What to look for in future?
• Follow changes in productivity, capital investment, & changes in policies that impact productivity – immigration reform, tax reform, trade agreements
• Key positive for US: population will continue to grow, as Japan and Europe populations decline