AMERICAN DEMOGRAPHY - BIRTHS, DEATHS AND HEALTH
The growth of output per capita is equal to the growth of output minus population growth.

<table>
<thead>
<tr>
<th></th>
<th>Per Capita Growth</th>
<th>Output Growth</th>
<th>Population Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1790-1840</td>
<td>1.00%</td>
<td>4.00%</td>
<td>3.00%</td>
</tr>
<tr>
<td>1840-1910</td>
<td>1.25%</td>
<td>3.75%</td>
<td>2.50%</td>
</tr>
</tbody>
</table>

So, population’s role in or share of economic growth has been declining over time.
Some population figures:

- 1700 - 250,000
- 1776 – 2.5 million
- 1860 – 31 million
- 1914 – 100 million
- 2010 – 310 million
- 2013 (July) - 316 million

How do we explain the trends?
How do we explain the trends?

Fertility and Mortality

- **Births:**
  - Earlier marriage in US than Europe in the 18th & 19th centuries - higher fertility
  - 1800 birth rate near the natural limit - 60 per 1000
  - 1870 birth rate 40 per 1000
  - 1915 birth rate 30 per 1000
Over time the birth rates have come down: Why?

1) Urbanization increased with the closing of frontier, less cheap land
   - Children less valuable in production

Evidence: post civil war –
   - Children were a net asset in the mid west
   - Children in the frontier were a liability to age 6 but a net contributor by about 10
   - Children in the northeast were a net liability to 13.

In rural areas children becoming less valuable in production - mechanization
Over time the birth rates have come down: Why?

- **2) Infant mortality way down**
  - Normally do not have a second child while the first is nursing. Delay between children increases with survival of a child.
  - Target family size - if remained constant need fewer births

- **3) Later marriage from the late 19th century.**

- **4) Increasing divorce in the 20th century**

- **5) Better contraception from the 20th century**
Death Rates: increase in mortality
1820 to 1870

- Increase in urban population - worse nutrition and disease environment
- Decline in Death Rates after Civil War
  - 1850 - life expectation for males; 41
  - 1915 - life expectation for males; 53
  - 1870 - Death Rate 23 per 1000
  - 1915 - Death Rate 15 per 1000
- What killed folks early on? Infectious Diseases
- Later: heart disease and old age (pneumonia)
- Even later today: add cancer
Determinants of health:

- 1) genetic changes in virulence of disease organisms perhaps accounts for 5% of decline - scarlet fever and diphtheria
- 2) improved medical practice: only in 20th century with antibiotics and improved knowledge
- 3) Improved nutrition and overall level of living - market influences
  - Improved urban conditions - sewerage (reduced epidemics ex: typhoid), heating, less crowding, better transport (fresh foods), replacement of horses with motorized transport
- Improved rural conditions - mostly nutrition due to income and lower transportation (refrigerated rail cars)
4) Improvements in public health and regulation
   – only urban: government influence
   □ late 19th Century better knowledge of disease transmission
Filtration of water dramatically affected deaths from Typhoid

<table>
<thead>
<tr>
<th>City</th>
<th>Avg Death Rates (per 100,000)</th>
<th>% Fall in Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Filtration</td>
<td>After Filtration</td>
<td></td>
</tr>
<tr>
<td>Albany</td>
<td>109</td>
<td>28</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>56</td>
<td>11</td>
</tr>
<tr>
<td>Indianapolis</td>
<td>46</td>
<td>28</td>
</tr>
<tr>
<td>New Orleans</td>
<td>39</td>
<td>26</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>132</td>
<td>19</td>
</tr>
<tr>
<td>Washington D.C.</td>
<td>55</td>
<td>31</td>
</tr>
<tr>
<td>Weighted Avg</td>
<td>60</td>
<td>21</td>
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Remaining Problem: lead pipes