Great Depressions of the Twentieth Century

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Real GDP per Capita in the United States

(index (1900=100)

year

Great Depressions of the Twentieth Century Project

Use growth accounting and applied dynamic equilibrium models to reexamine great depression episodes:

United Kingdom (1920s and 1930s) — Cole and Ohanian
Canada (1930s) — Amaral and MacGee
France (1930s) — Beaudry and Portier
Germany (1930s) — Fisher and Hornstein
Italy (1930s) — Perri and Quadrini
Argentina (1970s and 1980s) — Kydland and Zarazaga
Chile and Mexico (1980s) — Bergoeing, Kehoe, Kehoe, and Soto
Japan (1990s) — Hayashi and Prescott

(Review of Economic Dynamics, January 2002 revised and expanded version forthcoming as Minneapolis Fed volume)
Great Depressions Methodology


Aggregate production function:

\[ Y_t = A_t K_t^\alpha L_t^{1-\alpha}. \]

When \( A_t = A_0 g^{(1-\alpha)t} \), output per capita grows at constant rate \( g - 1 \).

Measure output growth with respect to this trend.
- Trend growth represents the stock of useable production knowledge growing smoothly over time.
- This knowledge is not country specific.
- Countries grow at the same rate, $g - 1$, on different balanced growth paths.
- Levels differ across countries because institutions are different.
- Changing institutions moves the country to a different balanced growth path.
- Take $g - 1$ to be growth rate of the industrial leader – United States.

$$g = 1.02$$
Growth Accounting

\( Y_t \) : real GDP (national income accounts)
\( X_t \) : real investment (national income accounts)
\( L_t \) : hours worked (labor surveys)

Construct Capital Stocks:

\[
K_{t+1} = (1 - \delta)K_t + X_t
\]

Total factor productivity is the residual:

\[
A_t = \frac{Y_t}{K_t^\alpha L_t^{1-\alpha}}
\]

\[\delta = 0.05 \quad \alpha = 0.30\]
Decomposing Changes in GDP per Working-Age Person

\[
\log \left( \frac{Y_t}{N_t} \right) = \frac{1}{1-\alpha} \log \left( A_t \right) + \frac{\alpha}{1-\alpha} \log \left( \frac{K_t}{Y_t} \right) + \log \left( \frac{L_t}{N_t} \right)
\]

Traditional theories of depressions stress declines in the capital stock or in hours worked as the most important factors in accounting for depressions.
Lessons from Great Depressions Project

• The main determinants of depressions are not drops in the inputs of capital and labor — stressed in traditional theories of depressions — but rather drops in the efficiency with which these inputs are used, measured as total factor productivity (TFP).

• Exogenous shocks like the deteriorations in the terms of trade and the increases in foreign interest rates that buffeted Chile and Mexico in the early 1980s can cause a decline in economic activity of the usual business cycle magnitude.

• Misguided government policy can turn such a decline into a severe and prolonged drop in economic activity below trend — a great depression.
Growth Accounting for the United States 1960-2000

\[
\frac{Y_t}{N_t}
\]

\[
\frac{1}{A_t^{1-\alpha}}
\]

\[
\left(\frac{K_t}{Y_t}\right)^\frac{\alpha}{1-\alpha}
\]

\[
\frac{L_t}{N_t}
\]
Growth Accounting for Spain 1960-2000

The graph illustrates the index of growth accounting for Spain from 1960 to 2000. The indices are labeled as follows:

- \( \frac{1}{A_t^{1-\alpha}} \)
- \( \frac{Y_t}{N_t} \)
- \( \left( \frac{K_t}{Y_t} \right)^{\alpha} \)
- \( \frac{L_t}{N_t} \)

The years are marked from 1960 to 2000 on the x-axis, and the index values range from 50 to 400 on the y-axis.