La Crisis Financiera Actual:
¿Qué Debemos Aprender de las Grandes Depresiones del Siglo XX?

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Great Depressions of the Twentieth Century Project

Timothy J. Kehoe and Edward C. Prescott

www.greatdepressionsbook.com


*Great Depressions of the Twentieth Century*, July 2007.
15 studies by 26 researchers using the same methodology

**Great depressions**

**1930s**
United States, United Kingdom, Canada, France, Germany

**Contemporary**

**Not-quite-great depressions**
Italy (1930s), Finland (1990s), Japan (1990s)
Kehoe and Prescott define a great depression to be a large negative deviation from balanced growth.

They set the growth rate in the balanced growth path to be 2 percent per year, the growth rate of output per working-age person in the United States during the twentieth century.
Trend growth:

\[ \hat{y}_t^i = y_t \hat{y}_0^i, \quad y = 1.02 \]

Great depression:

\( D = [t_0, t_1] \) such that

1. There is some \( t \) in \( D \) in such that
\[
\left[ y_t^i / \left( y^{t-t_0} \hat{y}_{t_0}^i \right) \right] - 1 \leq -0.20.
\]

2. There is some \( t \leq t_0 + 10 \) such that
\[
\left[ y_t^i / \left( y^{t-t_0} y_{t_0}^i \right) \right] - 1 \leq -0.15.
\]

3. There are no \( t_1, t_2 \) in \( D \), \( t_2 \geq t_1 + 10 \), such that
\[
\left[ y_{t_2}^i / \left( y^{t_2-t_1} y_{t_1}^i \right) \right] - 1 \geq 0.
\]
Great depressions in the 1930s:
Detrended output per person

Index (1928 = 100)

France
Germany
United States
Canada

1928 1930 1932 1934 1936 1938
Great depressions in the 1980s:
Detrended output per working-age person
Great depressions methodology

Crucial elements: Growth accounting and dynamic general equilibrium model

Growth accounting decomposes changes in output per working-age person into three factors:

- a productivity factor
- a capital factor
- an hours-worked factor
Great depressions methodology

Crucial elements: Growth accounting and dynamic general equilibrium model

Growth accounting decomposes changes in output per working-age person into three factors:

- a productivity factor
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Keynesian analysis stresses declines in inputs of capital and labor as the causes of depressions.
Balanced growth path

In the dynamic general equilibrium model, if the productivity factor grows at a constant rate, then

the capital factor and the hours-worked factor stay constant and

growth in output is due to growth in the productivity factor.

Twentieth century U.S. macro data are very close to a balanced growth path, with the exception of the Great Depression and the subsequent World War II build-up.
Balanced growth path

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

When \( A_{t+1} = g^{1-\alpha} A_t \)

- \( \frac{K_t}{Y_t} \) and \( \frac{L_t}{N_t} \) are constant
- \( \frac{Y_t}{N_t} \) grows at rate \( g - 1 \), assume \( g - 1 = 0.02 \) as in U.S.
Growth accounting for the United States

index (1929=100)

1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939

- capital
- productivity
- output
- hours worked
We use a dynamic general equilibrium model to model the responses of households and firms — in terms of capital accumulation and hours worked — to changes in productivity and changes in government policy.

We take the path of the productivity factor as exogenous.

Comparing the results of the model with the data, we can identify features of the depression that need further analysis.
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 Mexico

Index (1980 = 100)

- Capital
- Hours
- Output
- Productivity
A Decade Lost and Found: Mexico and Chile in the 1980s

Raphael Bergoeing, Patrick J. Kehoe, Timothy J. Kehoe, and Raimundo Soto

Similar crises in 1981-1983
  • more severe in Chile than in Mexico

Different recoveries
  • much faster in Chile than in Mexico

Why different pattern?
Real GDP per working-age (15-64) person detrended by 2 percent per year

Chile

Mexico
Growth accounting and applied dynamic general equilibrium model

Two numerical experiments with model:

Base case model: takes series for productivity factor as given.

Model with tax reform: takes series for productivity factor as given and imposes tax reform that lowers tax on capital income in 1988 in both countries.
Applied dynamic general equilibrium model

The representative consumer maximizes

\[ \sum_{t=1980}^{\infty} \beta^t \left[ \gamma \log C_t + (1-\gamma) \log(\tilde{h}N_t - L_t) \right] \]

subject to

\[ C_t + K_{t+1} - K_t = w_t L_t + (1 - \tau_t)(r_t - \delta)K_t + T_t \]

where \( T_t = \tau_t (r_t - \delta)K_t \) is a lump-sum transfer.

Feasibility:

\[ C_t + K_{t+1} - (1 - \delta)K_t = A_t K_t^\alpha L_t^{1-\alpha}. \]
Calibration

First order conditions:

\[
\frac{1}{C_{t-1}} = \frac{\beta}{C_t} \left[ 1 + (1 - \tau_t)(r_t - \delta) \right]
\]

\[
\frac{1 - \gamma}{hN_t - L_t} = \frac{\gamma w_t}{C_t}.
\]

Look at 1960-1980 data

\[
\beta = 0.98, \quad \tau = 1 - \frac{C_t - \beta C_{t-1}}{(r_t - \delta)C_{t-1}} \quad \Rightarrow \quad \tau = 0.45 \text{ in Mexico, } \tau = 0.56 \text{ in Chile;}
\]

\[
\gamma = \frac{C_t}{C_t + w_t(hN_t - L_t)} \quad \Rightarrow \quad \gamma = 0.30 \text{ in Mexico, } \gamma = 0.28 \text{ in Chile}.
\]
Numerical experiments

Base case:

\( \tau_t = 0.45 \) in Mexico, \( \tau_t = 0.56 \) in Chile, 1980-2000.

Tax reform:

\( \tau_t = 0.45 \) in Mexico, \( \tau_t = 0.56 \) in Chile, 1980-1988;

\( \tau_t = 0.12 \) in Mexico, \( \tau_t = 0.12 \) in Chile, 1988-2000.
Detrended real GDP per working-age person and productivity factor

Chile output

Chile productivity

Mexico output

Mexico productivity
Detrended real GDP per working-age person: base case model

Chile data
Chile model
Mexico data
Mexico model
Detrended real GDP per working-age person: model with tax reform

Chile model  
Chile data  
Mexico data  
Mexico model
What do we learn from growth accounting and numerical experiments?

Nearly all of the differences in the recoveries in Mexico and Chile result from different paths of productivity.

Tax reforms are important in explaining some features of the recoveries, but not the differences.

Implications for studying structural reforms story:

- Only reforms that are promising as explanations are those that show up primarily as differences in productivity, not those that show up as differences in factor inputs.

- Timing of reforms is crucial if they are to drive the differences in economic performance.
Fiscal reforms

Chile:
- tax reforms 1975, 1984
- social security reform 1980
- fiscal surpluses

Mexico:
- fiscal deficits

Important, but not for explaining the differences!
Trade reforms

Chile: by 1979
- all quantitative restrictions eliminated
- uniform tariff of 10 percent
- tariff hikes during crisis — tariff back below 10 percent in 1991

Mexico: in 1985
- 100 percent of domestic production protected by import licenses
- nontariff barriers and dual exchange rates

Massive trade reforms in Mexico 1987-1994, culminating in NAFTA

Timing seems wrong!
Privatization

Chile

- major privatizations 1974-1979

Mexico

- major nationalization 1982
  - expropriated banks’ holdings of private companies
  - government controlled 60-80 percent of GDP
- major privatizations after 1989

Timing seems wrong?
Banking

Chile: 1982 and after
- took over failed banks
- market-determined interest rates
- lowered reserve requirements.

Mexico: 1982 and after
- nationalized all banks
- government set low deposit rates
- 75 percent of loans either to government or directed by government.
Bankruptcy laws

Chile had reformed the administration of its bankruptcy procedures in 1978. In 1982 it reformed its bankruptcy laws to look much like those in the United States.

Mexico reformed its bankruptcy procedures in a similar way only in 2000. (Maybe not so similarly!)
Business bankruptcies in Chile

![Business bankruptcies in Chile graph](image-url)