

**The Debt Crisis in Europe:
How Did We Get Here and How Can We Get Out?**

Timothy J. Kehoe

**University of Minnesota
and Federal Reserve Bank of Minneapolis**

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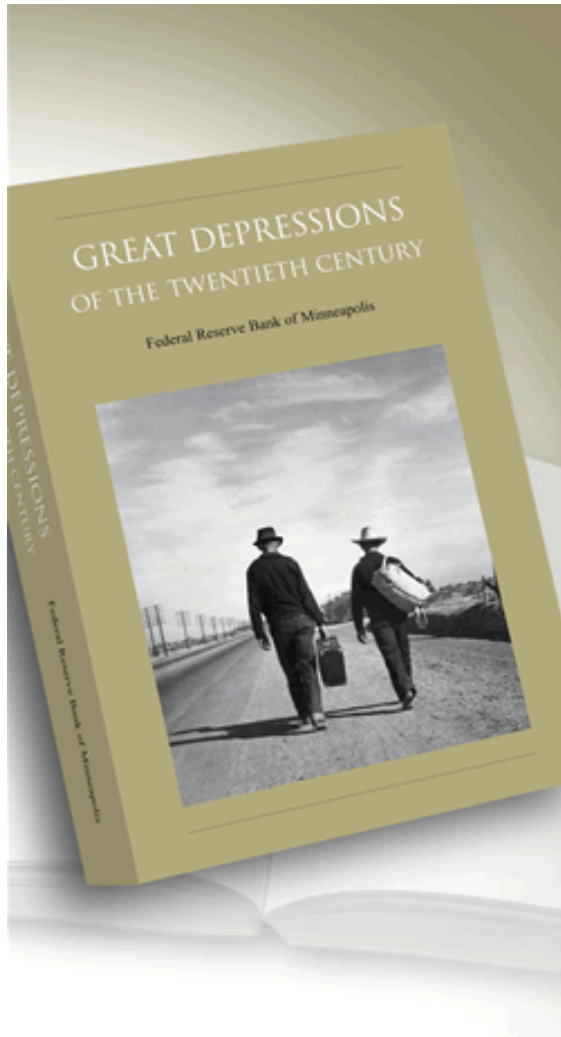
www.econ.umn.edu/~tkehoe

What is a great depression? Is Europe in a great depression?

Why is the debt crisis in Europe continuing?

How can we emerge from the debt crisis and restart growth?

What is a great depression? Is Europe in a great depression?



Great Depressions of the Twentieth Century Project

Timothy J. Kehoe and
Edward C. Prescott

www.greatdepressionsbook.com

Cole and Ohanian, “The Great Depression in the United States from a Neoclassical Perspective,” *Federal Reserve Bank of Minneapolis Quarterly Review*, Winter 1999.

Federal Reserve Bank of Minneapolis Conference, October 2000.

Special Issue of *Review of Economic Dynamics*, January 2002.

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

Argentina (1970s and 1980s), Chile and Mexico (1980s), Brazil (1980s and 1990s), New Zealand and Switzerland (1970s, 1980s, and 1990s), Argentina (1998-2002)

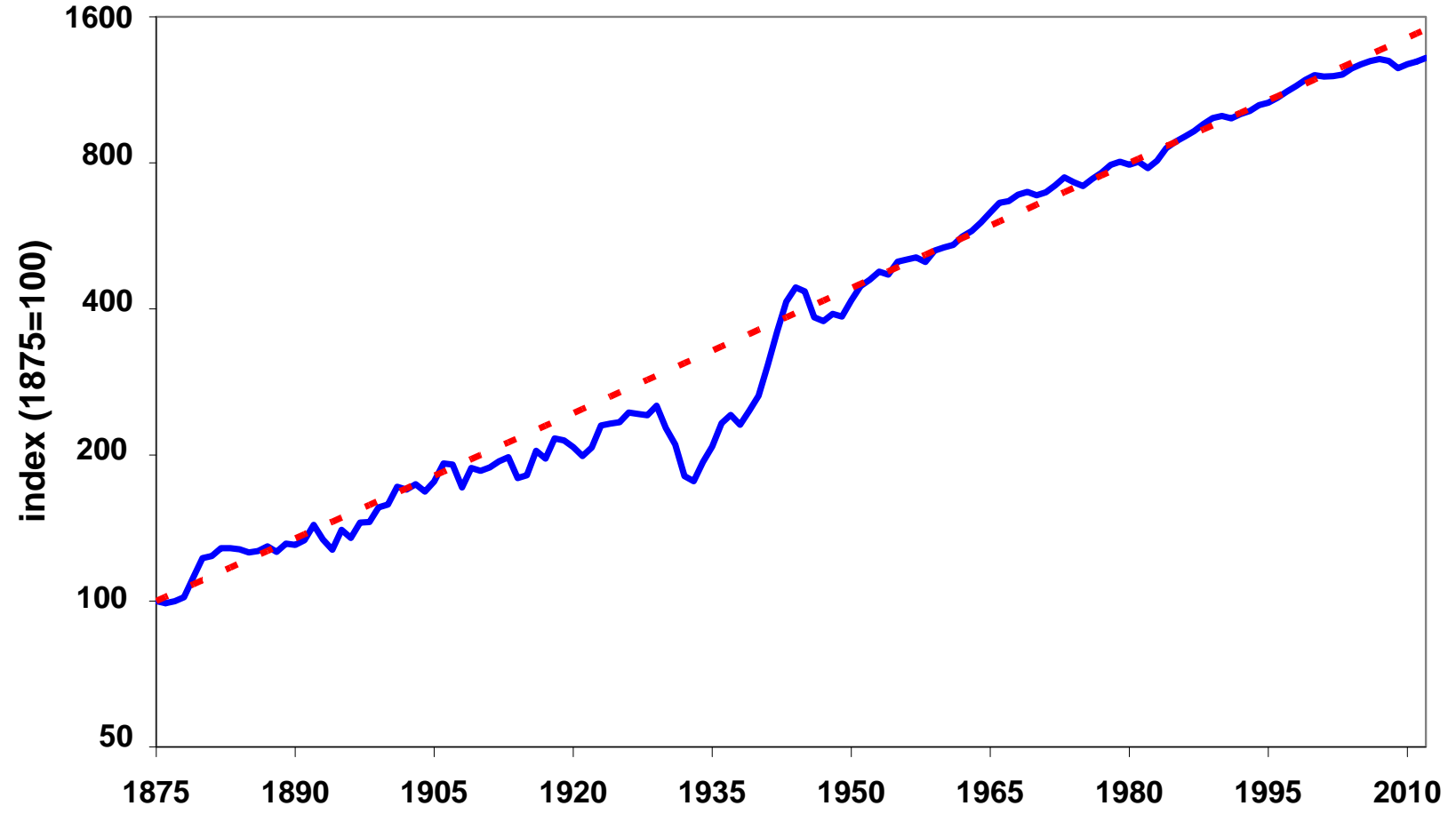
Not-quite-great depressions

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.

Real GDP per working-age person in the United States



Trend growth:

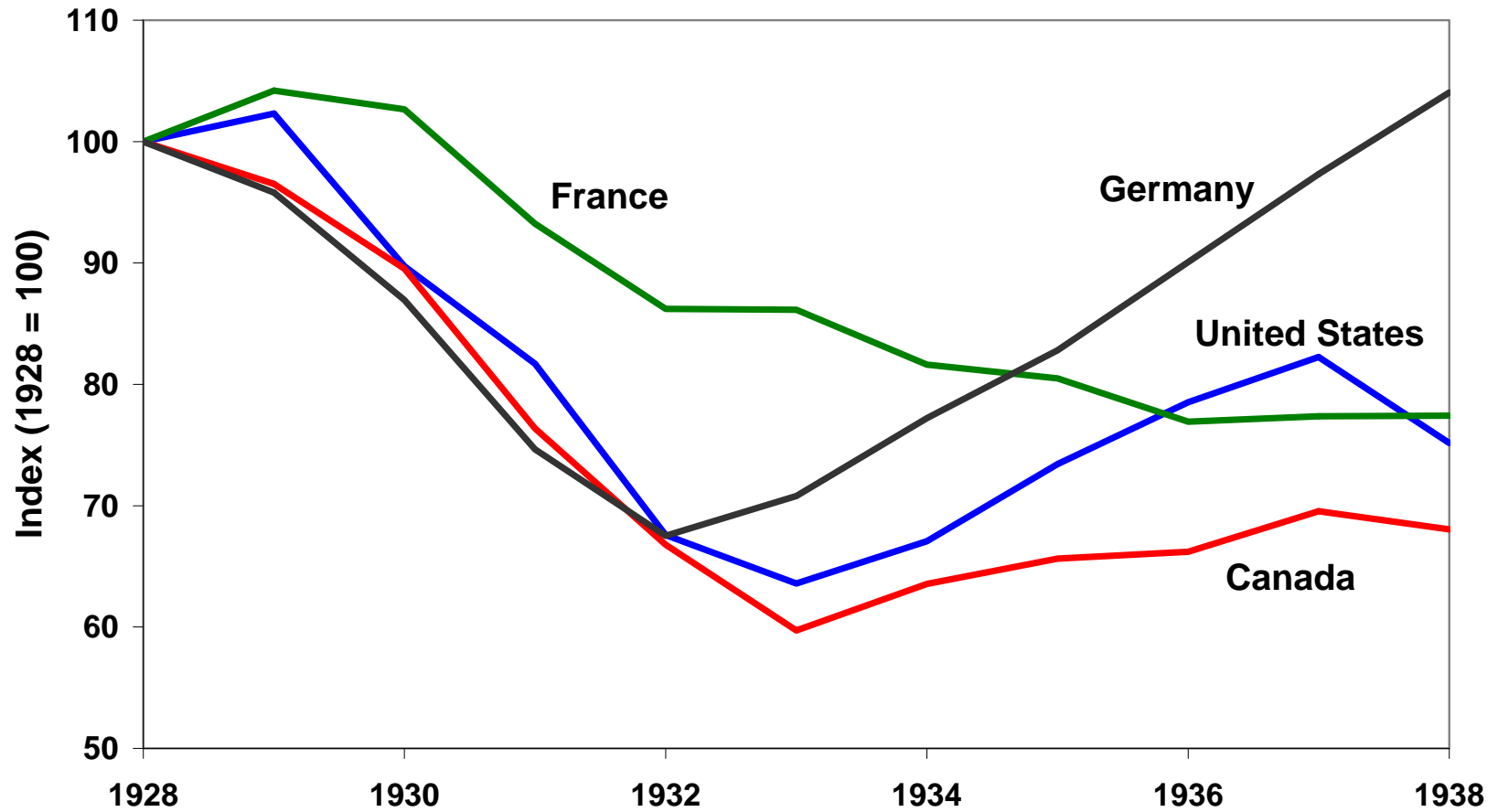
$$\hat{y}_t^i = \gamma^t \hat{y}_0^i, \gamma = 1.02$$

Great depression:

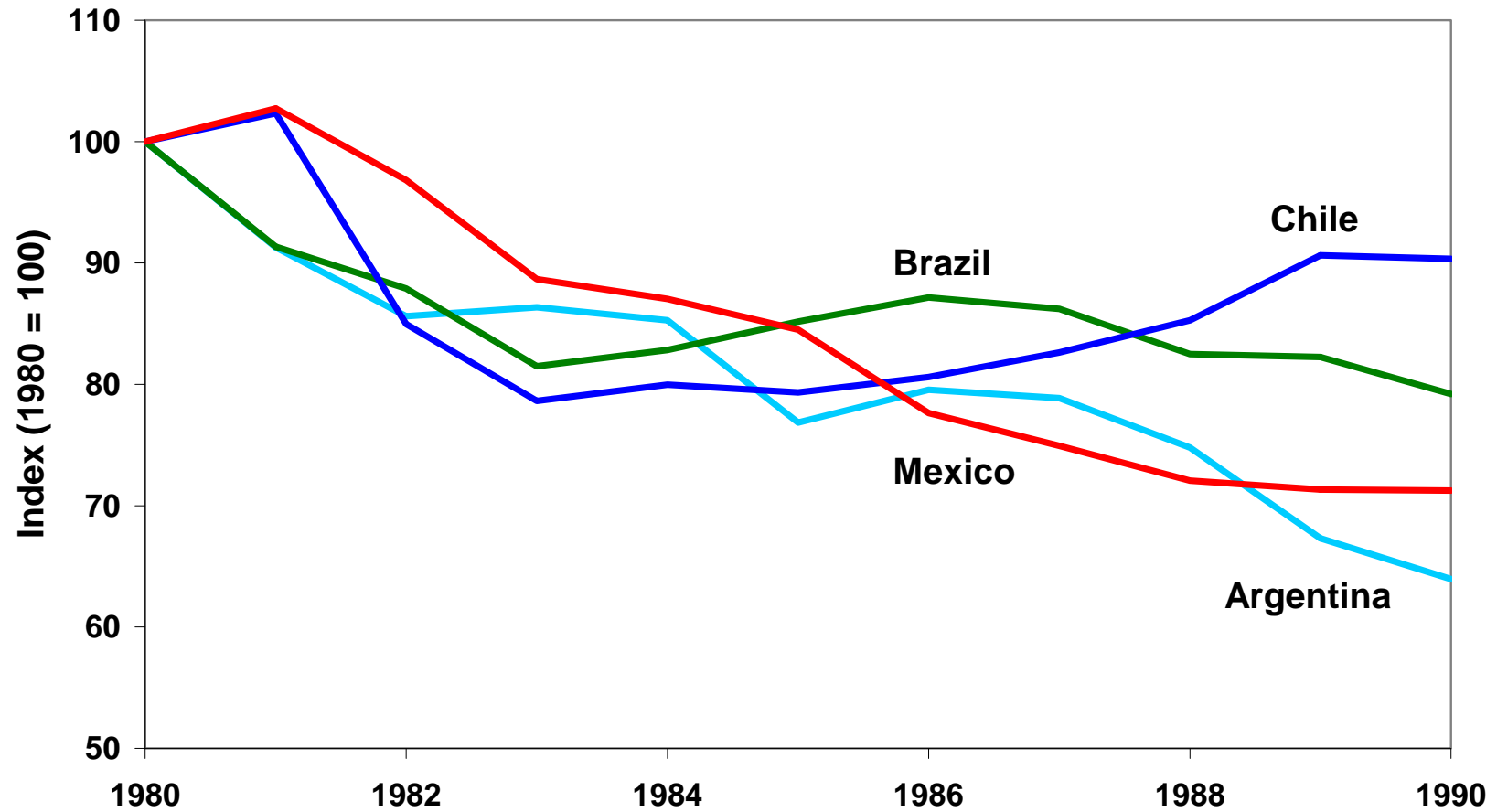
$D = [t_0, t_1]$ such that

1. There is some t in D in such that $\left[y_t^i / \left(\gamma^{t-t_0} \hat{y}_{t_0}^i \right) \right] - 1 \leq -0.20$.
2. There is some $t \leq t_0 + 10$ such that $\left[y_t^i / \left(\gamma^{t-t_0} y_{t_0}^i \right) \right] - 1 \leq -0.15$.
3. There are no t_1, t_2 in D , $t_2 \geq t_1 + 10$, such that $\left[y_{t_2}^i / \left(\gamma^{t_2-t_1} y_{t_1}^i \right) \right] - 1 \geq 0$.

Great depressions in the 1930s: Detrended output per person



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

Aggregate production function:

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

Growth accounting:

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

output = productivity \times capital \times labor

Great depressions methodology

Crucial elements: Growth accounting and dynamic general equilibrium model

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- a productivity factor
- a capital factor
- an hours-worked factor

Keynesian analysis stresses declines in inputs of capital and labor as the causes of depressions.

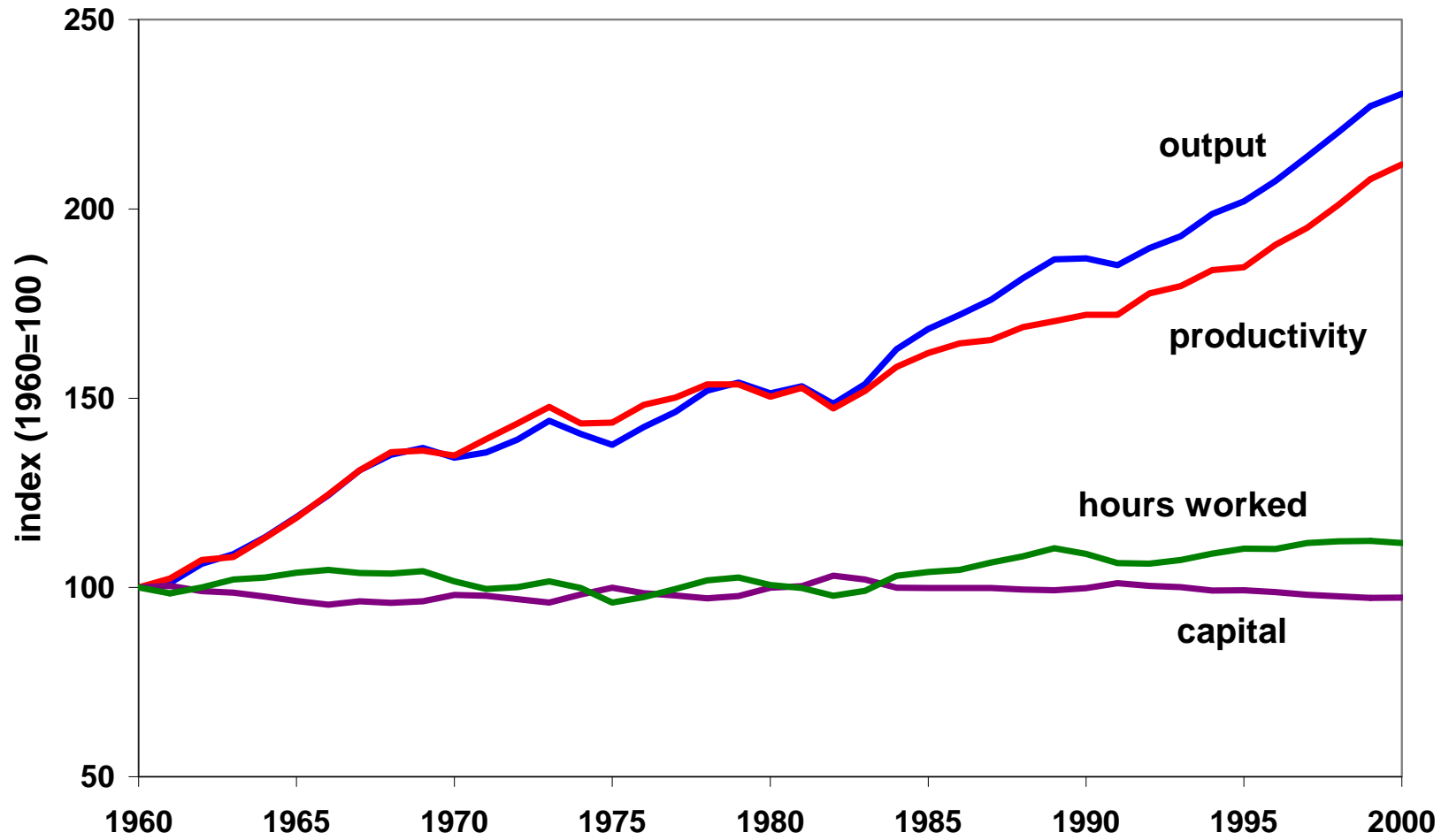
Balanced growth path

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

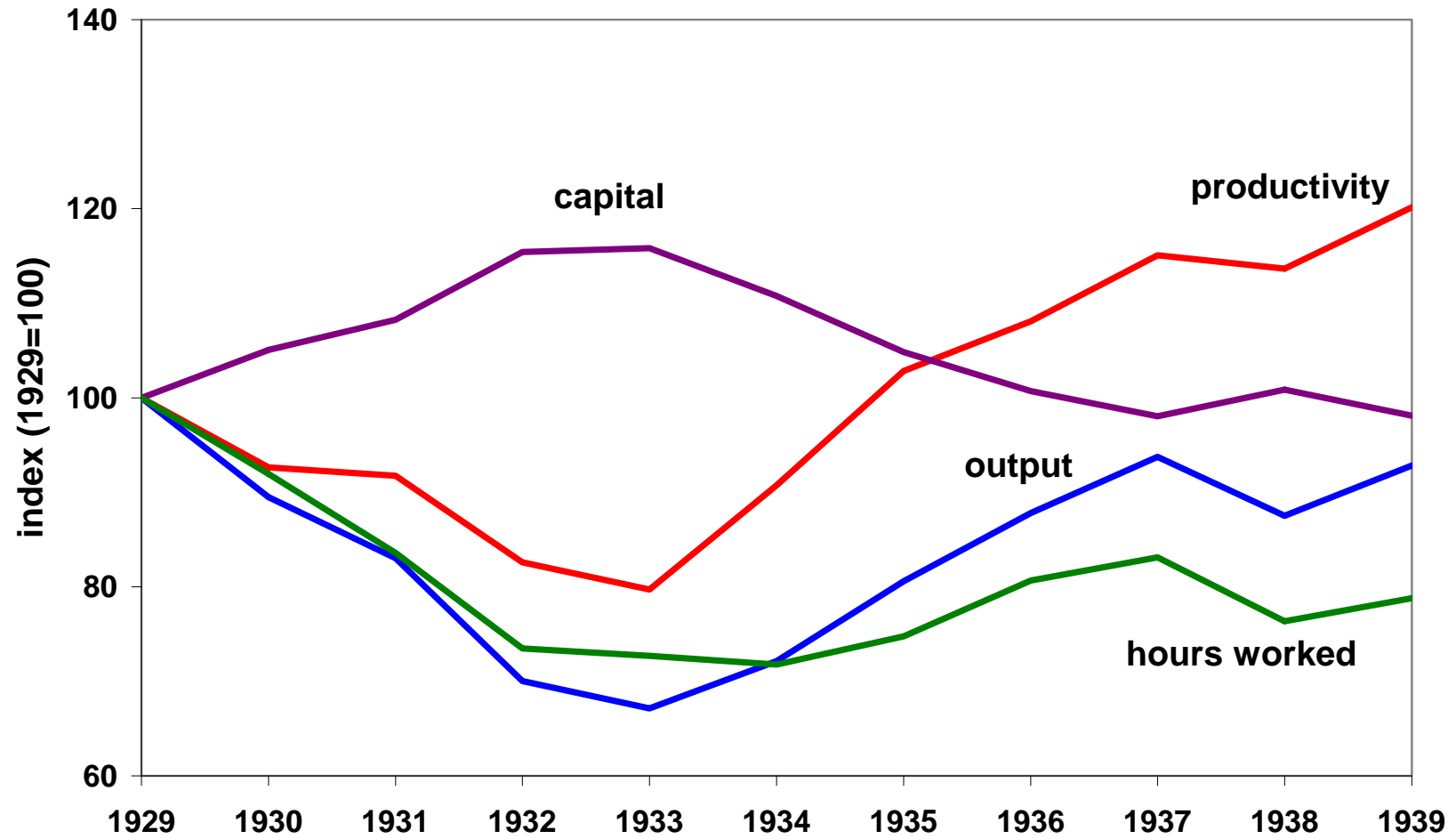
the capital factor and the hours-worked factor stay constant and growth in output is due to growth in the productivity factor.

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.

Growth accounting for the United States

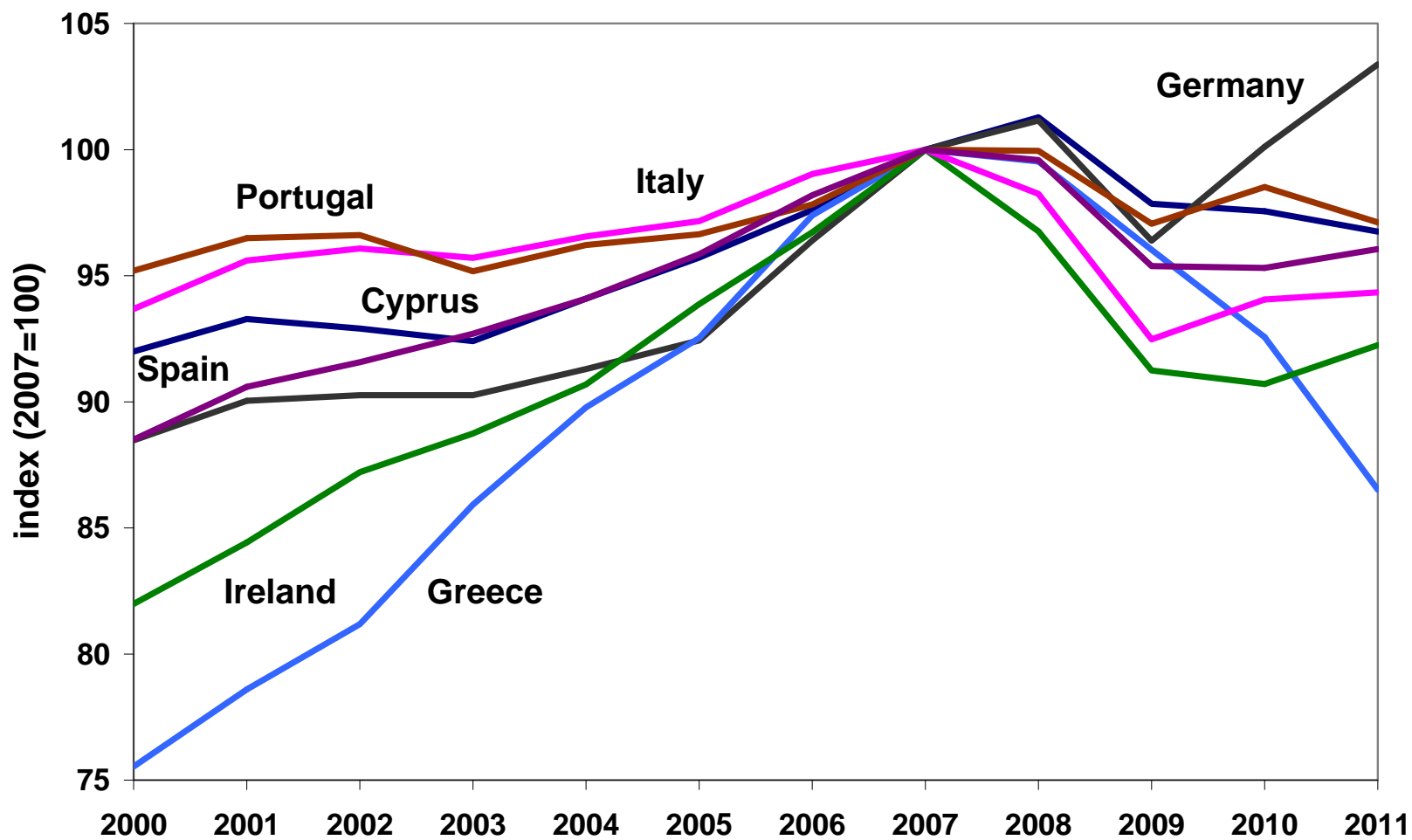


Growth accounting for the United States

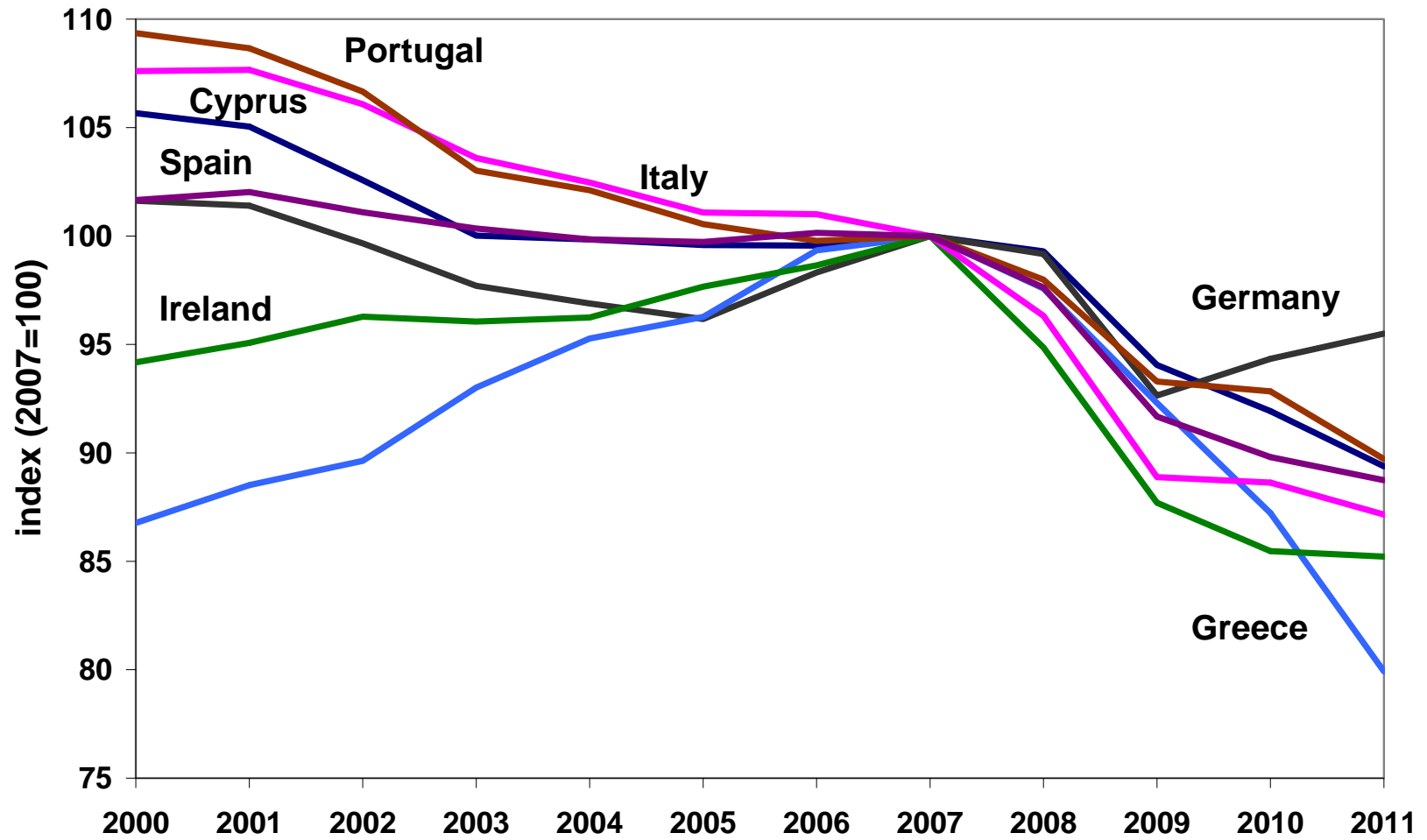


Studying the experience of countries that have experienced great depressions during the twentieth century teaches us that massive public interventions in the economy to maintain employment and investment during a financial crisis can, if they distort incentives enough, lead to a great depression.

Real GDP per working-age person in Europe

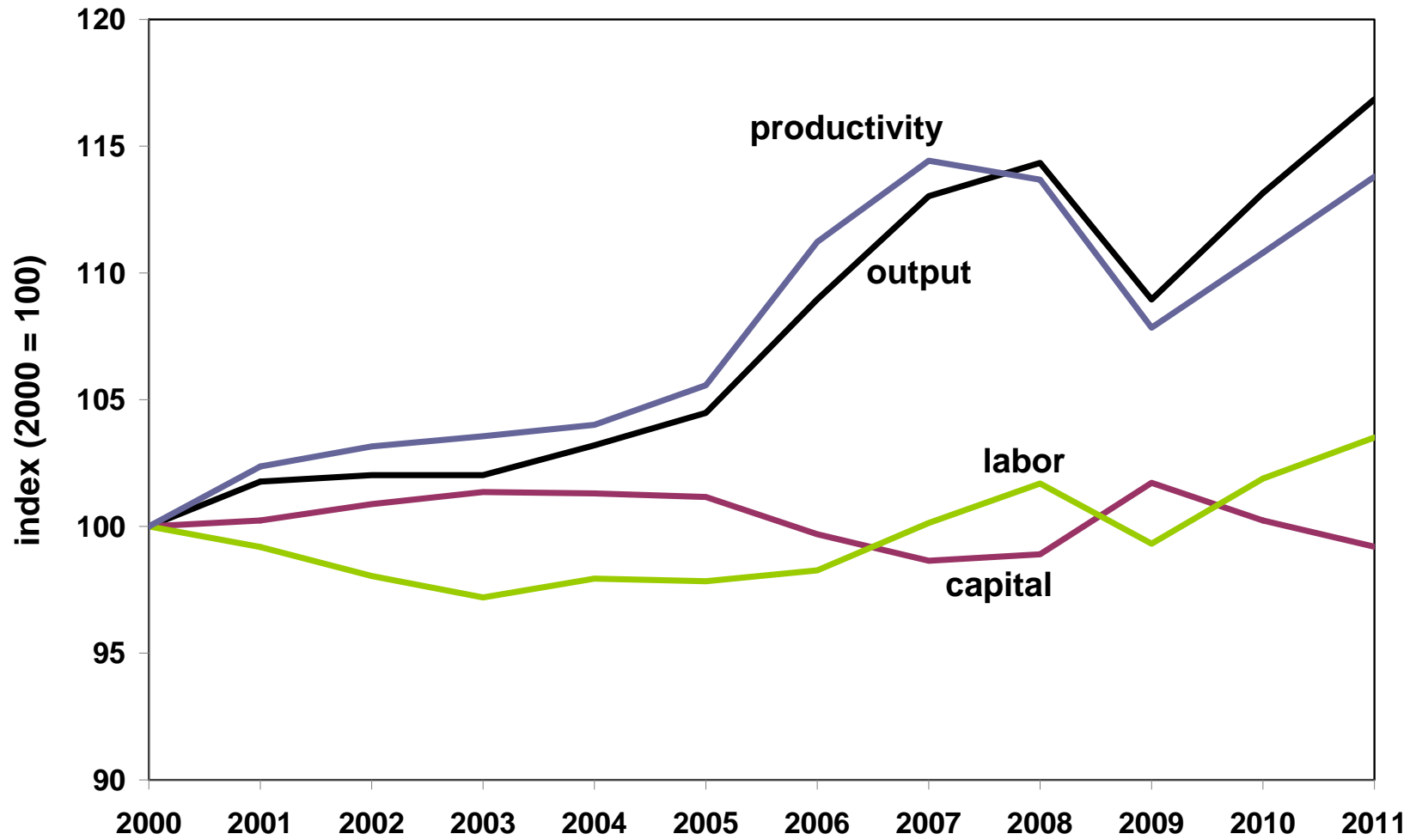


Detrended real GDP per working-age person in Europe

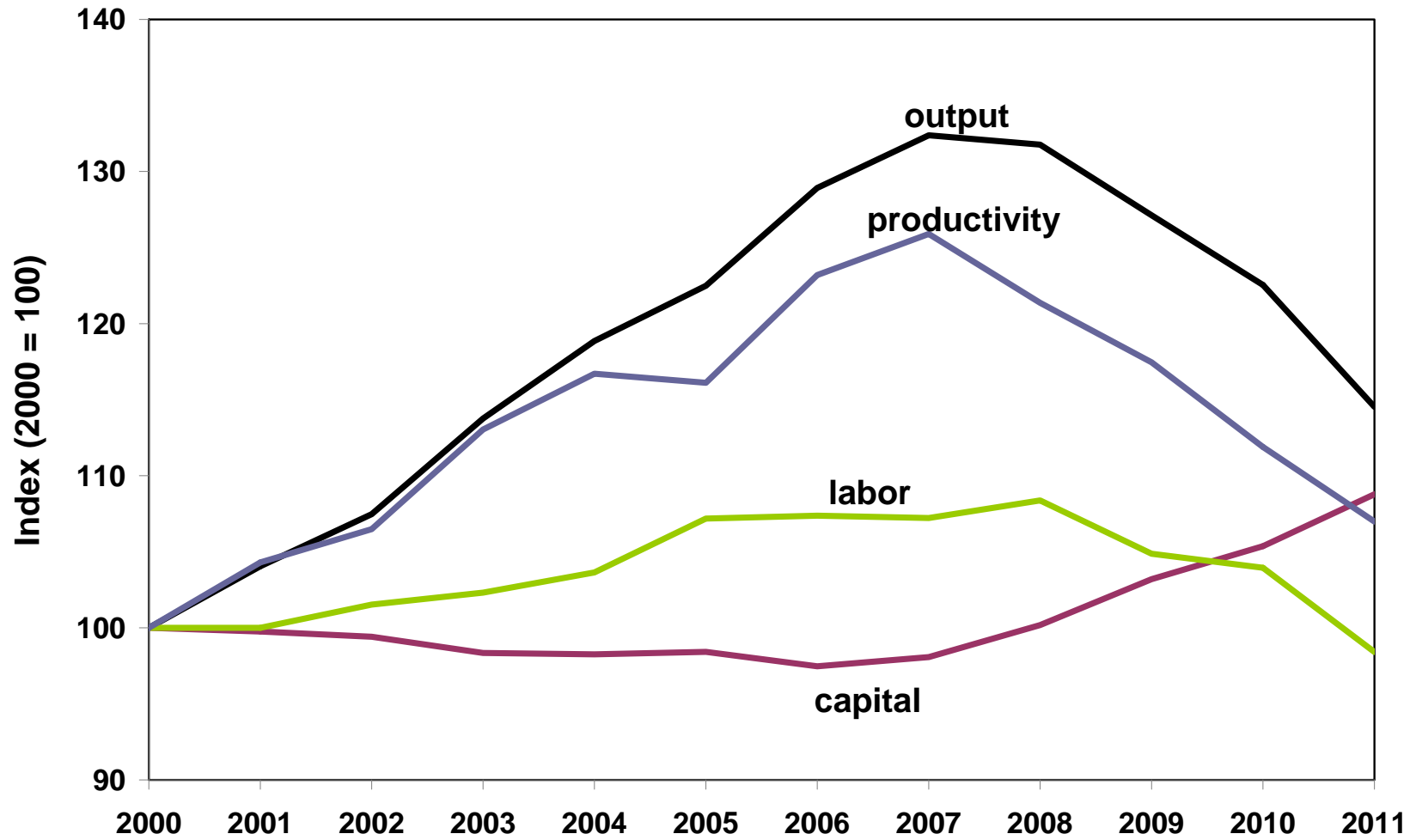


Greece is in a great depression. Great depressions threaten other European countries.

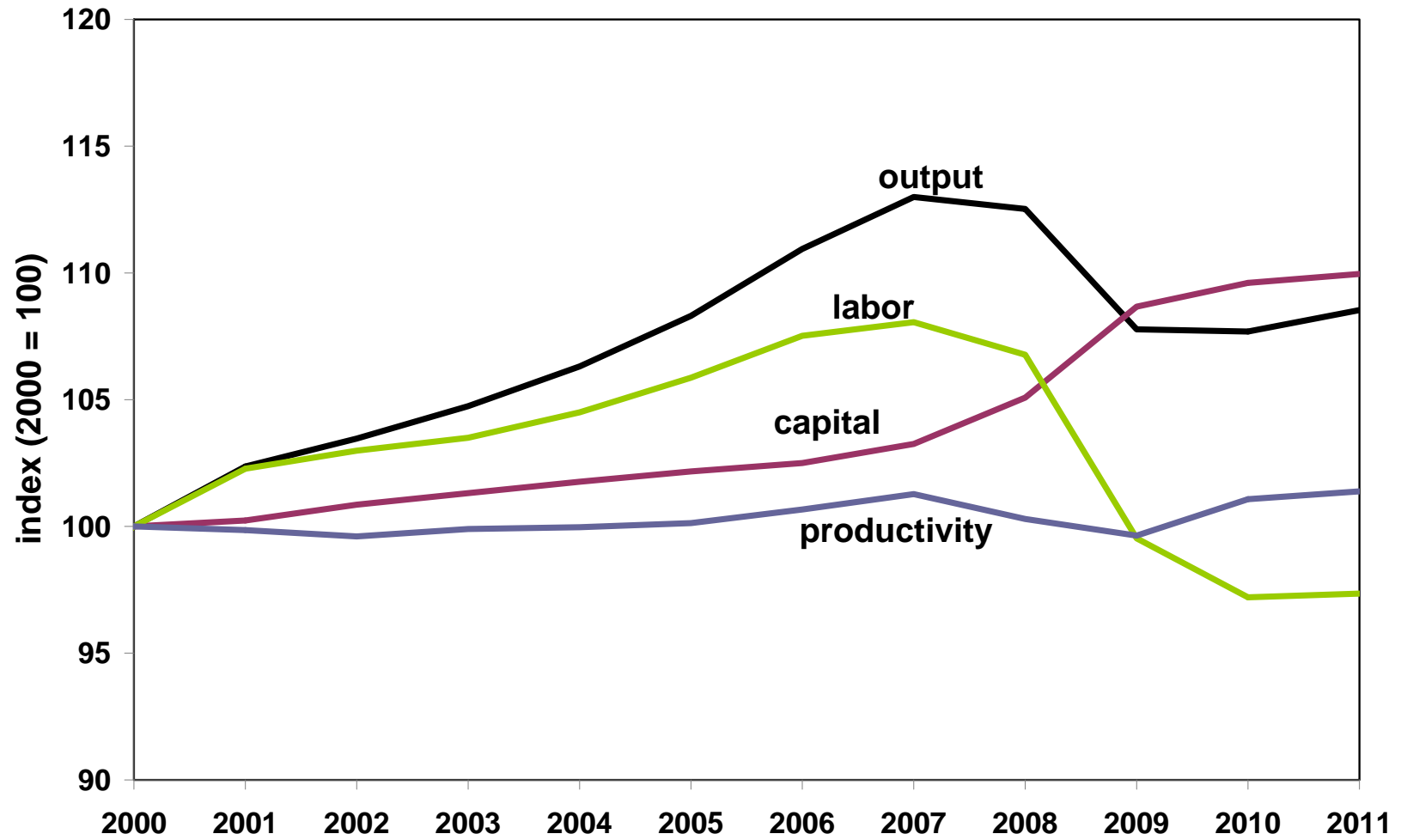
Growth accounting for Germany



Growth accounting for Greece



Growth accounting for Spain



Why is the debt crisis in Europe continuing?

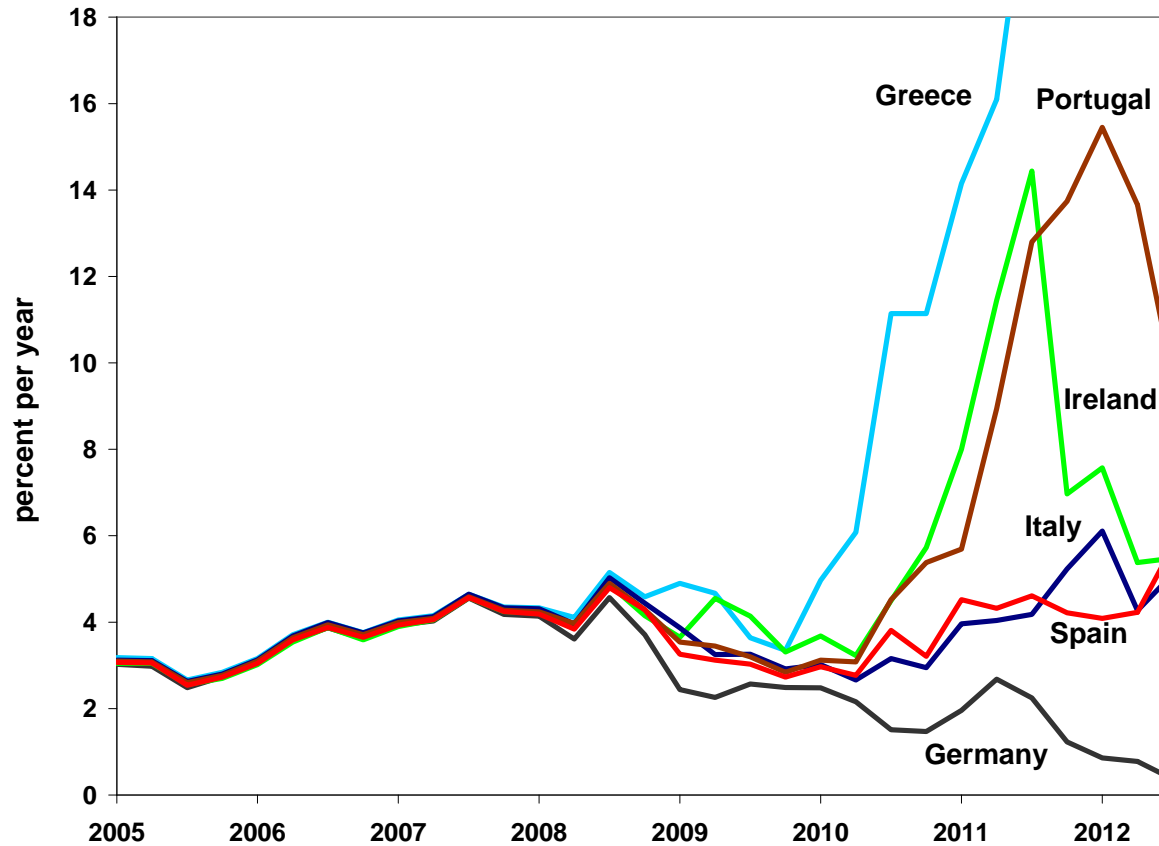
Why is the debt crisis in Europe continuing?

H. L. Cole and T. J. Kehoe (1996), “A Self-Fulfilling Model of Mexico’s 1994–95 Debt Crisis,” *Journal of International Economics*.

H. L. Cole and T. J. Kehoe (2000), “Self-Fulfilling Debt Crises,” *Review of Economic Studies*.

J. C. Conesa and T. J. Kehoe (2012), “Gambling for Redemption and Self-Fulfilling Debt Crises,” Federal Reserve Bank of Minneapolis.

Jumps in spreads on yields on bonds of PIIGS governments (over yields on German bonds)



Yields on 5-year government bonds

Theory of self-fulfilling debt crises (Cole-Kehoe)

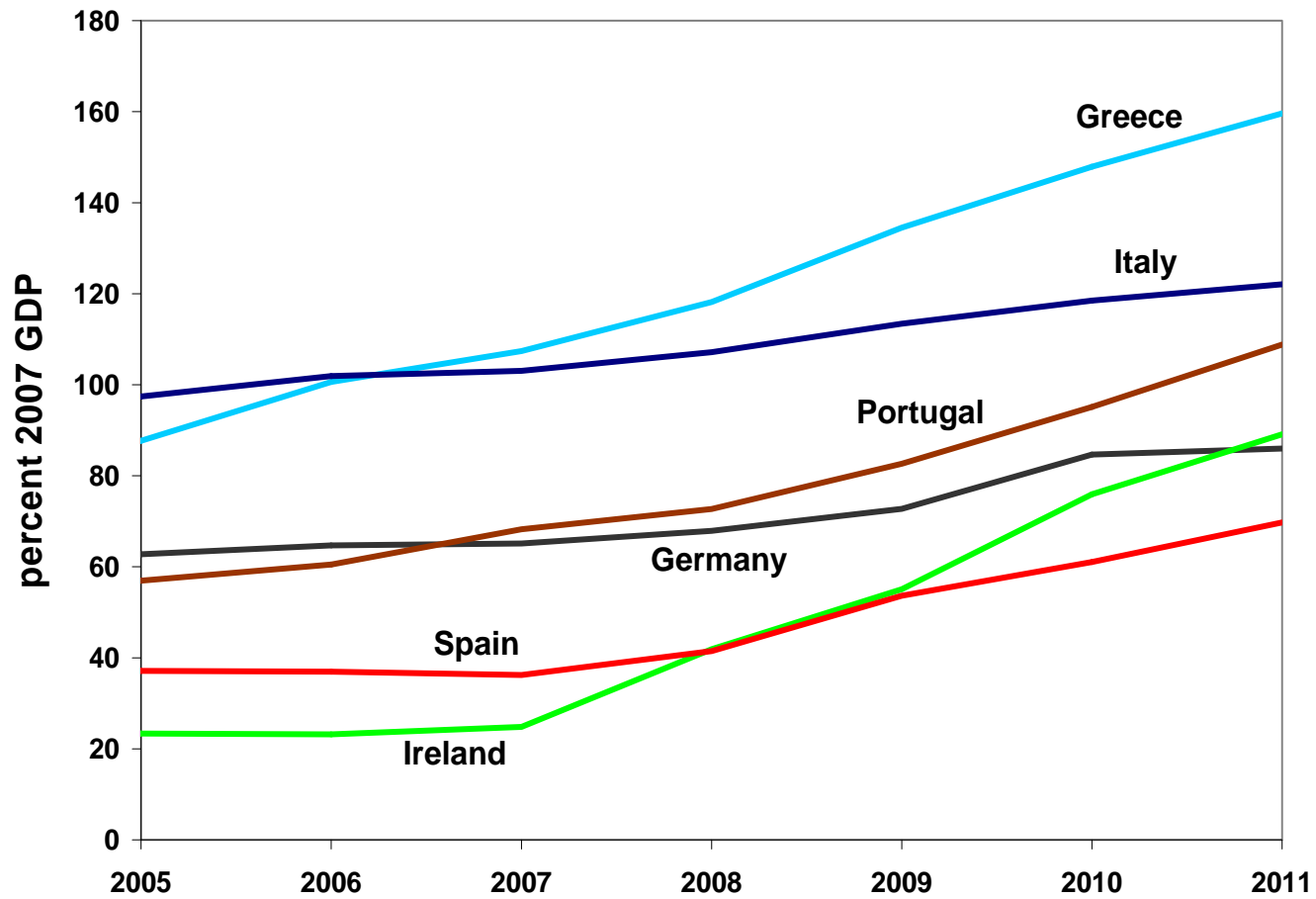
Spreads reflect probabilities of crises

For low enough levels of debt, no crisis is possible

For high enough levels of debt, default

For intermediate levels of debt (crisis zone) optimal policy is to run down debt

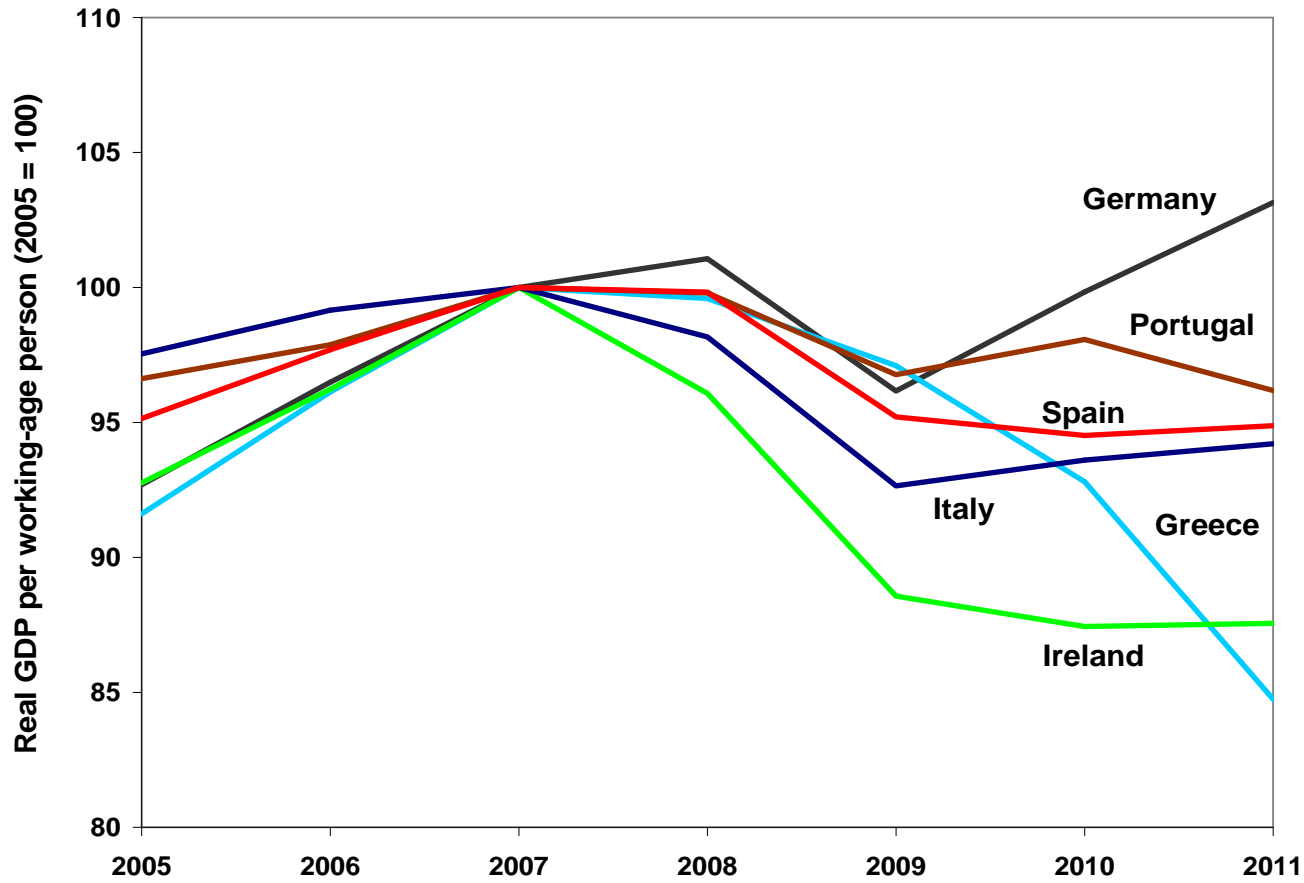
...but PIIGS ran up debt.



Government debt

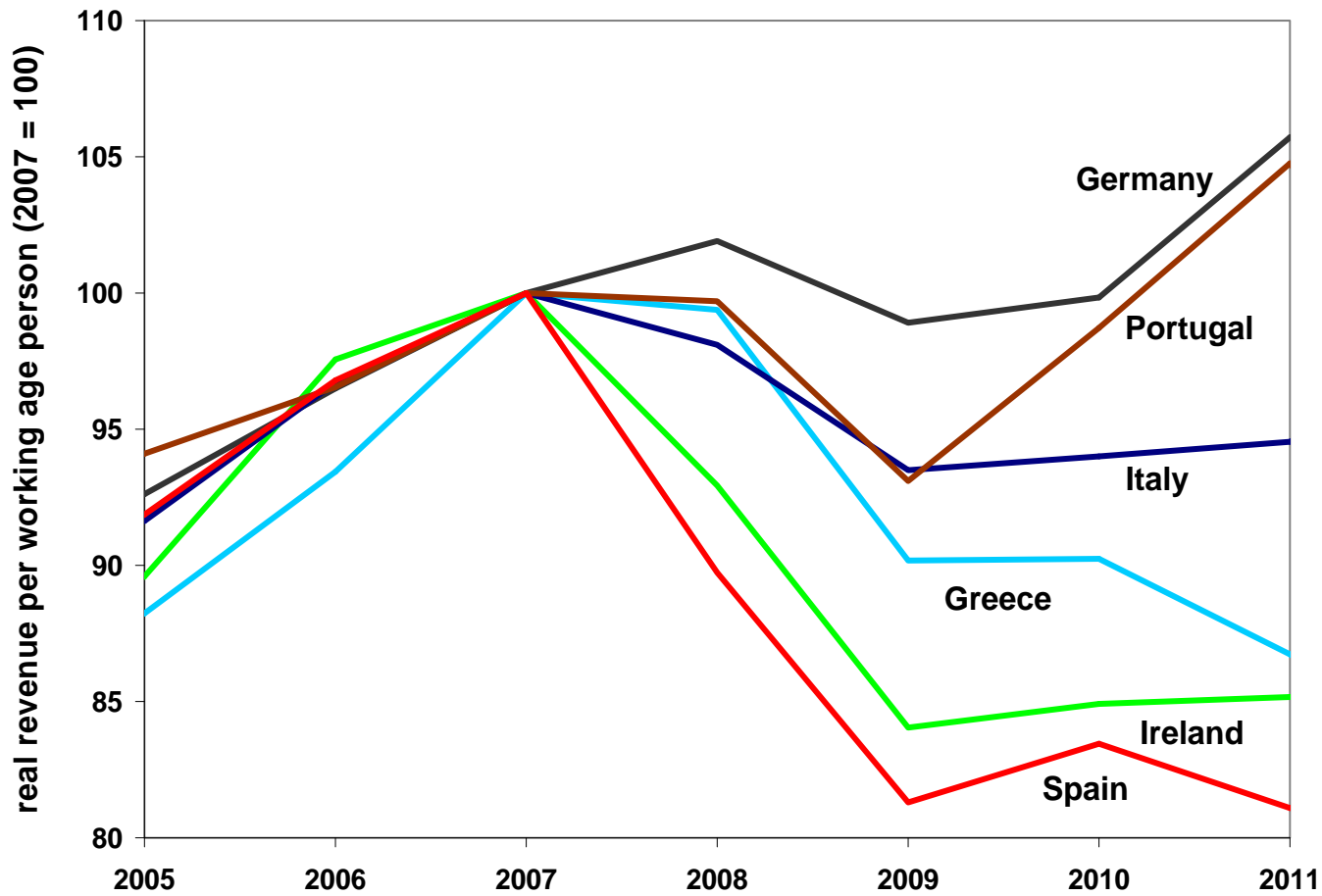
What is missing in Cole-Kehoe?

Severe recession in PIIGS, still ongoing



Real GDP

...government revenues also depressed.



Government revenues

Conesa-Kehoe (2012)

Extends Cole-Kehoe to stochastic output.

Standard consumption smoothing argument (as in Aiyagari, Chatterjee et al, Arellano) can imply running up debt.

When running up debt is optimal, we call it “gambling for redemption.”

Use model to evaluate impact of EU-IMF policy.

Contrast to Bill Clinton’s bailout of Mexico in 1995.

Main mechanism of Conesa-Kehoe

Model characterizes two forces in opposite directions:

1. Run down debt (as in Cole-Kehoe)
2. Run up debt (consumption smoothing)

Which one dominates depends on parameter values and EU-IMF policies.

Run down debt

In crisis zone run down debt if:

- Interest rates are high.
- Costs of default are high.

Run up debt

In recession run up debt if:

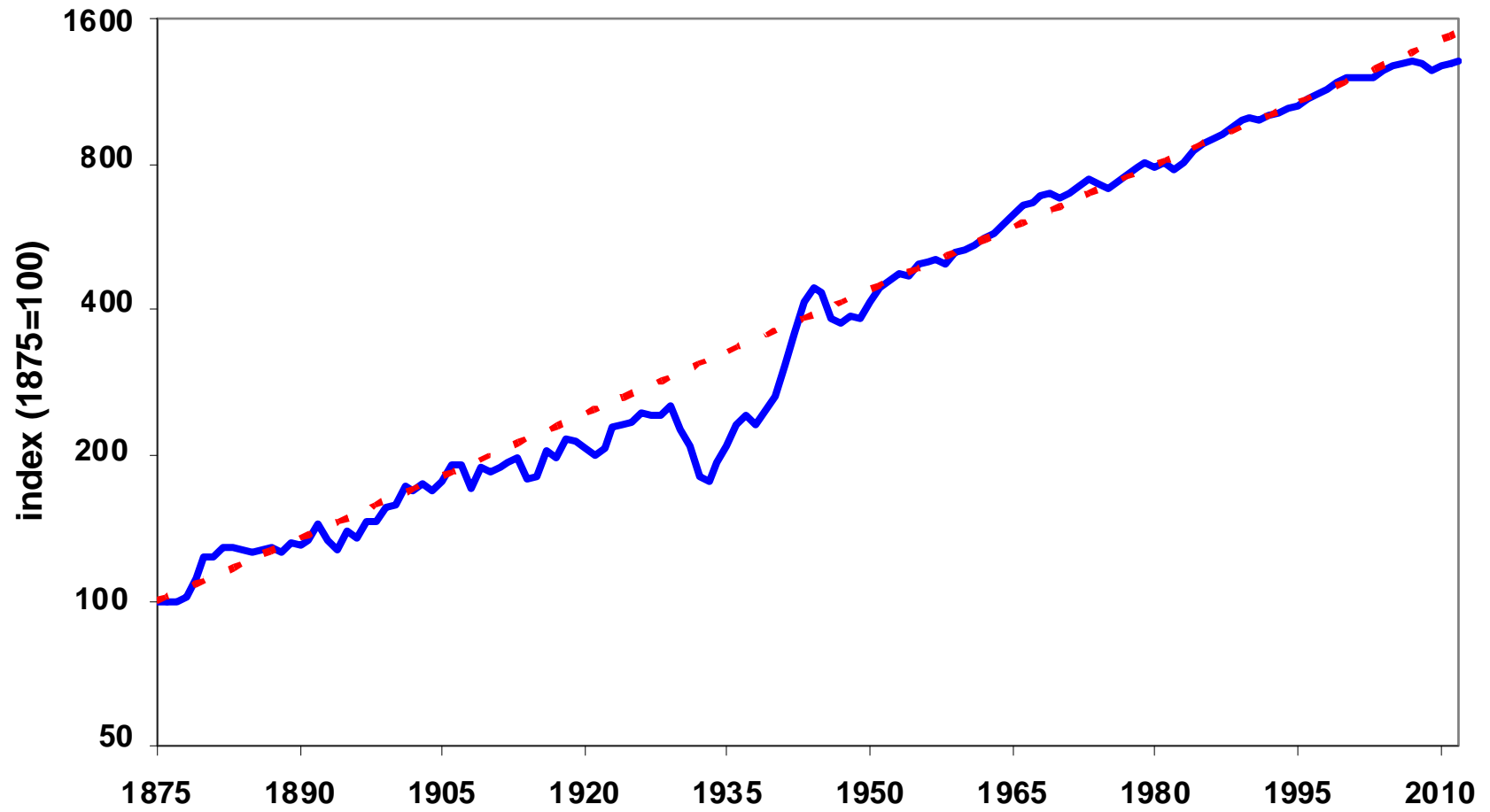
- Interest rates are low.
- Costs of default are low.
- Recession is severe.
- Probability of recovery is high.

Debt crisis in Europe will end when either

- Economic growth resumes.
- Countries realize that they are poorer than they thought they were in 2007.

How can we emerge from the debt crisis and restart growth?

Real GDP per working-age person in the United States



A digression on economic growth

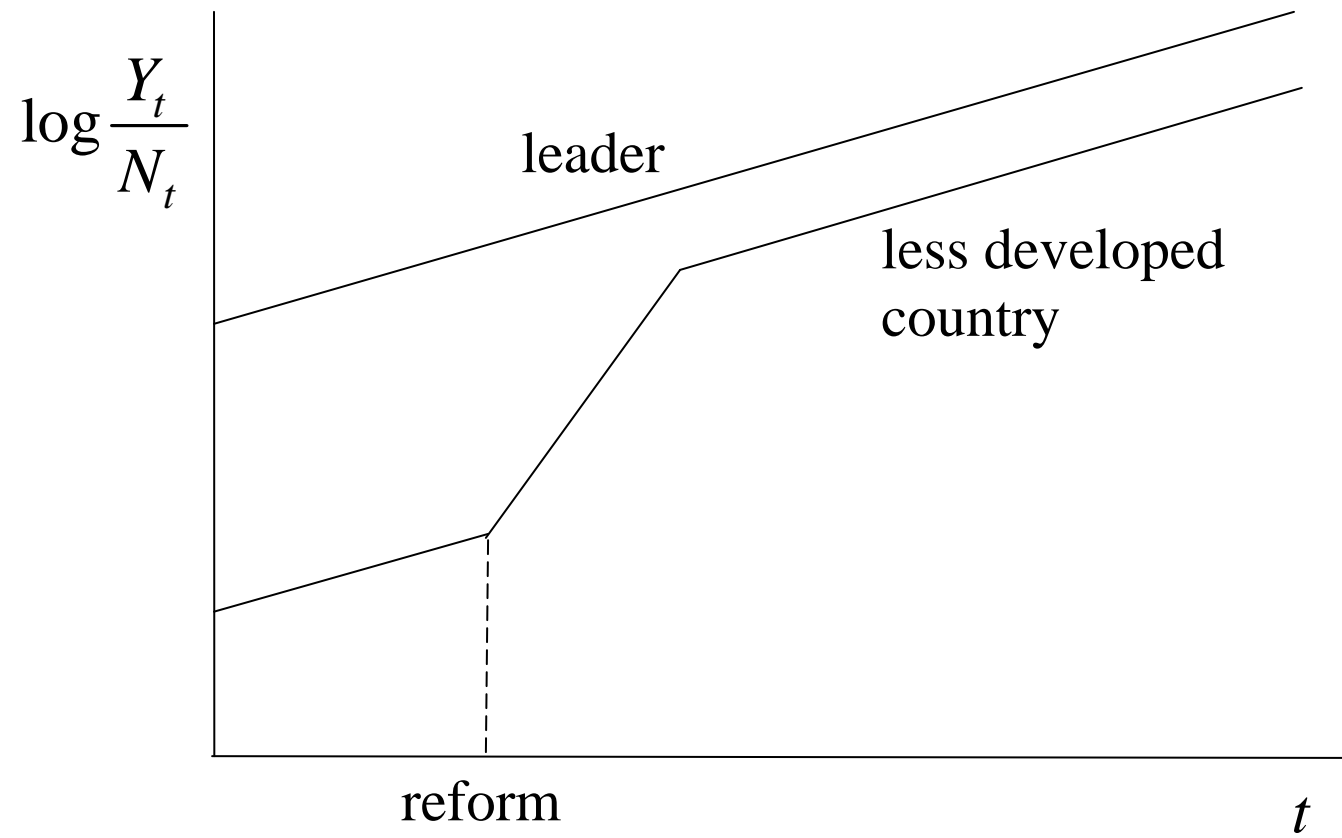
Real GDP per working-age person has grown by 2 percent per year in the United States since 1875.

This growth is a combination of technological progress and improvements in management.

Any country with stable institutions and policies should grow at roughly 2 percent per year.

A country that improves its institutions and policies should grow faster, until it reaches a new balanced growth path.

A country whose institutions deteriorate or whose policies worsen...



Sources of Growth

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha}$$

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

W. Lewis (2005), *The Power of Productivity: Wealth, Poverty, and the Threat to Global Stability*.

Best practice

Growth accounting shows us that we need to adopt policies to stimulate demand for labor, stimulate productivity growth.

Demand for labor

Adjustment after a debt crisis usually takes the form of devaluation.

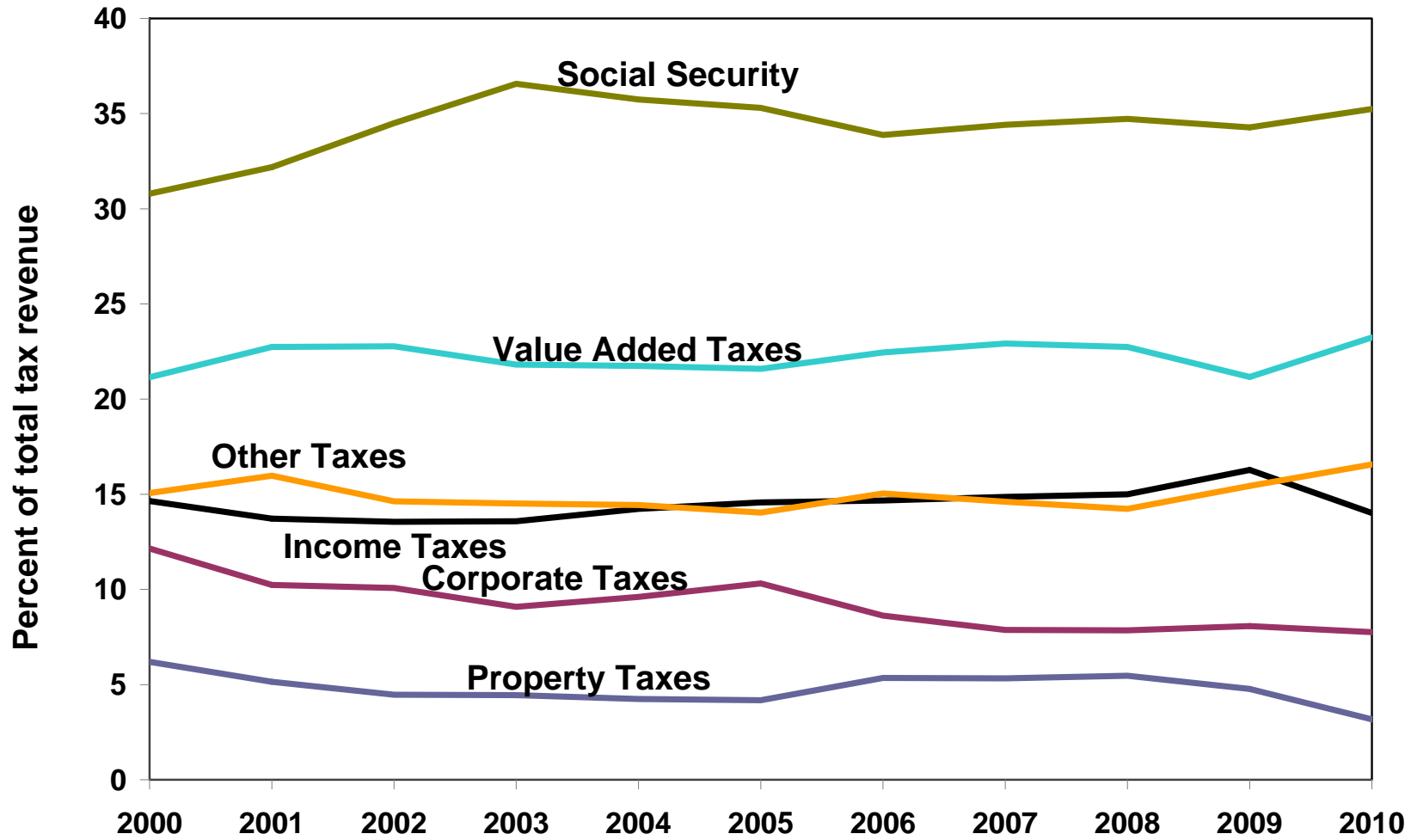
How can PIIGS devalue without leaving the Euro?

- Reduce social security taxes
- Increase VAT

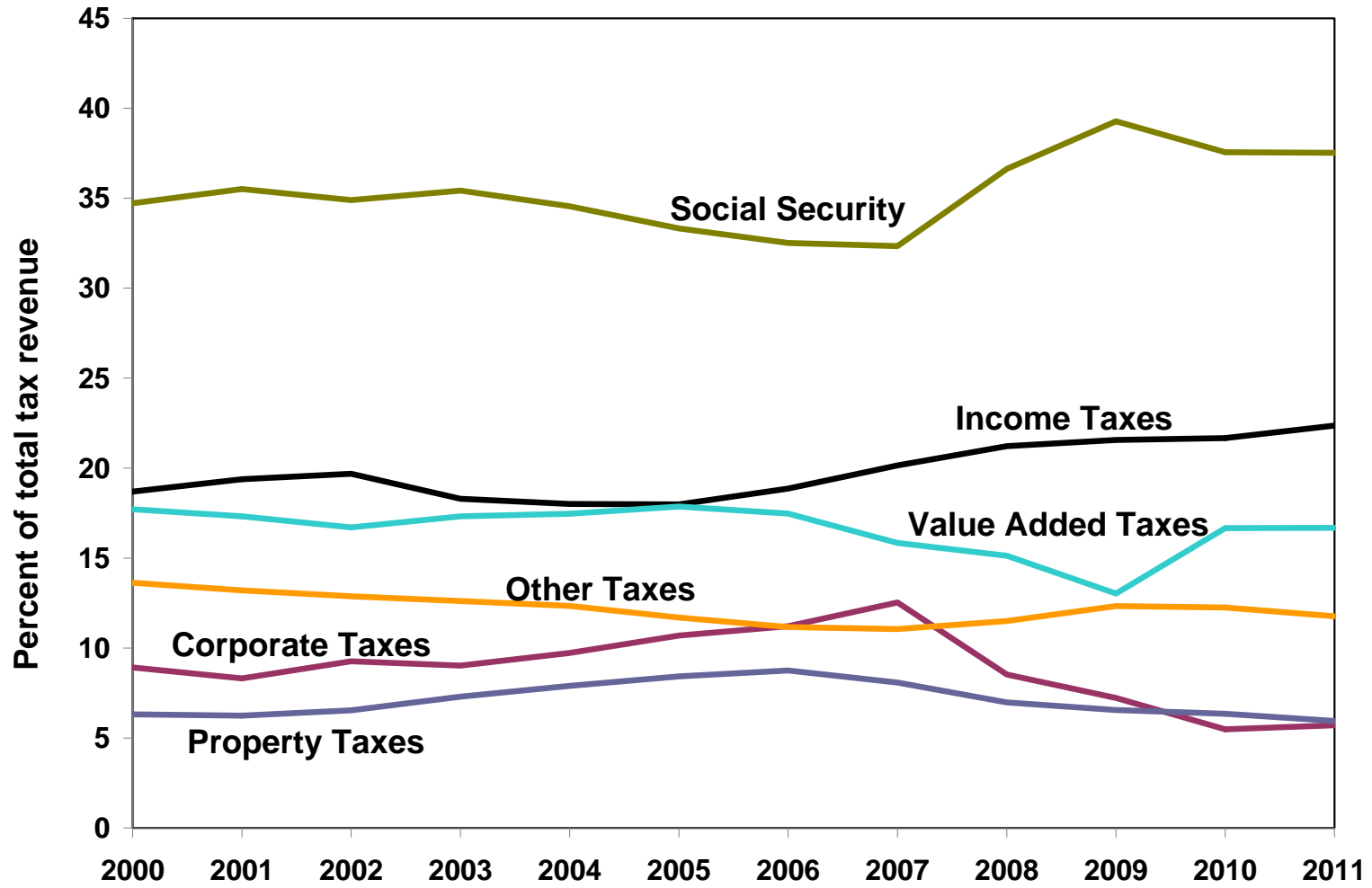
Lowers relative price of exports, lowers relative price of labor intensive goods.

T. J. Kehoe, A. Manresa, P. J. Noyola, C. Polo, and F. Sancho (1988), “A General Equilibrium Analysis of the 1986 Tax Reform in Spain,” *European Economic Review*.

Taxes in Greece



Taxes in Spain



Productivity growth

We need to pay the costs of cleaning up the financial system.

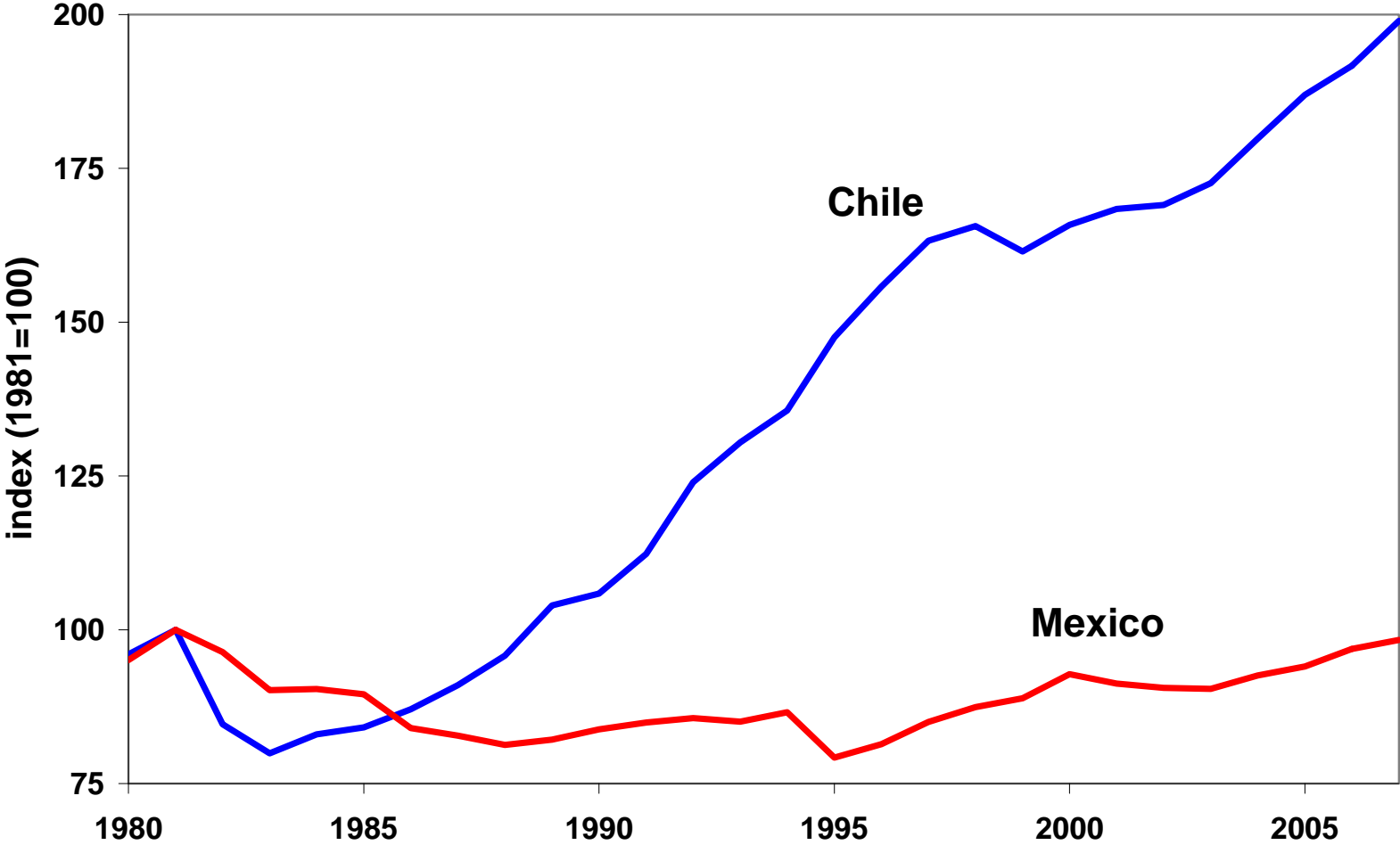
Compare the economic performances of countries that aggressively cleaned up their financial systems after a financial crisis with those that did not:

Chile versus Mexico

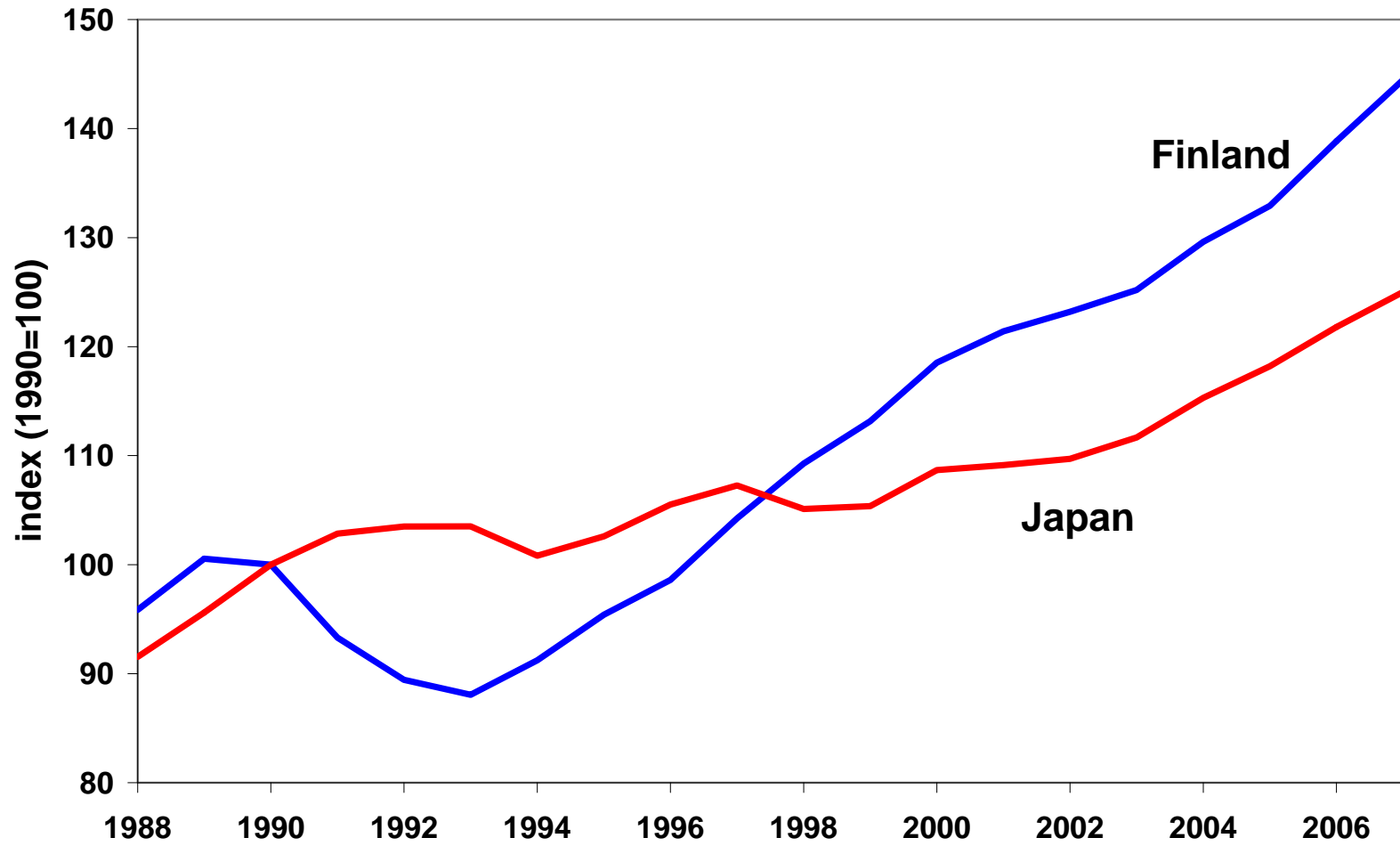
Finland versus Japan

Countries with similar levels of economic development that experienced severe financial crises at about the same time.

Real GDP per working-age person in Chile and Mexico



Real GDP per working-age person in Finland and Japan



Productivity growth

D. C. North, “Sources of Productivity Change in Ocean Shipping, 1600-1850,” *Journal of Political Economy*, 1968.

The conclusion that emerges from this study is that a decline in piracy and an improvement in economic organization account for most of the productivity change observed.

Productivity growth

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We have to identify and eliminate the pirates!



We have to identify and eliminate the pirates!

S. L. Parente and E. C. Prescott (1994), “Barriers to Technology Adoption and Development,” *Journal of Political Economy*.

T. J. Kehoe and K. J. Ruhl (2010), “Why Have Economic Reforms in Mexico Not Generated Growth?” *Journal of Economic Literature*.

High levels of productivity are the result of allocating resources — labor and capital — to efficient firms

Increases in productivity are the result of birth and growth of newer, more productive firms and death of older, less productive firms.

A useful data source for data on ease of allocating resources across firms and creating new firms: World Bank, *Doing Business 2013*

The Doing Business project provides objective measures of business regulations for local firms in 185 economies and selected cities at the subnational level.

Rankings in *Doing Business 2013*

Singapore	1
United States	4
Ireland	15
Canada	17
Germany	20
Portugal	30
Cyprus	36
Spain	44
Mexico	48
Kazakhstan	49
Italy	73
Greece	78
Zimbabwe	173
Central African Republic	185