Great Depressions and Fake Recoveries: Peru, 1980-2000

Sílvio Rendon Carlos Urrutia
ITAM

LAMES, Mexico, November 2006

.

Our research

- Peru 1980-2000
  - Populist experiment in the 1980s
  - Recovery
- Growth accounting and growth theory
- TFP!
- Concluding remarks

Populism

Revisit

Dornbusch-Edwards (1989) *Macroeconomics of Populism in Latin America*

Two populist experiments:

- Chile under Allende in 1970s
- Peru under Garcia in 1980s

Common features:

- from the initial conditions,
- motivation for policies,
- the argument that the country's conditions are different...
- to the ultimate collapse

Great Depressions

- Revisit relatively recent work by Bernanke (2004), Kehoe-Prescott (2002), Articles, RED 2002,5(1)
- Particularly relevant: Kehoe, Kehoe, Bergoeing, Soto (2002) (KKBS):
  - Usual stories:
    - monetarist
    - exchange rate,
    - debt overhang,
    - structural reforms
  - ...are not enough to account for observed differences between Chile (recovery) and Mexico (stagnation):
- Needed: a theory of TFP.

.

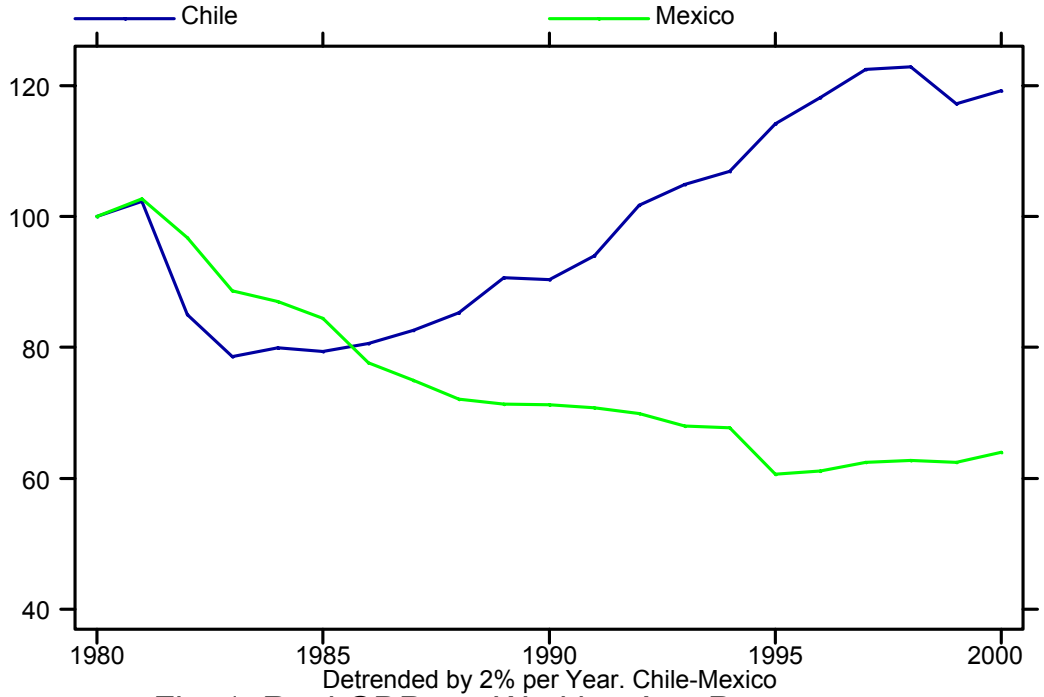


Fig. 1: Real GDP per Working Age Person

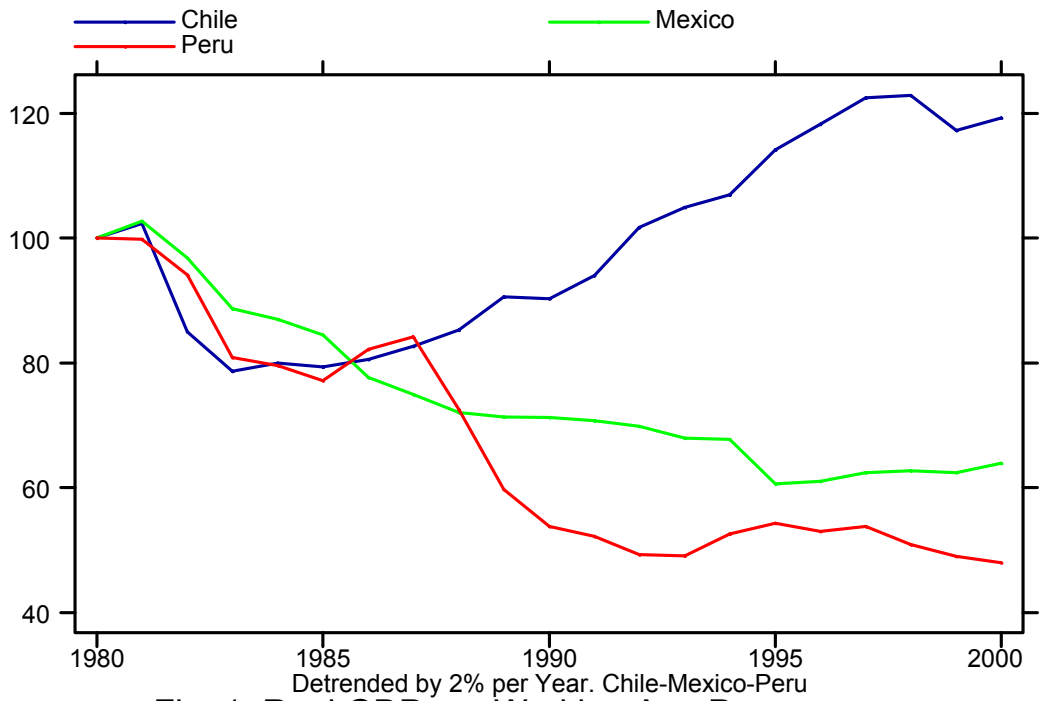
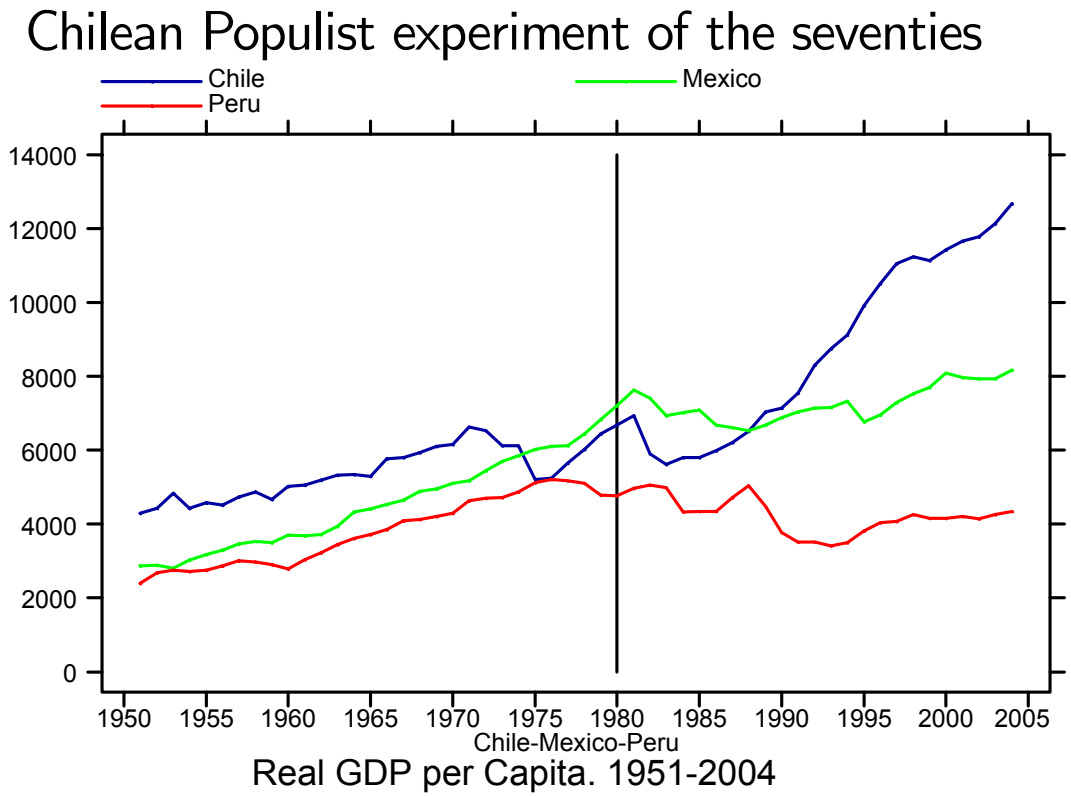
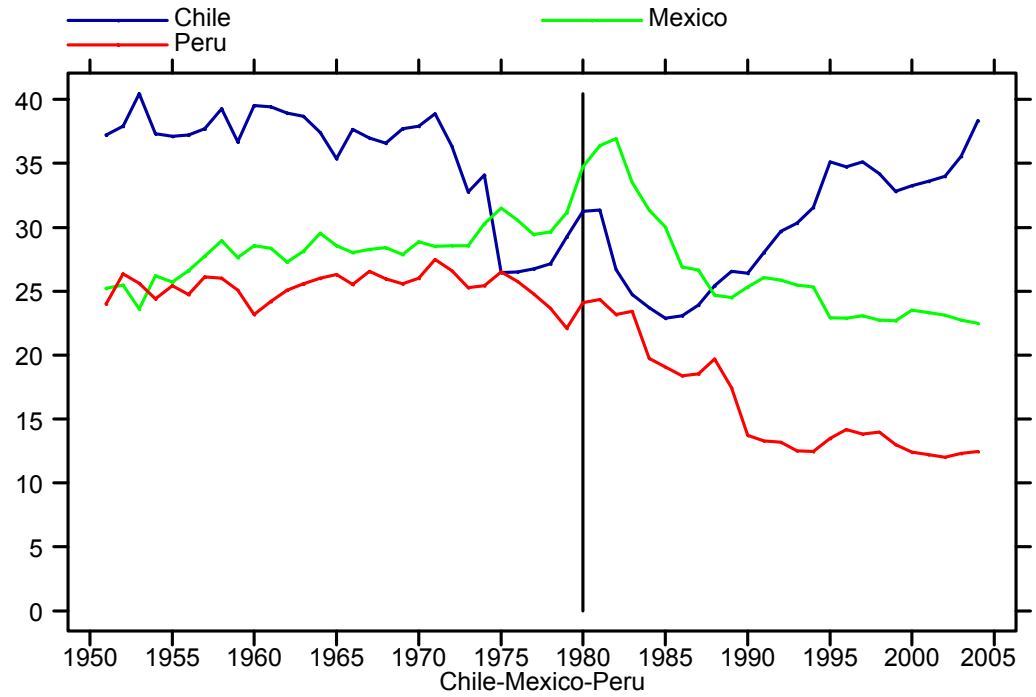


Fig. 1: Real GDP per Working Age Person

A longer perspective:



Fully recovered



Real GDP per Capita as % of the US. 1951-2004

Fully recovered?

.

1. Recovering from populism itself.
2. Huge gap.
    - Some Peruvian politicians seem not worried about this widening gap

But about another gap:


N
PERÚ
Camaná
Océano Pacífico
Tacna
Planteamiento chileno
Arica
Planteamiento peruano
CHILE
Iquique
EL COMERCIO

.

Lucas yesterday:

- More (less) land, does not make you richer (poorer).

It's human creativity, stupid!

-

.

Anyhow...

Thankfully Peru is currently not going the Chávez's-way...

.

.

just the Garcia's-way.... : (

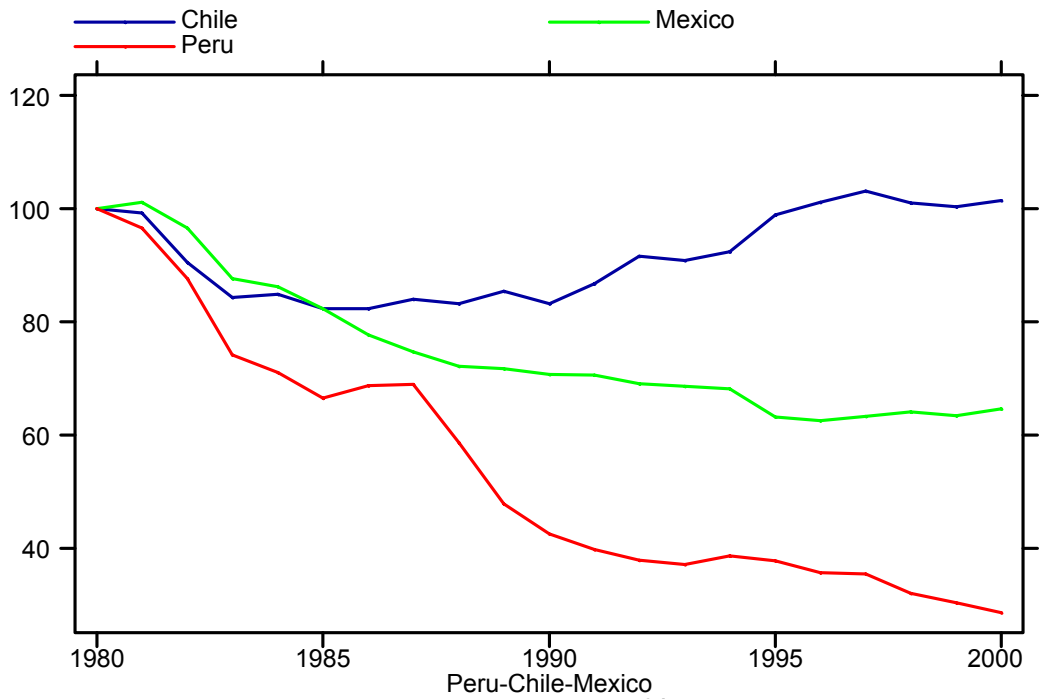


Fig. 2: TFP Detrended by 1.4% Annual

.

Again: these countries faced similar crises:

.

- large foreign debt
- appreciating real exchange rate
- large trade deficit
- banking problems

and similar shocks:

- jump in world interest rate
- plummet in copper and oil prices
- cutoff in foreign lending

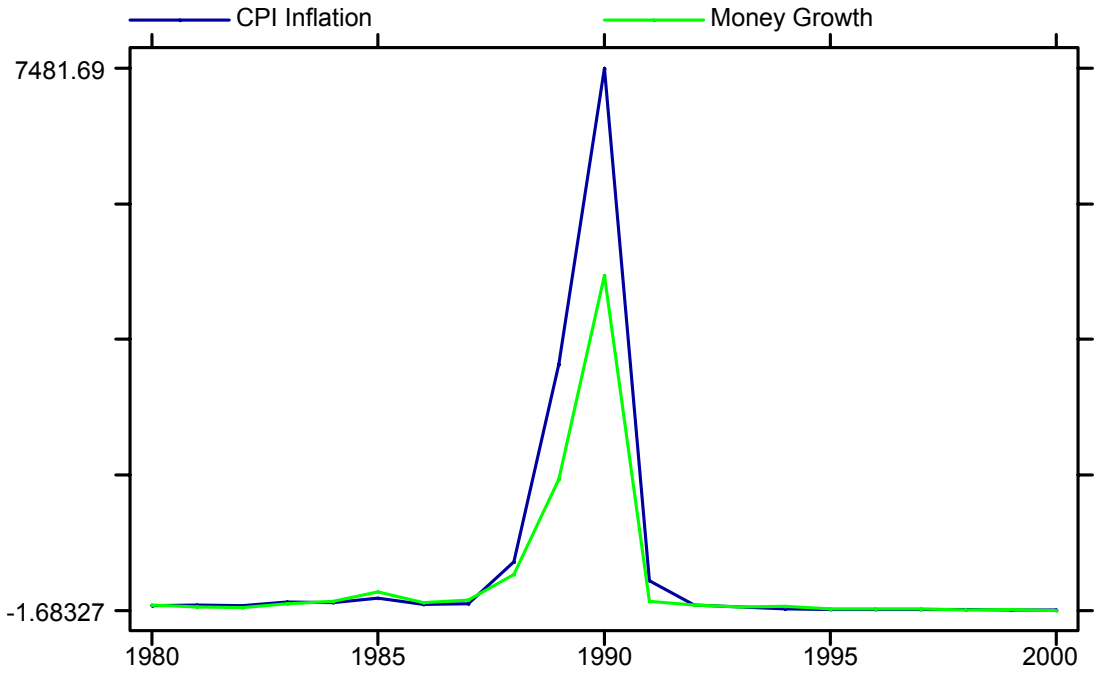
.

KKBS's Stories for different recoveries checklist:

1. Different money growth rates induced different real responses. No.
2. Real exchange rate depreciation + decline in wages generate export-led growth in Chile, but not in Mexico.
3. Large debt overhang deterred investment in Mexico, but not in Chile
4. Structural reforms that took place in Chile in the 1970s took place in Mexico in the 1980s or 1990s.

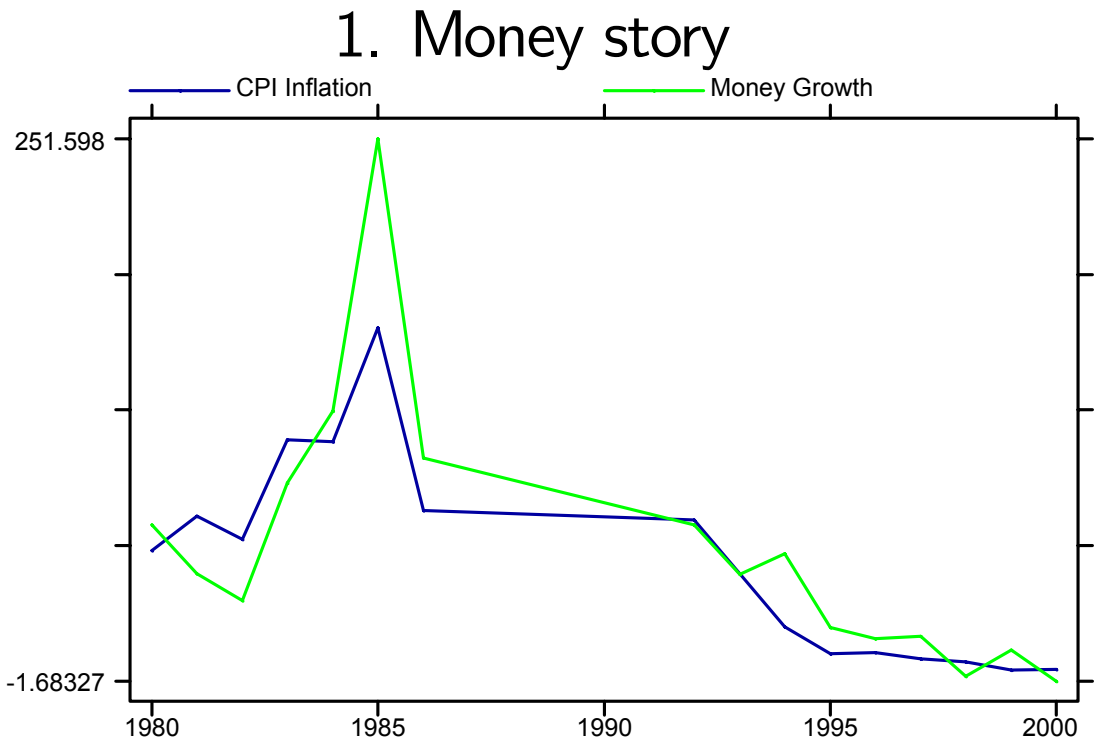
.

1. Money story



Peru: Money growth and CPI inflation

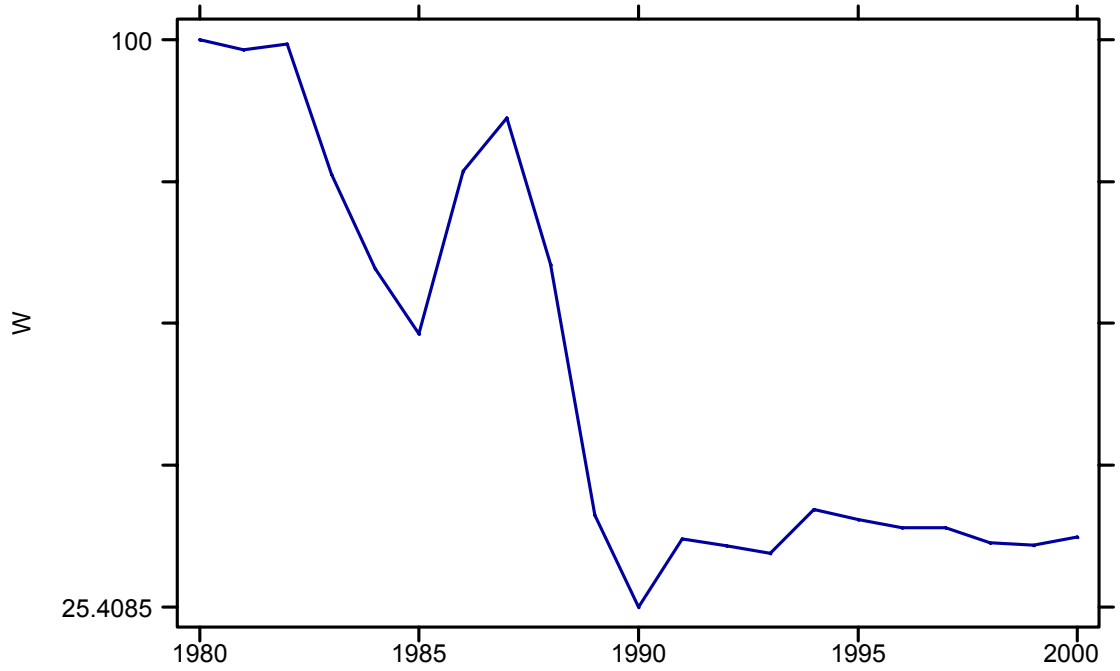
.



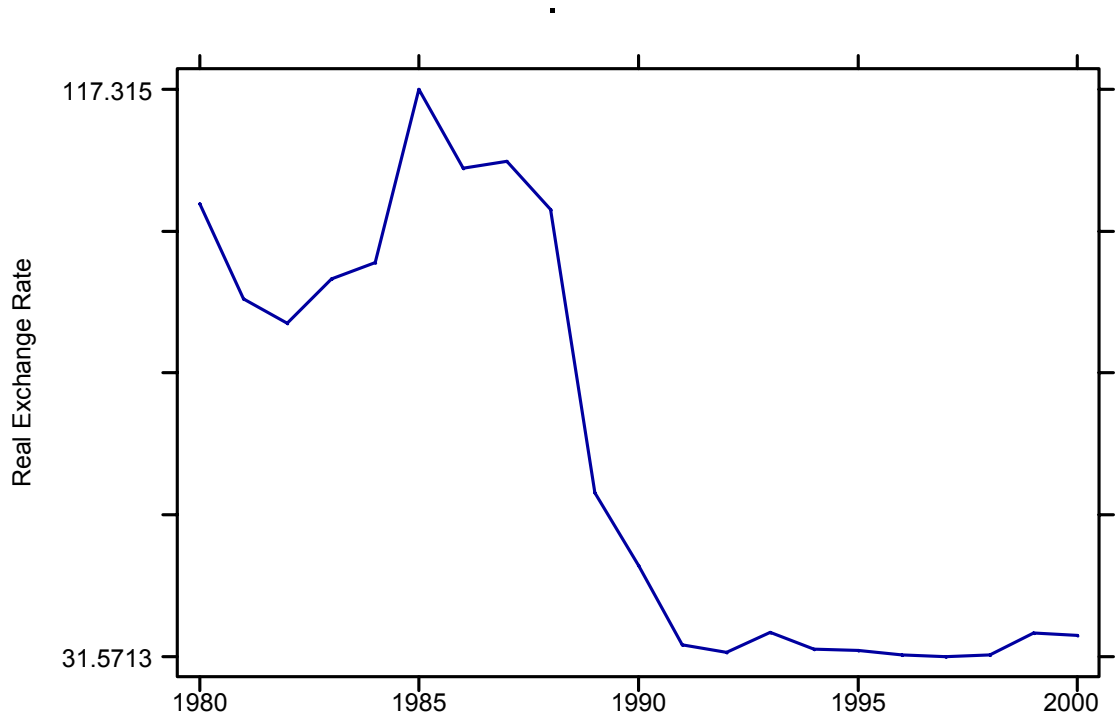
Peru: Money growth and CPI inflation (excluding 1987-1991)

.

2. Exchange rate-real wage story

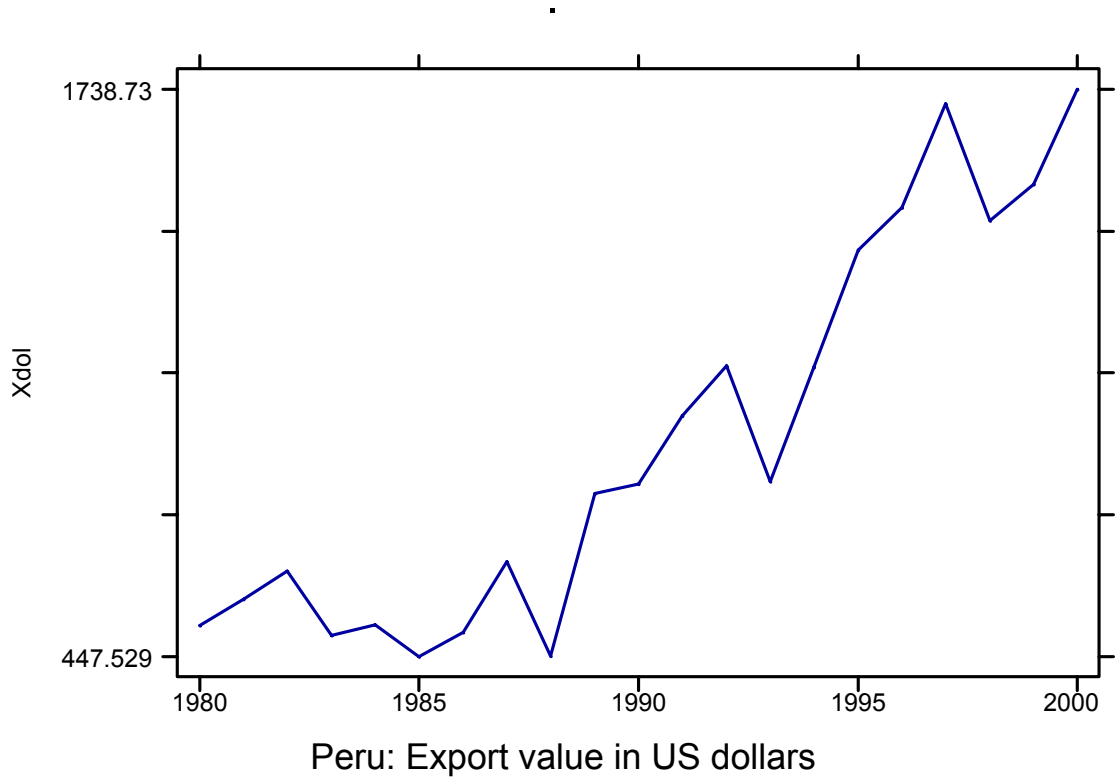


Peru: Index of Real Wages in Manufacturing

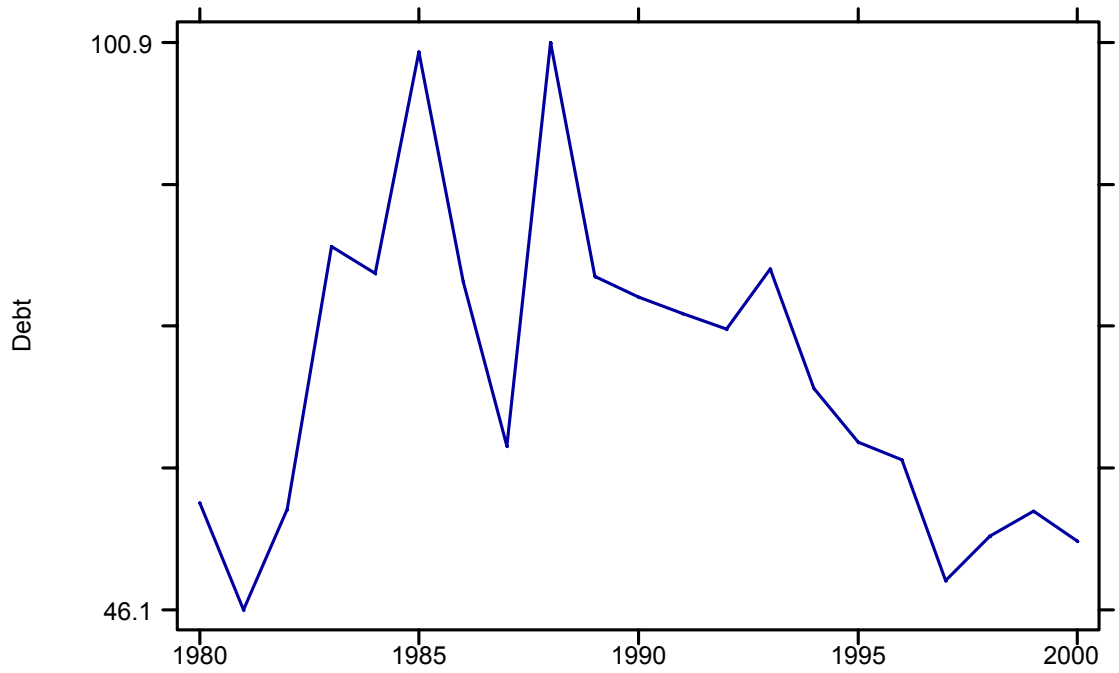


Peru: Real Exchange Rates against the US dollar

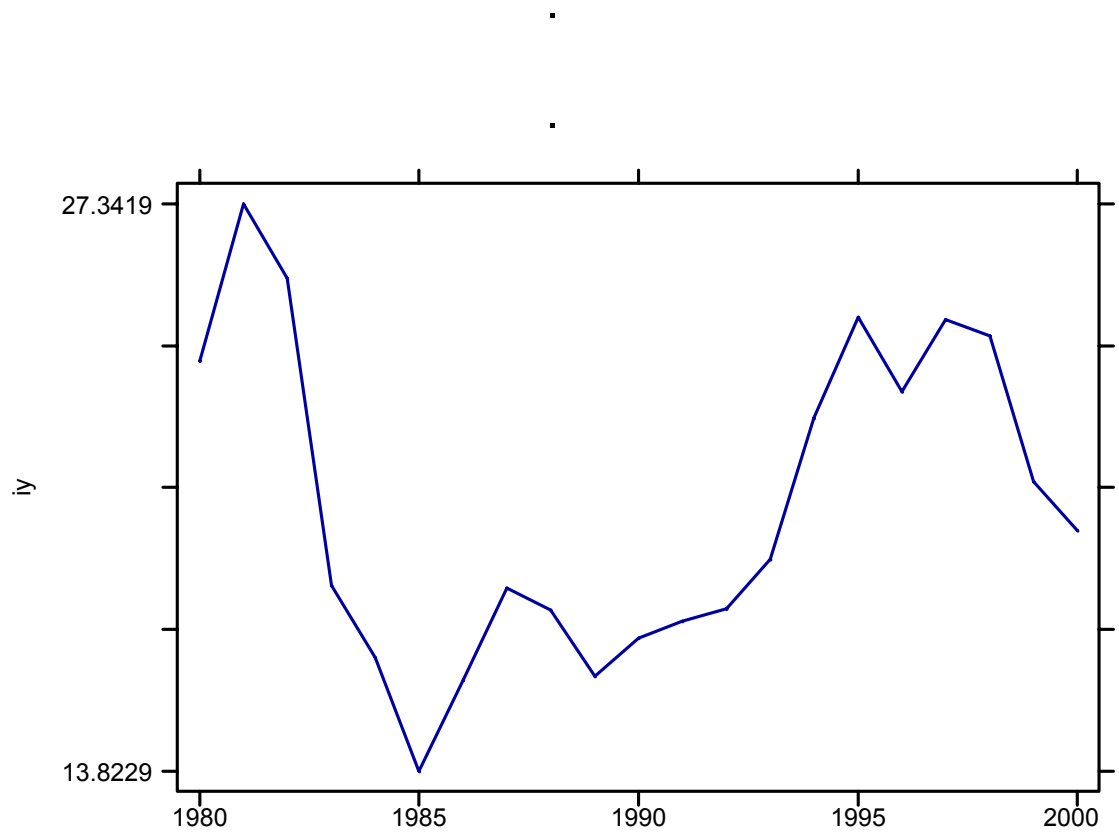
Peru: International Trade as a percent of GDP


1738.73
447.529
Xdol
1980
1985
1990
1995
2000
Peru: Export value in US dollars

3. Debt overhang story



Peru: Total External Debt as a percent of GDP



Peru: Investment as a percent of GDP

.

4. Structural reforms story

The issue

- Did reforms affect factor inputs or productivity?
- What was timing of reforms?

.

4. Structural reforms story

Peru: early nineties: aggressive program of reforms

- Tax reform
- Social security reform
- Labor Market reform
- Trade reform
- privatizations
- Fiscal deficits: unlike Chile / like Mexico.

These reforms also happened in Chile and Mexico, earlier. Why did Peru not fully recover?.

.

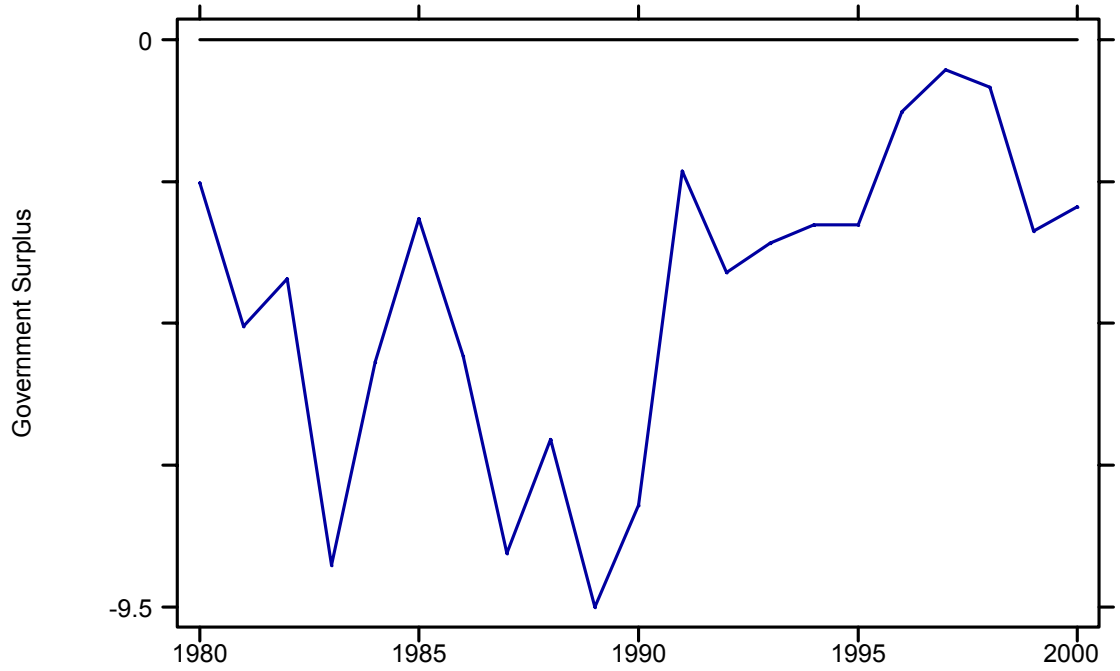
4. Structural reforms story

Reforms are certainly important, but

1. not for explaining the differences
2. timing seems wrong. Chile 70s, Mexico 80s, Peru 90s.

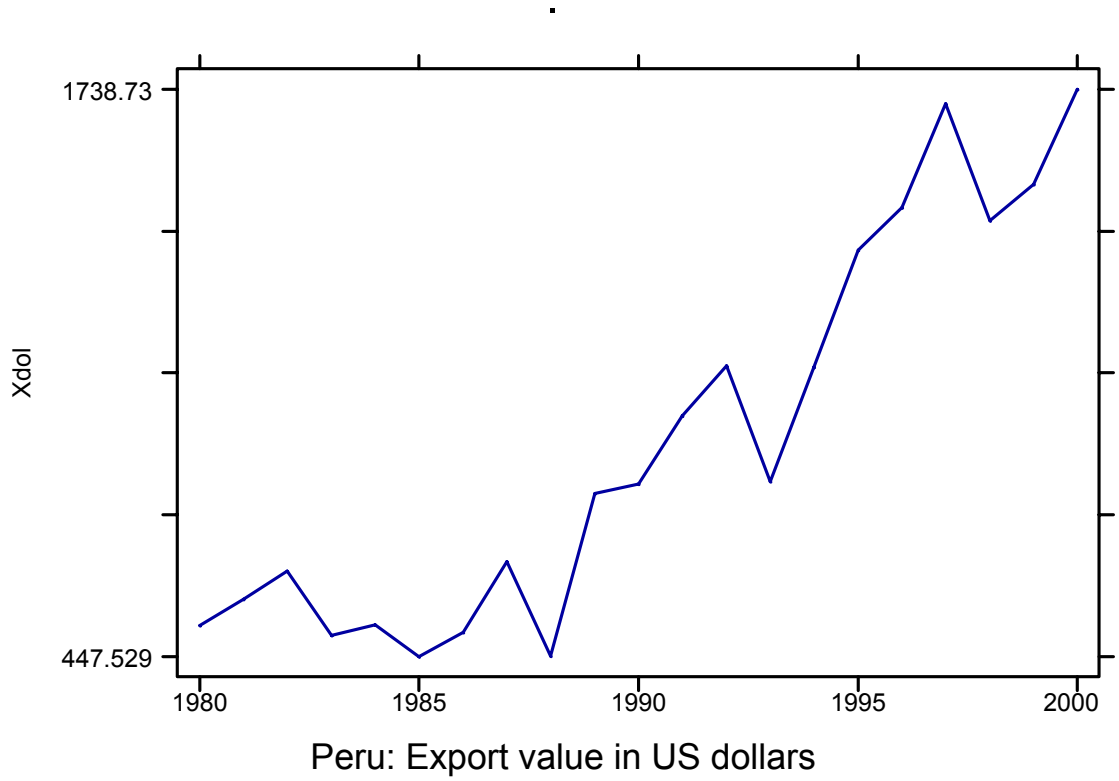
.

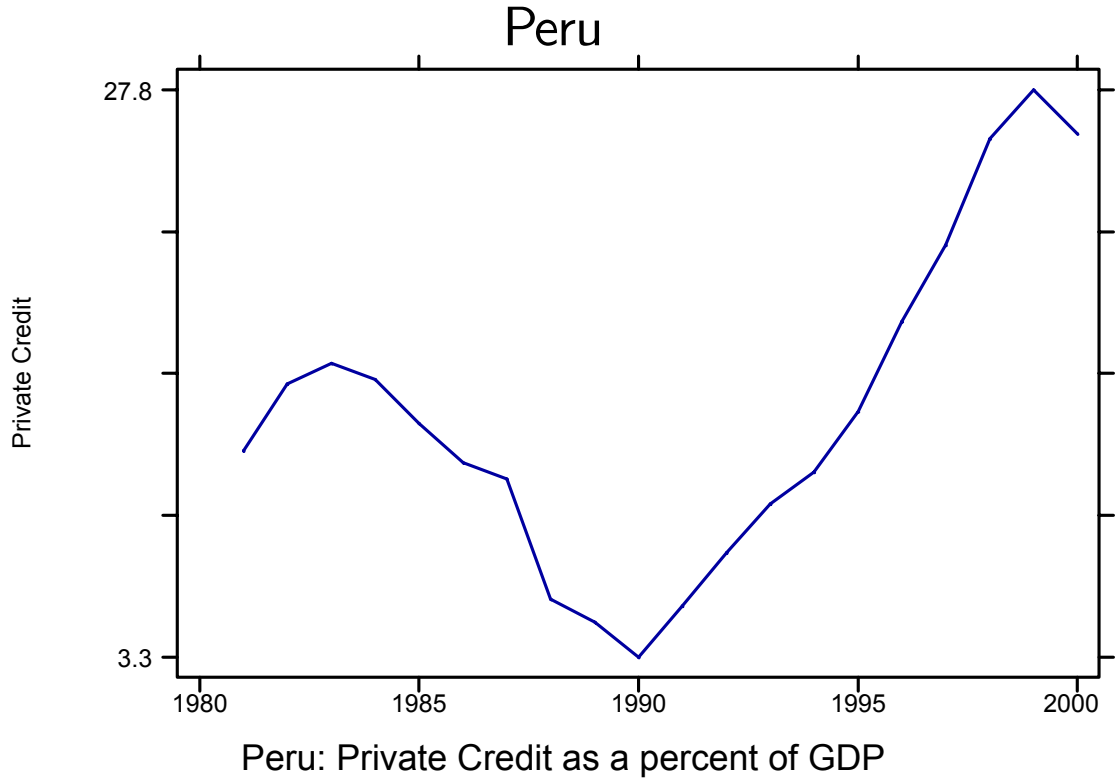
4. Structural reforms story



Peru: Government Surplus as a percent of GDP

Peru: International Trade as a percent of GDP


1738.73
447.529
Xdol
1980
1985
1990
1995
2000
Peru: Export value in US dollars



Unlike Chile and like Mexico supporting inefficient firms??

.

Growth Accounting

Production function.

$$Y = AK^{\alpha}L^{1-\alpha}$$

Capital accumulation

$$K_{t+1} = (1-\delta)\,K_t + I_t$$

$\alpha = 0.3, \delta = 0.05$

Decomposition of changes in output

$$\ln Y_t = \ln A_t + \alpha \ln K_t + (1-\alpha) \ln L_t$$

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

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

$$\frac{\ln\left(\frac{Y_{t+s}}{N_{t+s}}\right) - \ln\left(\frac{Y_t}{N_t}\right)}{s} = \frac{1}{1-\alpha}\frac{\ln A_{t+s} - A_t}{s} + \frac{\alpha}{1-\alpha}\frac{\ln\left(\frac{K_{t+s}}{Y_{t+s}}\right) - \ln\left(\frac{K_t}{Y_t}\right)}{s} + \frac{\ln\left(\frac{L_{t+s}}{N_{t+s}}\right) - \ln\left(\frac{L_t}{N_t}\right)}{s}$$

.

Applied dynamic general equilibrium model

The representative consumer solves

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

subject to

$$C_t + K_{t+1} - K_t = w_t L_t + (1-\tau_t)\left(r_t - \delta\right) K_t + T_t$$

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

Feasibility

$$C_t + K_{t+1} - (1-\delta) K_t = Y = A K^{\alpha} L^{1-\alpha}$$

.

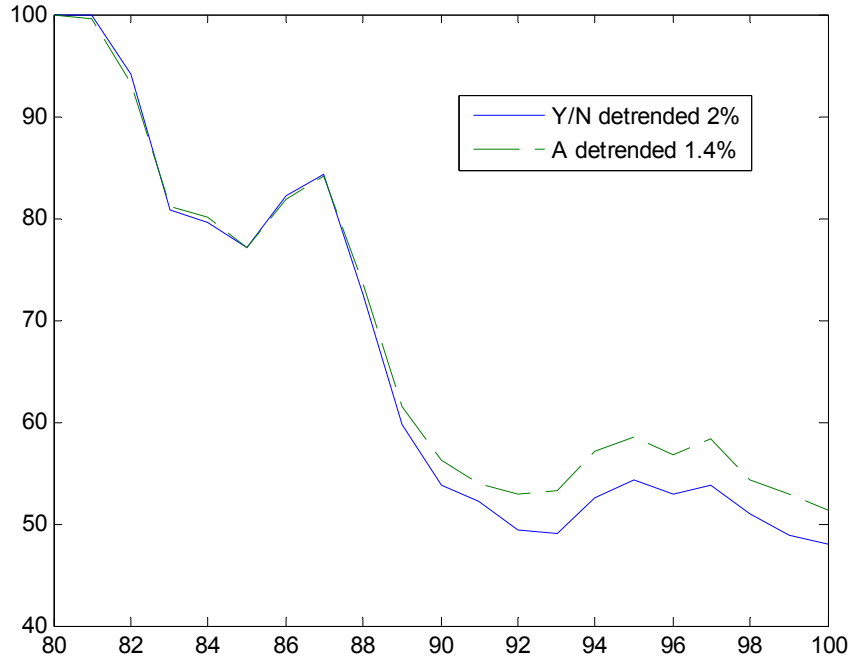
Calibration

First order conditions:

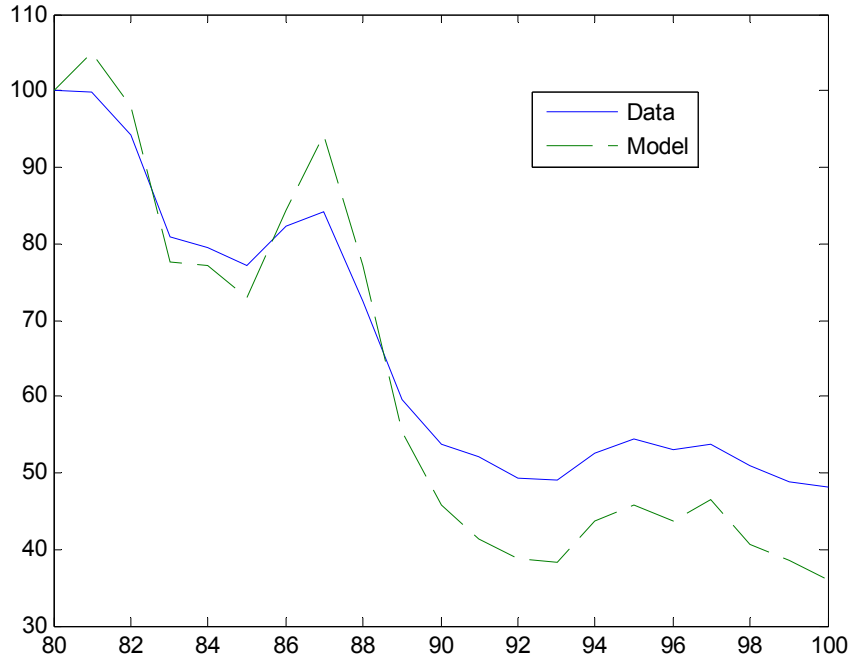
$$\frac{1}{C_{t-1}} = \frac{\beta}{C_t}\left[1-(1-\tau_t)\left(r_t-\delta\right)\right]$$
$$\frac{1-\gamma}{\overline{h}N_t - L_t} = \frac{\gamma w_t}{C_t}$$

Take parameters form KKBS:

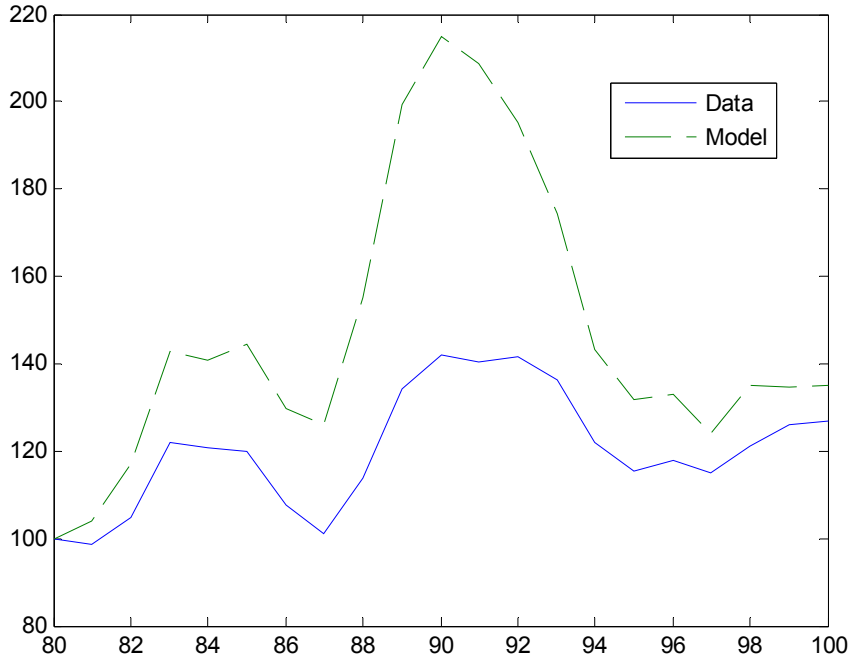
- α=0.3; Capital share in output
- $\beta = 0.98$; Discount rate
- δ=0.05; Depreciation rate
- γ=0.3; CRRA parameter
- τ=0.5; capital tax



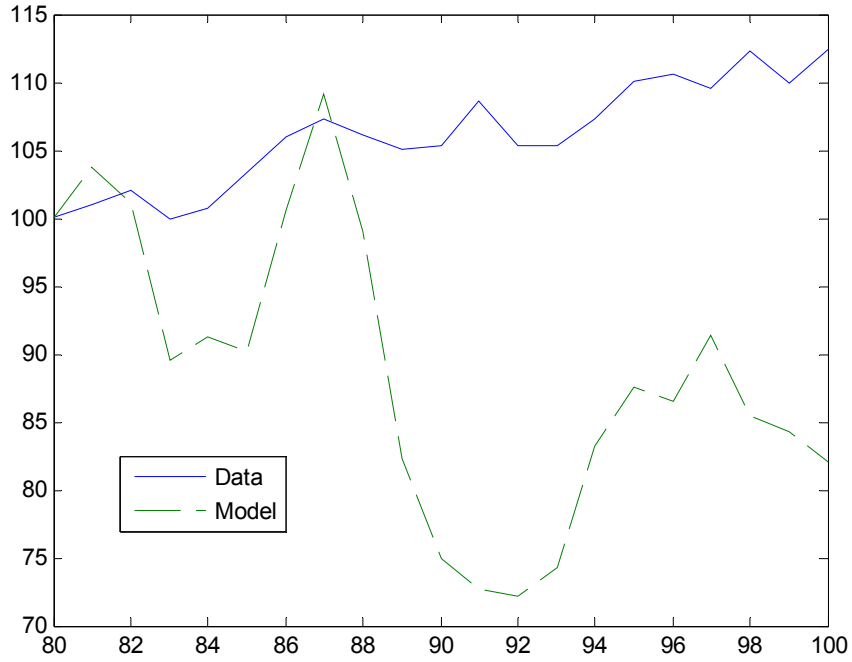
GDP per worker and TFP in the Data



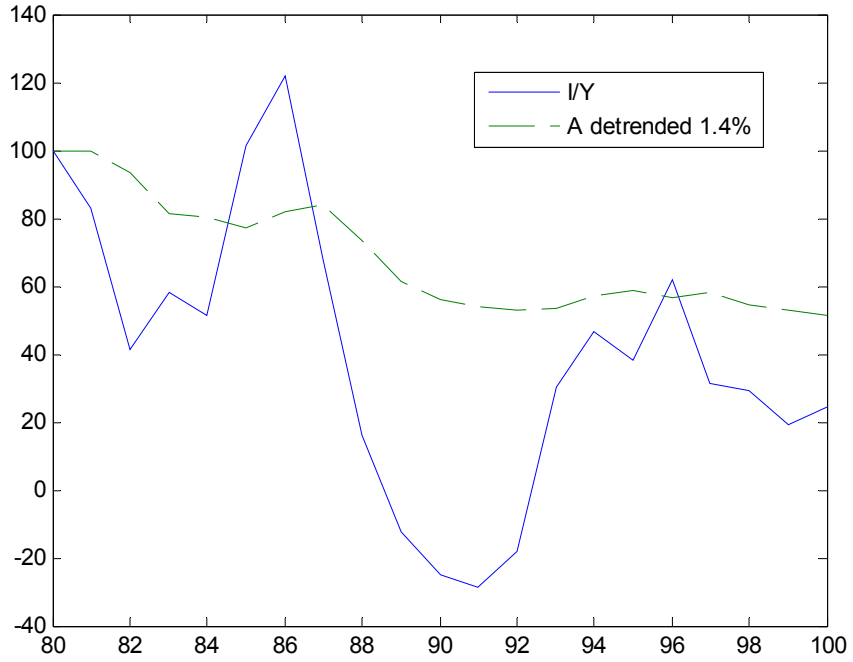
GDP per worker (Y/N)



Capital to Output Ratio (K/Y)



Labor Supply per Worker (L/N)



Investment to Output Ratio and TFP in the Model

.

PERU: GROWTH ACCOUNTING

Change %

Periods	**Crisis 80-85**		**Fake recov 85-87**		**Disaster 87-92**		**Recovery 92-00**	
	Data	Model	Data	Model	Data	Model	Data	Model
Change in log real output per worker	-1.39	-1.88	2.77	6.41	-3.79	-6.85	0.82	0.52
- due to TFP (A)	-2.36	-2.36	3.57	3.57	-4.89	-4.89	0.70	0.70
- due to K/Y	0.68	1.37	-1.62	-1.29	1.26	1.63	-0.29	-0.98
- due to L/N	0.28	-0.89	0.81	4.12	-0.16	-3.59	0.41	0.79

.

Preliminary Remarks

Importance of explaining differences in total factor productivity more than changes that affect differences in factor inputs.

Different paths of total factor productivity do account for differences in output per worker and partially for the capital-output ratio, but clearly not for employment.

Check with more attention:

- Tax reforms
- Labor market reforms
- Creative destruction? Destructive creations?