# Peru's Great Depression: A Perfect Storm?

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## Introduction

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- The recovery from Peru's collapse took **15 years**, clearly not V-shaped

# While Latam lost one decade, Peru lost three decades



Real GDP per capita, 1960=100
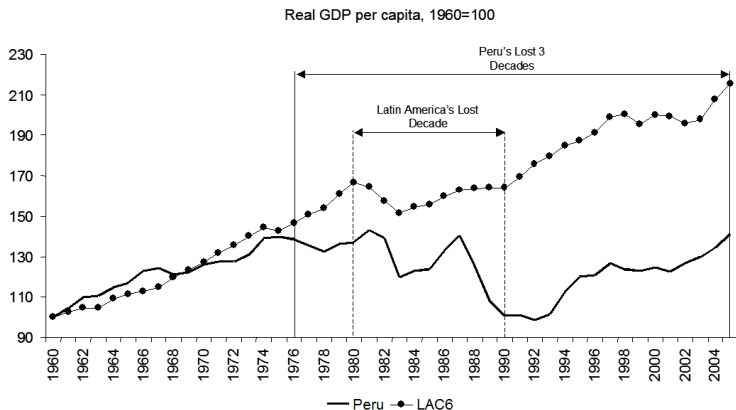
Note: LAC6 is the simple average of real GDP per capita Argentina, Brazil, Chile, Colombia, Mexico and Venezuela

Source: WDI. Own calculations

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- Describe Peru's Great Depression.
    - Hypotheses about the deep collapse and slow recovery

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- Very hard to find a **single** factor.

- 1980s **external shocks** were amplified by domestic features of the economy:

  - A weak and fractionalized **political system**

  - Lack of a coherent **industrial policy**

  - Limited domestic **entrepreneurial capacity**

- All these undermined the ability to develop new economic activities

# Related literature

**Economic crises**

- Calvo et. al (2006), Cerra and Saxena (2007), Kehoe and Prescott (2007)...

**Economic Growth in Peru**

- Torp and Bertram (1978), Beltran and Seminario (1998), Carranza et. al. (2005), ...

**Bad luck versus bad policies in EM**

- Calvo (2005), Rodrik (1999)...

**Finance and economic activity**

- Levin (2004), Rajan and Zingales (1998)...

**Labor market rigidities and economic activity**

- Hopenhayn and Rogerson (1993), Saavedra and Torero (2004)...

**Exports and economy activity**

- Hausmann and Rodrik (2003), Hausmann et. al. (2005), Hausmann and Klinger (2006)...

# Roadmap

**1** **Peru's lost three decades**

**2** **Trying to Explain Peru's Growth Performance**

**3** **Obstacle to Manufacturing Growth: A Sector-Level Analysis**

## Peru's lost three decades

- Peru's unusually large recession followed by an unusually slow recovery.. ▸ Details

- Growth contractions in GDP per capita data 1965-2005: 782 episodes.

  - Peru stand out by its unusually **large collapse** and **lenghtly recovery**

  - It also stands out by its large output cost

# Trying to Explain Peru's Growth Performance

- What can explain Peru's dismal growth performance?

# Trying to Explain Peru's Growth Performance

- What can explain Peru's dismal growth performance?

- **Initial conditions**: very **vulnerable** prior to the 1980s (Torp and Bertram 1978)

  - Post pacific war: GDP per capita grew 1 percent on average

  - Geographical fragmentation

  - Resource led economy $\longrightarrow$ possible RER overvaluation (Dutch disease)

  - Unsuccessful and isolationist policies (e.g. 1959 industrial promotion law)

  - Income inequality $\longrightarrow$ political fragmentation

# External shocks (bad luck)

- 1980s Peru's **perfect storm**: mutual reinforcing negative effects

  - (i) external shocks (ii) political instability, (iii) inability to develop new activities

- **External shocks** : key role in **igniting** Peruvian growth collapse in the 1980s

  - Real shocks (terms of trade shocks) and financials (sudden stops)

- External shocks cannot fully explain the depth of the collapses

  - Other countries received the same large negative external shocks in the 1980s
  - Unusually large collapse even after conditioning by external shocks. ▸ Details

# Bad policies

- **Bad policies** reinforced the effect of **external shocks**

    - Large external shocks would have required a set of unpopular adjustment policies

    - But political fragmentation did not allow reaching the national consensus

- **Inconsistent and erratic policies**   ▸ Details
    - Mismanagemente of fiscal and monetary policies
    - Unpredictable policy swings

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    - Unpredictable policy swings

- **Vicious feedback** between low growth and policy instability (Rodrik 1999)
    - However, difficult to establish causality (endogeneity)
    - Moreover, other Latin American countries suffered from the same problems

# Obstacles to Manufacturing Growth

- **Third element** : inability to develop new industries

- Sector-level analysis
    - UNIDO value-added data from 1974–1996
    - Latinamerica and Asia (similar initial conditions in the 1970s)

- Peruvian industries grew slower than Latam and Asia.   ▸ Details

# A Sector-Level Analysis

- We explore three possible answers:
    - (i) Lack of **financing**; (ii) Labor **rigidities**; (iii) Lack of **export capacity**.

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- Econometric specification:

$$VAGR_{i,j,t} = \alpha_{i,t} + X_{(i),j} \left[ \beta + \gamma LAC_i + \rho PERU_i \right] + \epsilon_{i,j,t}$$

- $VAGR$: value added growth in country $i$, sector $j$ and period $t$
- $X_{(i),j}$: characteristic of sector $j$ (possibly $i$-varying)
- $LAC$: dummy for countries/sectors in Latin America (LAC6, OT)
- $PERU$: dummy for sectors in Peru

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- $\gamma > 0$ Latam sectors with higher $X_{j,(t)}$ grew faster than similar Asian sectors

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- $\beta > 0$ Asian sectors with higher $X_{j,(t)}$ grew faster than other Asian sectors
- $\gamma > 0$ Latam sectors with higher $X_{j,(t)}$ grew faster than similar Asian sectors
- $\rho > 0$ Peruvian sectors with higher $X_{j,(t)}$ grew faster than similar Asian sectors

# Lack of Financing

- Causal relationship going from access to finance to growth (Levine 2004).

    - Plausible factor since peruvian credit market is extremely small
    - $X_j$ : Rajan and Zingales (1998) sector $j$ demand for external finance (EXFIN)

**Table 7: Growth and Finance**

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| EXFIN | 0.015 | 0.022 | 0.014 | 0.013 | 0.015 | 0.022 | 0.014 | 0.013 |
|  | (3.91)*** | (2.13)** | (3.65)*** | (2.45)** | (3.91)*** | (2.13)** | (3.65)*** | (2.45)** |
| EXFIN*LAC | -0.011 | -0.028 | -0.005 | -0.014 |  |  |  |  |
|  | (2.27)** | (1.90)* | (0.85) | (1.63) |  |  |  |  |
| EXFIN*PER | 0.010 | 0.075 | 0.018 | -0.020 | -0.000 | 0.047 | 0.013 | -0.034 |
|  | (3.63)*** | (7.20)*** | (4.03)*** | (3.20)*** | (0.11) | (4.47)*** | (3.28)*** | (6.27)*** |
| EXFIN*OT |  |  |  |  | -0.009 | -0.029 | -0.003 | -0.012 |
|  |  |  |  |  | (1.46) | (1.79)* | (0.32) | (0.92) |
| EXFIN*LA6 |  |  |  |  | -0.012 | -0.027 | -0.007 | -0.015 |
|  |  |  |  |  | (2.64)** | (1.30) | (1.41) | (1.85)* |
| Observations | 9987 | 2524 | 4355 | 3108 | 9987 | 2524 | 4355 | 3108 |
| N. of cy | 396 | 104 | 169 | 123 | 396 | 104 | 169 | 123 |
| Period | 1974- | 1974- | 1980- | 1990- | 1974- | 1974- | 1980- | 1990- |
|  | 1996 | 1979 | 1989 | 1996 | 1996 | 1979 | 1989 | 1996 |

Robust t statistics in parentheses. Standard errors are clustered at the country-year level. All regressions include country-year fixed effects. * significant at 10%; ** significant at 5%; *** significant at 1%

# Labor market frictions

- Labor laws (1970s and 1980s) made the Peruvian labor market extremely rigid.
- "Most restrictive, protectionist and cumbersome" Saavedra and Torero (2004)

  - $X_{i,j}$ : Sector $j$ labor intensity in country $i$, i.e. $LI_{i,j} \equiv \frac{1}{22} \sum_t \frac{VA_{i,j,t}}{EMP_{i,j,t}}$

**Table 8: Growth and Labor Intensity**

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | ( |
|---|---|---|---|---|---|---|---|---|
| LI | 0.007 | -0.021 | 0.015 | 0.018 | 0.007 | -0.021 | 0.015 | 0.0 |
|  | (1.10) | (2.23)** | (1.89)* | (1.99)* | (1.10) | (2.23)** | (1.89)* | (1.9 |
| LI*LAC | -0.002 | 0.026 | -0.004 | -0.021 |  |  |  |  |
|  | (0.22) | (2.38)** | (0.40) | (1.84)* |  |  |  |  |
| LI*PER | -0.011 | 0.037 | -0.038 | -0.012 | -0.013 | 0.063 | -0.041 | -0.0 |
|  | (4.09)*** | (7.10)*** | (9.10)*** | (1.56) | (2.04)* | (6.63)*** | (5.10)*** | (3.75 |
| LI*OT |  |  |  |  | -0.005 | 0.021 | -0.004 | -0.0 |
|  |  |  |  |  | (0.73) | (1.87)* | (0.41) | (2.1 |
| LI*LA6 |  |  |  |  | 0.006 | 0.040 | -0.004 | -0.0 |
|  |  |  |  |  | (0.64) | (3.38)*** | (0.29) | (0. |
| Observations | 13068 | 3441 | 5886 | 3741 | 13068 | 3441 | 5886 | 37 |
| N. of cy | 533 | 142 | 237 | 154 | 533 | 142 | 237 | 15 |
| Period | 1974-1996 | 1974-1979 | 1980-1989 | 1990-1996 | 1974-1996 | 1974-1979 | 1980- | 19 |
|  |  |  |  |  |  |  | 1989 | 19 |

Robust t statistics in parentheses. Standard errors are clustered at the country-year level. All regressions include country-year fixed effects. * significant at 10%; ** significant at 5%; *** significant at 1%

# Export capacity

- Exports as a source of growth (e.g. several East Asian economies)
- Isolationist policies (Velasco), possible Dutch disease, non-selective policy

  - $X_j$ : Borensztein and Panizza (2006) sector $j$ export orientation (EXPOU)

**Table 9: Growth and Export Orientation**

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| EXPOU | 0.002 | 0.016 | -0.005 | 0.000 | 0.002 | 0.016 | -0.005 | 0.000 |
|  | (0.36) | (1.30) | (0.65) | (0.02) | (0.36) | (1.30) | (0.65) | (0.02) |
| EXPOU*LAC | 0.001 | 0.016 | -0.005 | 0.004 |  |  |  |  |
|  | (0.08) | (0.67) | (0.51) | (0.25) |  |  |  |  |
| EXPOU*PER | -0.038 | 0.084 | -0.107 | -0.040 | -0.038 | 0.100 | -0.112 | -0.036 |
|  | (5.47)*** | (0.90) | (13.05)*** | (5.95)*** | (5.51)*** | (8.15)*** | (16.14)*** | (2.42)** |
| EXPOU *OT |  |  |  |  | -0.003 | 0.021 | -0.015 | 0.005 |
|  |  |  |  |  | (0.28) | (1.00) | (1.27) | (0.28) |
| EXPOU *LA6 |  |  |  |  | 0.007 | 0.008 | 0.014 | 0.003 |
|  |  |  |  |  | (0.38) | (0.15) | (0.78) | (0.15) |
| Observations | 11785 | 2905 | 5303 | 3577 | 11785 | 2905 | 5303 | 3577 |
| N. of cy | 449 | 112 | 201 | 136 | 449 | 112 | 201 | 136 |
| Period | 1974-1996 | 1974-1979 | 1980-1989 | 1990-1996 | 1974-1996 | 1974-1979 | 1980-1989 | 1990-1996 |

Robust t statistics in parentheses. Standard errors are clustered at the country-year level. All regressions include country-year fixed effects. * significant at 10%; ** significant at 5%; *** significant at 1%

# But, what type of exports?

- Not all types of exports have the same effect on growth
    - Countries that export the **same type of goods** which are exported by AE tend to grow faster, Hausmann et al. (2005)
    - Peru ranks below LAC and Asia. ▸ Details
    - $X_j$ : sector $j$ EXPOU in an advanced economy

**Table 10: Growth and Export Orientation of Advanced Economies**

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| EXPIND | 0.009 | 0.025 | 0.002 | 0.007 | 0.009 | 0.025 | 0.002 | 0.007 |
|  | (2.28)** | (2.67)** | (0.42) | (0.90) | (2.28)** | (2.67)** | (0.42) | (0.90) |
| EXPIND*LAC | -0.013 | -0.030 | -0.000 | -0.018 |  |  |  |  |
|  | (2.46)** | (2.50)** | (0.01) | (1.93)* |  |  |  |  |
| EXPIND*PER | -0.009 | -0.018 | 0.003 | -0.025 | -0.021 | -0.048 | 0.003 | -0.043 |
|  | (2.68)** | (2.46)** | (0.75) | (5.16)*** | (5.20)*** | (5.03)*** | (0.56) | (5.32)*** |
| EXPIND*OTH |  |  |  |  | -0.014 | -0.027 | -0.004 | -0.020 |
|  |  |  |  |  | (2.29)** | (2.22)** | (0.58) | (1.80)* |
| EXPIND*LA6 |  |  |  |  | -0.011 | -0.040 | 0.007 | -0.016 |
|  |  |  |  |  | (1.89)* | (1.95)* | (1.13) | (1.67) |
| Observations | 13872 | 3737 | 6180 | 3955 | 13872 | 3737 | 6180 | 3955 |
| Number of cy | 546 | 148 | 239 | 159 | 546 | 148 | 239 | 159 |
| Period | 1974- | 1974- | 1980- | 1990- | 1974- | 1974- | 1980- | 1990- |
|  | 1996 | 1979 | 1989 | 1996 | 1996 | 1979 | 1989 | 1996 |

Robust t statistics in parentheses. Standard errors are clustered at the country-year level. All regressions include country-year fixed effects. * significant at 10%; ** significant at 5%; *** significant at 1%

# Putting things together

- Horserace regression
    - Lack of access to finance : not an important obstacle
    - Worst-performing : sectors with higher labor intensity and in which AE have a comparative advantage.

**Table 11: Horserace Regressions**

|              | (1)           | (2)          | (3)           | (4)          |
|--------------|---------------|--------------|---------------|--------------|
| EXFIN*PER    | 0.011         | 0.010        | 0.002         | 0.002        |
|              | (2.63)**      | (2.29)**     | (0.73)        | (0.91)       |
| EXPIND*PER   | -0.017        | -0.015       | -0.031        | -0.033       |
|              | (3.70)***     | (3.83)***    | (6.89)***     | (9.08)***    |
| LI*PER       | -0.013        | -0.012       | -0.018        | -0.015       |
|              | (3.65)***     | (2.66)**     | (2.38)**      | (1.92)*      |
| EXPOU*PER    |               | -0.009       |               | 0.000        |
|              |               | (0.79)       |               | (0.04)       |
| Constant     | 0.129         | 0.136        | 0.128         | 0.135        |
|              | (339.23)***   | (48.05)***   | (153.96)***   | (40.87)***   |
| Other regressors | LAC       | LAC          | LAC6, OTH     | LAC6, OTH    |
| Observations | 9502          | 8815         | 9502          | 8815         |
| Number of cy | 396           | 355          | 396           | 355          |
| Period       | 1974-1996     | 1974-1996    | 1974-1996     | 1974-1996    |

Robust t statistics in parentheses. Standard errors are clustered at the country-year level. All regressions include country-year fixed effects. * significant at 10%; ** significant at 5%; *** significant at 1%

# The role of good specificity

- Why did Peru not develop industries in which AE have a comparative advantage?

    - Traditional answer from trade theory: lack of endowment to be competitive.

- Hausmann and Klinger (2006): **good specificity**

    - Measure the degree of specificity (inputs and know-how) across types of goods.
    - High specificity (e.g. extractive) $\rightarrow$ cannot easily diversify into other products
    - Low specificity (e.g. high tech) $\rightarrow$ can easily diversify into other products

- Peru ranks below LAC and Asia, even after controlling by income per capita. . ▸ Details

## Final remarks

- Peru's great depression was an extraordinary event $\longrightarrow$ three decade lost

- The elements of a perfect storm

    - Bad initial conditions

    - Ignited by external shocks and amplied by a fragile political system

    - Slow recovery : labor market rigidities and inability to develop new products

    - Vicious cycle of low growth and political misguidance/instability (Rodrik 1999)

# Related literature

■ Thorp and Bertram's (1978) interpretation of Peru's growth experience:

". . . local capacity to **innovate and adapt technology**; endogenous as distinct from external sources of economic dynamism; and policies which foster integrated growth. . . .might have permitted the economy to survive the periodic **breakdown of the export mechanism** without high cost in terms of growth. . . .It would also have prepared the economy more successfully to tackle the increasingly large scale and more complex investment projects required to sustain growth in the export sector." (Thorp and Bertram, 1978, pp 321-322)

# Growth contractions



Real GDP per capita, 1960=100
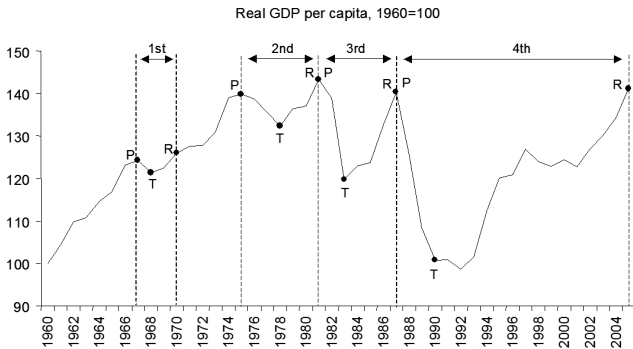
Note: P: Peak; T: Trough, R: Recovery

Source: WDI. Own calculations

‣ back

# Growth contractions

**Table 1: Output contractions in Peru**

| No. Episode | Peak | Trough | Recovery | Cumulative Output Contractions | Average Rate of Recovery | Number of years for full recovery |
|---|---|---|---|---|---|---|
| 1st | 1967 | 1968 | 1970 | -2.40% | 1.99% | 2 |
| 2nd | 1975 | 1978 | 1981 | -5.40% | 2.67% | 3 |
| 3rd | 1981 | 1983 | 1987 | -16.41% | 4.06% | 4 |
| 4th | 1987 | 1990 | 2005 | -28.23% | 2.27% | 15 |

**Table 2: Cumulative output contractions**

| | Mean | median | St dev | min | max | N.Obs |
|---|---|---|---|---|---|---|
| All Countries | -8.97% | -5.13% | 11.69% | -92.89% | -0.02% | 782 |
| LAC | -7.65% | -4.54% | 8.61% | -37.65% | -0.05% | 155 |
| Sub-Saharan Africa | -9.67% | -6.67% | 10.71% | -92.89% | -0.11% | 263 |
| East Asia & Pacific | -9.32% | -6.02% | 10.73% | -70.06% | -0.20% | 68 |
| South Asia | -3.65% | -2.65% | 4.29% | -22.50% | -0.32% | 28 |
| Europe & Central Asia | -23.17% | -12.65% | 22.15% | -76.86% | -0.16% | 48 |
| Middle East North | -10.29% | -4.92% | 13.02% | -58.16% | -0.13% | 57 |
| OECD | -2.39% | -1.52% | 2.67% | -13.19% | -0.02% | 94 |
| Non-OECD High | -9.14% | -6.16% | 11.39% | -52.08% | -0.03% | 69 |

▸ back

# Growth contractions



**Figure 3: Cumulative Contraction peak to trough**
Episodes of Output Contraction in LAC 7

Note: Own calculations.

[back]

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**Table 3: Number of years for full recovery**

| | mean | median | St dev | min | max | N.Obs |
|---|---|---|---|---|---|---|
| All Countries | 2.5 | 1.0 | 2.7 | 1.0 | 23.0 | 782 |
| LAC | 2.8 | 2.0 | 3.5 | 1.0 | 23.0 | 155 |
| Sub-Saharan Africa | 2.6 | 2.0 | 2.7 | 1.0 | 21.0 | 263 |
| East Asia & Pacific | 2.5 | 2.0 | 2.3 | 1.0 | 14.0 | 68 |
| South Asia | 1.6 | 1.0 | 0.9 | 1.0 | 4.0 | 28 |
| Europe & Central Asia | 4.2 | 3.0 | 3.5 | 1.0 | 11.0 | 48 |
| Middle East North Africa | 2.3 | 1.0 | 2.6 | 1.0 | 14.0 | 57 |
| OECD | 1.7 | 1.0 | 1.5 | 1.0 | 9.0 | 94 |
| Other High Income countries | 2.0 | 1.0 | 1.5 | 1.0 | 8.0 | 69 |

▸ back

# Growth contractions

**Figure 4: Years to full recovery**

Episodes of Output Contraction in LAC 7
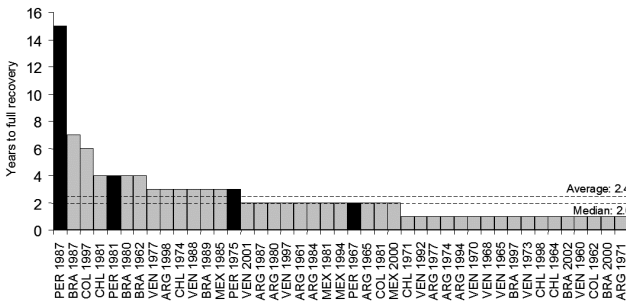


Note: Own calculations.

▸ back

# Growth contractions

- Output cost measure: $OL = \sum_{i=1}^{T} \frac{Y_p - Y_i}{Y_p}$

**Figure 6: Output Loss**

GDP per capita, 1960=100
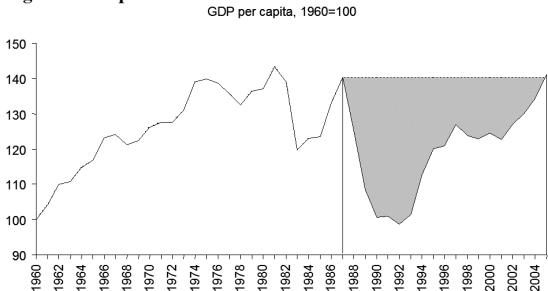


Note: The grey area shows the output loss associated to the 1987 growth collapse

▸ back

# Growth contractions

**Figure 7: Output Losses in LAC 7**



Episodes of Output Contraction in LAC 7
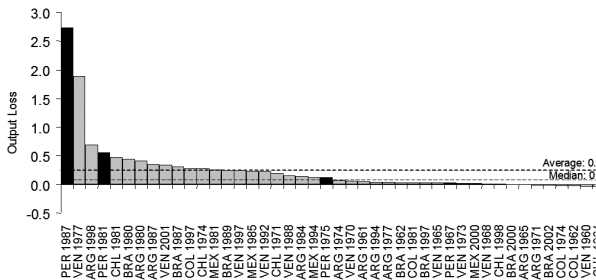
Note: Own calculations.

▸ back

# External shocks

**Figure 9: Terms of trade**
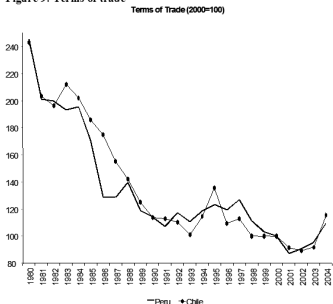


Source: WDI. Own calculations

**Figure 8: Share of primary exports**
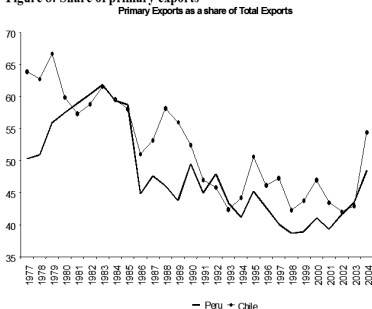


Note: Primary exports as a share of Total Exports is proxied by the sum of agricultural raw exports, fuel and metal and ores exports over merchandise and commercial service exports.

Source: WDI. Own calculations

▸ back

# External shocks

**Figure 11: Regression Scatterplot, all countries**
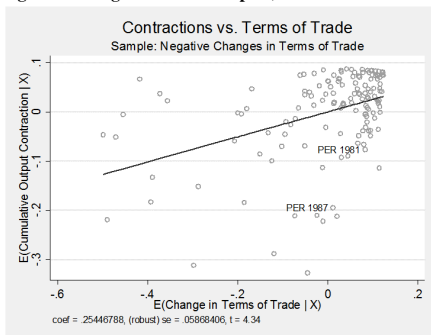
# Bad policies

**Figure 12: Fiscal Policy**



Central Government Balance
(% GDP)
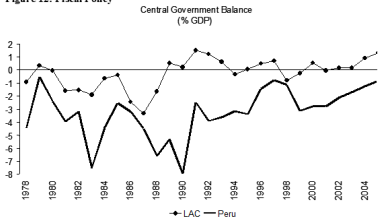
Note: LAC is the simple average of Central Government Balance (% GDP) Argentina, Colombia, Ecuador Uruguay and Venezuela

Source: The Institute of International Finance. Own calculations

**Figure 14: GDP and Chronology of Governments**
Real GDP per capita, 1960=100
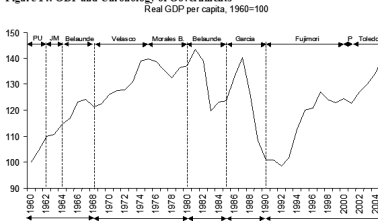


Note: PU: Prado y Ugarteche; JM: Junta Militar Godoy-Lindey; P: Paniagua

‣ back

# Industry-level analysis

**Figure 16**



PERU AND LAC
difference in yearly growth (1975-95)

▸ back

# Industry-level analysis

**Figure 17**



EAP-PER
difference in yearly growth (1975-95)
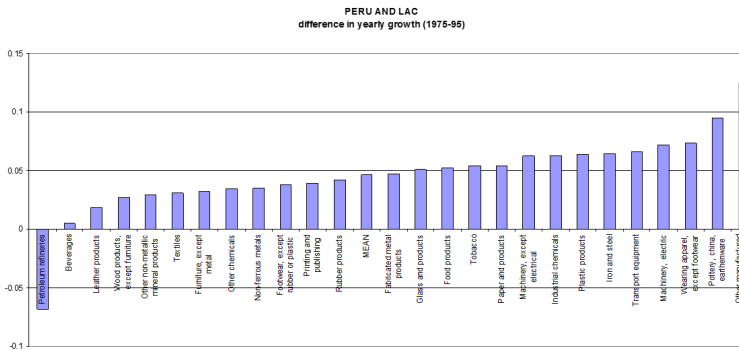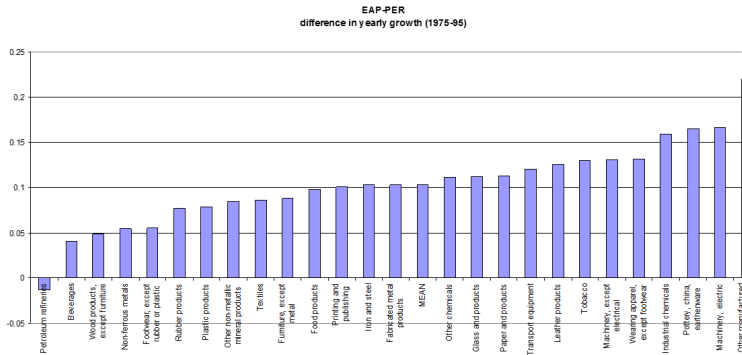
▸ back

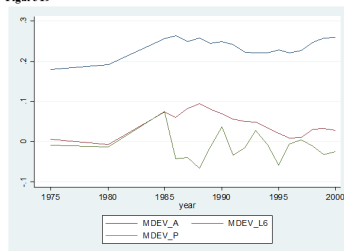# Income level of a country's exports



Figure 18   EXPY (in levels)
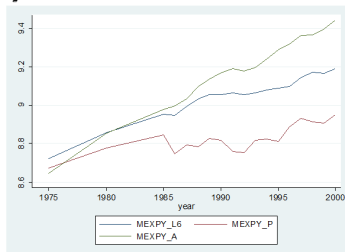


Figure 19   EXPY residuals after controlling by income per capita

‣ back

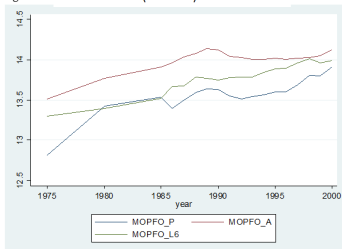# Open forest



Figure 20   OPEN FOREST (in levels)
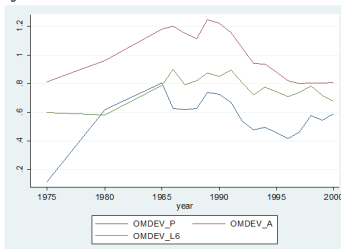


OPEN FOREST residuals after controlling
by income per capita

Figure 21

‣ back