Monetary and Fiscal History of Chile: 1960-2010

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Motivation

- Chile experienced economic and political transformations in 1960-2010
- In the early 1970s hyperinflation episodes
- In the early 1980s BOP crisis
- In both cases, real cost were very important
- Since 1990 positive rates of growth and declining inflation
- Purpose of paper: understand the role of monetary, fiscal and debt management policies in determining the macroeconomic outcomes in each case
Nominal and real volatility in different periods

Seven democratically elected governments, with a period (17 years) of an authoritarian regime

<table>
<thead>
<tr>
<th>Period</th>
<th>Growth of GDP</th>
<th>Growth of real expenditure</th>
<th>Trade Deficit</th>
<th>Current Account Deficit</th>
<th>Public Sector Deficit</th>
<th>Price of Copper</th>
<th>Inflation</th>
<th>Unemployment Rate</th>
<th>Real Exchange Rate</th>
<th>Growth of High-Powered Money</th>
<th>International Reserves</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960 - 1964 (Alessandri)</td>
<td>4.5</td>
<td>4.3</td>
<td>2.4</td>
<td>3.9</td>
<td>3.2</td>
<td>32.5</td>
<td>25.3</td>
<td>7.5</td>
<td>46.5</td>
<td>39.1</td>
<td>2.0</td>
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<td>1964 - 1970 (Frei Montalva)</td>
<td>4.2</td>
<td>5.0</td>
<td>-1.2</td>
<td>1.4</td>
<td>1.2</td>
<td>56.7</td>
<td>26.1</td>
<td>5.6</td>
<td>53.4</td>
<td>45.1</td>
<td>3.4</td>
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<tr>
<td>1970 - 1973 (Allende)</td>
<td>1.0</td>
<td>1.8</td>
<td>1.4</td>
<td>2.9</td>
<td>14.2</td>
<td>58.9</td>
<td>231.2</td>
<td>4.1</td>
<td>46.9</td>
<td>226.4</td>
<td>2.3</td>
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<tr>
<td>1973 - 1980 (Pinochet I)</td>
<td>4.0</td>
<td>2.8</td>
<td>-0.5</td>
<td>4.3</td>
<td>0.8</td>
<td>73.9</td>
<td>150.7</td>
<td>12.6</td>
<td>72.9</td>
<td>159.4</td>
<td>7.6</td>
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<td>1980 - 1990 (Pinochet II)</td>
<td>3.1</td>
<td>2.6</td>
<td>-3.3</td>
<td>6.7</td>
<td>-1.3</td>
<td>79.7</td>
<td>19.5</td>
<td>11.8</td>
<td>85.7</td>
<td>16.1</td>
<td>14.7</td>
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<td>1990 - 1994 (Aylwin)</td>
<td>7.3</td>
<td>7.8</td>
<td>-1.9</td>
<td>2.3</td>
<td>-4.1</td>
<td>103.0</td>
<td>17.7</td>
<td>6.8</td>
<td>103.4</td>
<td>26.5</td>
<td>21.4</td>
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<tr>
<td>1994 - 2000 (Frei Ruiz-Tagle)</td>
<td>5.2</td>
<td>5.2</td>
<td>-0.1</td>
<td>2.9</td>
<td>-4.3</td>
<td>99.7</td>
<td>6.1</td>
<td>6.9</td>
<td>84.4</td>
<td>14.0</td>
<td>21.0</td>
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<tr>
<td>2000 - 2006 (Lagos)</td>
<td>4.7</td>
<td>5.9</td>
<td>-5.3</td>
<td>0.2</td>
<td>-3.7</td>
<td>101.1</td>
<td>2.9</td>
<td>8.6</td>
<td>96.2</td>
<td>10.1</td>
<td>18.7</td>
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<tr>
<td>2006 - 2010 (Bachelet)</td>
<td>3.8</td>
<td>6.3</td>
<td>-9.8</td>
<td>-2.1</td>
<td>-6.4</td>
<td>304.5</td>
<td>3.8</td>
<td>7.3</td>
<td>93.8</td>
<td>14.1</td>
<td>12.6</td>
</tr>
</tbody>
</table>
Plan of the paper

- Discuss three historical episodes and economic policies
  - From stabilization to BOP crisis: 1974-1987 (Pinochet)
  - Fiscal discipline, fiscal rules and IT: 1990-2010 (Democracy)
Inflation a problem in the 1960s. Exacerbated since 1971
Nominal Volatility and Fiscal Deficits: 1960-1973

Inflation an high-powered money

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Inflation an high-powered money, beyond Allende’s govt.
Budget constraint of government

- Budget constraint in an open economy:

\[ B_t + M_t + b_t P_t + b_t^* E_t = D_t P_t + B_{t-1} R_{t-1} + M_{t-1} + b_{t-1} r_{t-1} P_t + b_{t-1}^* r_{t-1}^* E_t \]

- This can be written in terms of debt changes, interest payments and fiscal deficits:

\[ \Delta \theta_t^N + \Delta \theta_t^r + \Delta \theta_t^* \xi_t + \left( \frac{\Delta M_t}{P_t} \right) \frac{1}{y_t} = \theta_{t-1}^N \left( \frac{R_{t-1}}{\pi g_{t-1}} - 1 \right) + \theta_{t-1}^r \left( \frac{r_{t-1}}{g_{t-1}} - 1 \right) + \xi_t \theta_{t-1}^* \left( \frac{r_{t-1}^*}{\pi g_{t-1}} - 1 \right) + d_t \]
Public deficits increased from 8.1% in 1971 to 23% in 1973.
Foreign lending, $\Delta \theta_t^* \xi_t$, declined between 1971 and 1973.
Domestic debt, $\Delta \theta^N_t$, increased between 1971 and 1973.
Seigniorage main source of funding (1971-1973)
Seigniorage declined for high values of inflation

Table: Inflation and Seigniorage

<table>
<thead>
<tr>
<th>Year</th>
<th>( \pi_t ) (YoY variation)</th>
<th>( \frac{\Delta M_t}{P_t} ) (in 1998 $)</th>
<th>( \frac{\Delta M_t}{P_{ty_t}} ) (as % of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>32.4%</td>
<td>640.933</td>
<td>3.2%</td>
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<tr>
<td>1971</td>
<td>20.2%</td>
<td>1.854.928</td>
<td>8.4%</td>
</tr>
<tr>
<td>1972</td>
<td>75.2%</td>
<td>3.057.766</td>
<td>14.0%</td>
</tr>
<tr>
<td>1973</td>
<td>311.1%</td>
<td>3.393.015</td>
<td>16.3%</td>
</tr>
<tr>
<td>1974</td>
<td>586.1%</td>
<td>1.764.851</td>
<td>8.3%</td>
</tr>
<tr>
<td>1975</td>
<td>380.2%</td>
<td>1.464.828</td>
<td>7.9%</td>
</tr>
<tr>
<td>1976</td>
<td>229.5%</td>
<td>1.552.429</td>
<td>8.1%</td>
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<tr>
<td>1977</td>
<td>100.9%</td>
<td>973.117</td>
<td>4.6%</td>
</tr>
<tr>
<td>1978</td>
<td>41.1%</td>
<td>766.212</td>
<td>3.3%</td>
</tr>
<tr>
<td>1979</td>
<td>33.1%</td>
<td>734.369</td>
<td>3.0%</td>
</tr>
<tr>
<td>1980</td>
<td>35.5%</td>
<td>614.076</td>
<td>2.3%</td>
</tr>
<tr>
<td>1981</td>
<td>20.2%</td>
<td>-138.806</td>
<td>-0.5%</td>
</tr>
</tbody>
</table>
Nominal Volatility and Fiscal Deficits: 1960-1973

From 1973, on the right h.d.s of the Laffer curve
Cagan (1956) model

- We estimate the model:

\[(m_t - p_t) = -\alpha \pi_{t+1} + \psi_t\]

- As shown, by Phylaktis and Taylor (1993) if \((m_t - p_t)\) and \(\pi_t\) are I(1) and cointegrate, it is possible to estimate \((m_t - p_t) = -\alpha \pi_t\).

<table>
<thead>
<tr>
<th>Vector Error Correction Estimates</th>
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<td>Sample: 1971M01 - 1980M01</td>
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<th>Cointegrating Vector</th>
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<tr>
<td>((m - p)_{t-1})</td>
</tr>
<tr>
<td>(\pi_{t-1})</td>
</tr>
</tbody>
</table>

- Our results, suggest that \(\pi^{max} (\frac{1}{\alpha})\) is 10% in monthly terms, this implies \(\pi_t = 221\%\) annual terms.
Nominal Volatility and Fiscal Deficits: 1960-1973

Inflation that maximizes seigniorage

Inflation

CL$

1972 Inf=221%

1973

0% 100% 200% 300% 400% 500% 600% 700%

Inflation

0 500000 1000000 1500000 2000000 2500000 3000000 3500000

CL$
In April 1974 the inflation rate (measured as year on year variation) increased to more than 700%.


Inflation declined, but slowly.

This despite the sharp reduction of the fiscal deficit (was almost zero after 1974).
Seigniorage still important source of funding in 1974-1979
Between 1974 to 1980, seigniorage was larger than public deficit.

So, why inflation could not be stopped?

Accepted hypothesis: wage indexation (to past inflation) + gov. reluctance to do an abrupt adjustment.

Alternative hypothesis (to be tested): additional funds needed and not reflected in public deficit and/or lax monetary policy in the face of 1975 crisis.
In June 1979, fixed exchange regime adopted.

Inflation, at the time, still high. Wages (and some financial contracts) indexed to past inflation.

Inflation declined to single-digit levels: 9.5% in 1981.

Consensus: real appreciation induced trade balance deficits.

Appreciation also reduced the cost of foreign borrowing.
Private and public debt moved in opposite directions

- Private external debt increased from 10% (1975) to 40% (1975). Public sect from 55% (1975) to around 20% (1975)
Exchange rate collapse

- In June 1982 exchange rate regime abandoned
- Adverse international conditions: higher foreign interest rates and capital inflows reversals
- Domestic imbalances: expenditure boom induced CA deficits (14% of GDP in 1981), that became unsustainable
Exchange rate collapse. Krugman 1979 BOP model

- Following Krugman (1979), money market equilibrium:

\[ M_t = L(i_t^*) = R_t + DC_t \]

- Increase in \( i_t^* \) implied a monetary contraction:
  - Reserves, as percentage of GDP, went from 15% (1980) to 11% (1982)
  - Money rate of growth declined from 37% (1980) to -29% (1982)

- So, collapse was not due to an increase in \( DC_t \)
The fiscal burden of the crisis

- In 1982 sharp depreciation of peso and lack of international funds
- Banks (most of them) became insolvent
- Banks were not able to service its debt
- Rescue programs (by the Central Bank and Treasury) implemented
  - Bank liquidations
  - CB bought portfolios of private banks
  - Provided foreign currency at subsidized prices
Foreign debt of CB increased substantially
Rescue plan generated severe CB operational losses
From stabilization to BOP crisis: 1974-1987

Treasury: transfers to the CB, increased internal debt

Figure: Public Internal Debt (as % of GDP)
Fiscal discipline

- Chile avoided default (explicit policy since early 80s)
- Cost of the crisis assumed by Treasury and CB
- Debt position of government increased. To avoid monetization:
  - Public debt was indexed and/or in foreign currency
  - Also, long maturity of debt (30 years in case of internal debt)
Fiscal discipline, fiscal rules and IT: 1990-2010

Strategy to pay the debt: fiscal surpluses since 1987

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Fiscal rule

- In 2001 the government implemented a fiscal policy rule
- This is based on a yearly structural surplus of 1%
- Net asset position of government improved
- Debt (external and domestic) eventually paid
- This has enabled the CB to pursue independent monetary policy
Conclusions

- Chile experienced economic and political transformations in 1960-2010
- In the early 1970s hyperinflation associated to fiscal deficits
- Stabilization in the early 1980s through a fixed exchange rate policy
- Severe BOP crisis implied the abandonment of exchange rate regime
- Cost of crisis assumed by CB and Treasury
- Systematic policy of fiscal surplus since 1987 until today
  - Fiscal debt was reduced
  - An IT policy could be implemented