

# Monetary and Fiscal History of Chile: 1960-2010<sup>1</sup>

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Central Bank of Chile

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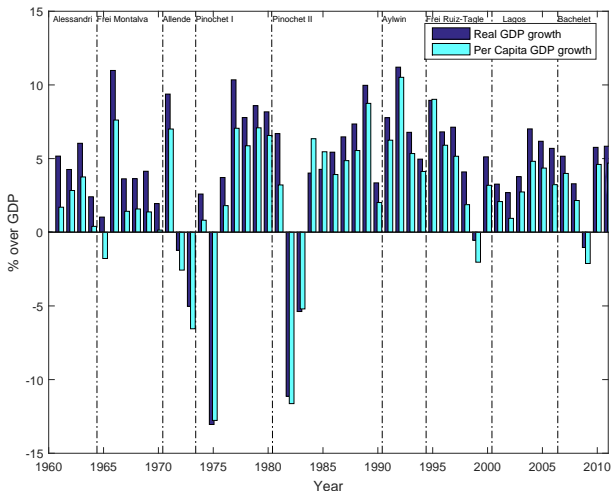
<sup>1</sup>The views expressed here are those of the authors and do not necessarily reflect the position of the Central Bank of Chile or its board members.

# Motivation

- Chile experienced economic and political transformations in 1960-2010
  - In the 1960s inflation persistently over 25% along with public deficits of around 2% of GDP
  - In the early 1970s hyperinflation episodes, massive fiscal deficits and severe contraction in GDP in specific years
  - In the early 1980s BOP crisis
  - Since mid 80s 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

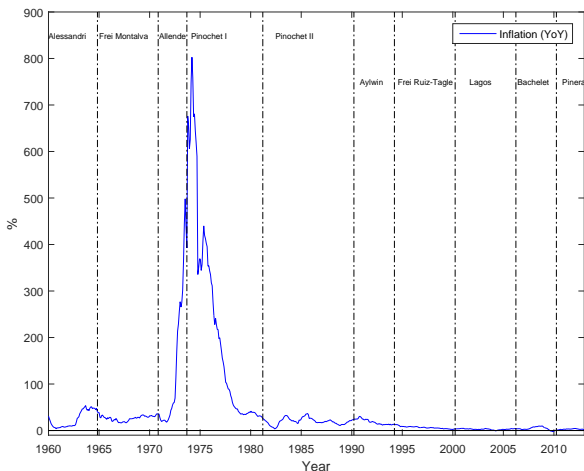
# GDP Growth

- GDP growth highly volatile in 1960-1985
- Severe economic crisis in 1973, 1975, 1982 and 1983.



# Inflation

- Inflation a problem in the 1960s. Exacerbated since 1971
- Systematic decline since 1990



# Plan of the paper: analytical framework

- Discuss fiscal deficit, debt and monetary trends

- Budget accounting exercise

$$\Delta\theta_t^N + \Delta\theta_t^r + \Delta\theta_t^*\xi_t + \left(\frac{\Delta M_t}{P_t}\right) \frac{1}{y_t} = \theta_{t-1}^N \left(\frac{R_{t-1}}{\pi_t g_t} - 1\right) + \theta_{t-1}^r \left(\frac{r_{t-1}}{g_t} - 1\right) + \xi_t \theta_{t-1}^* \left(\frac{r_{t-1}^*}{\pi_t^* g_t} - 1\right) + d_t + \tau_t$$

- Provide a systematic account of monetary and fiscal policy
- Can identify overall financing needs and sources in different periods

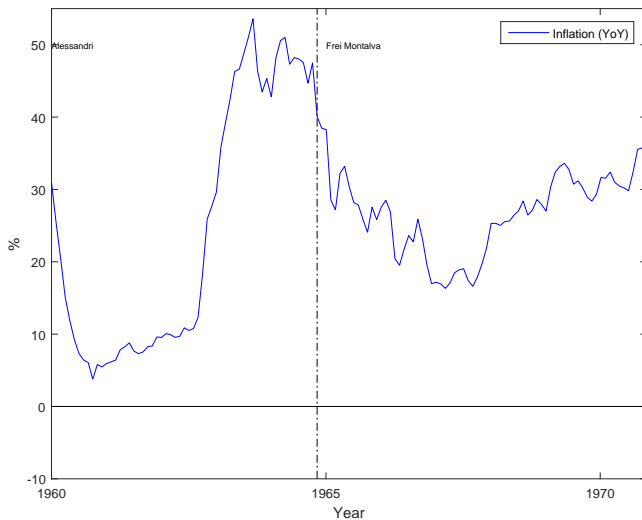
# Plan of the paper: Periods

- 1960-1970: Persistent inflation and "mild" fiscal deficits
- 1970-1981: Hyperinflation, larger deficits and delayed stabilization
- 1982-1990: The fiscal burden of BOP crisis
- 1990-2010: Declining inflation and fiscal discipline

## 1960-1970: Persistent inflation and "mild" fiscal deficits

- Two different administrations: Alessandri (1958-1964) and Frei (1965-1970)
- A common goal: to stabilize inflation (French-Davis, 1973)
- Alessandri initially succeeded, but could not contain fiscal deficits in latter stages
- Frei could reduce fiscal deficits, although inflation increased from 1967

# Inflation in 1960-1970





# Financing needs and sources 1960-1970

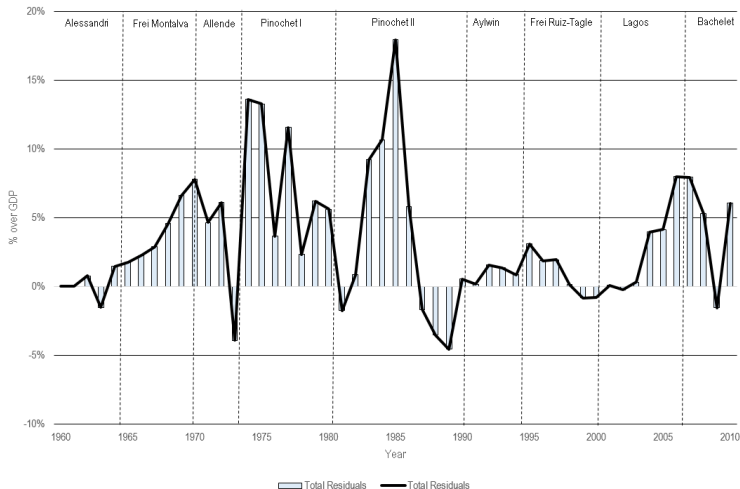
- Alessandri: seigniorage main source of financing for fiscal needs (primary deficit)
- Frei: Ext.debt additional source of financing. Seigniorage important, despite declining fiscal deficits

Table : Budget Constraint 1960-2010

Periods	1961-1964 Alessandri	1965-1970 Frei Montalva	1971-1973 Allende	1974-1981 Pinochet I	1982-1989 Pinochet II	1990-1999 Aylwin/Frei R.	2000-2010 Lagos/Bachelet
<i>Sources:</i>							
Ext. Debt	0,87%	2,13%	-3,41%	0,33%	-0,56%	-1,28%	0,09%
Dom. Debt (CLP+Ind)	-0,01%	0,09%	0,85%	-0,22%	0,34%	-0,35%	0,56%
Dom. Debt (USD)	-0,40%	0,11%	-1,32%	0,37%	2,01%	-1,12%	-0,72%
Seigniorage	2,21%	2,19%	12,87%	4,61%	0,47%	0,60%	0,45%
<b>Total</b>	2,68%	4,52%	8,98%	5,09%	2,27%	-2,14%	0,38%
<i>Obligations:</i>							
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# Extraordinary Transfers: 1960-1970

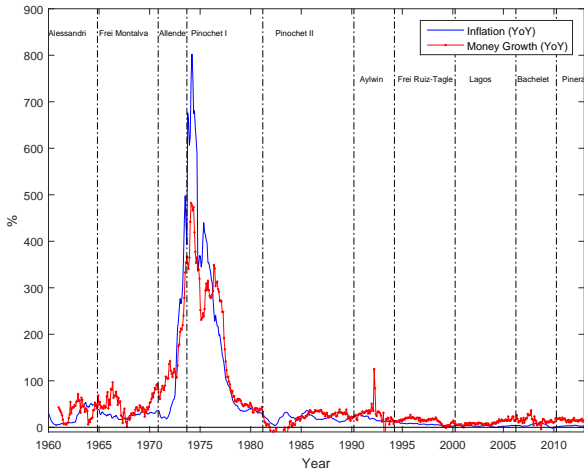
- $\tau$  nearly zero in the case of Alessandri, increased to 4.5% of GDP during Frei



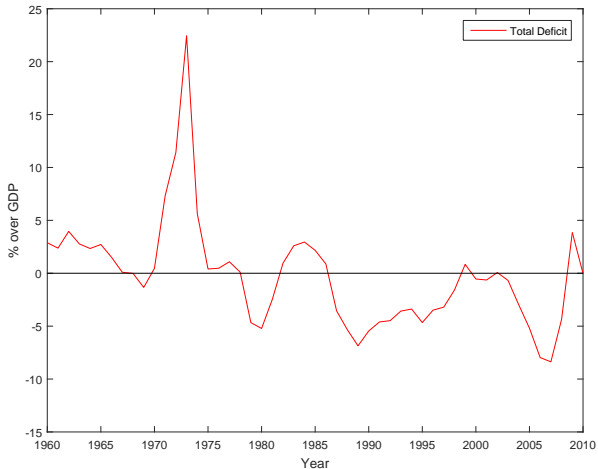
## 1970-1981: Hyperinflation, larger deficits and delayed stabilization

- Hyperinflation and large fiscal deficits in early 70s (Allende)
- Hyperinflation with fiscal adjustment (Pinochet in mid 70s)
- Seigniorage important until 1976

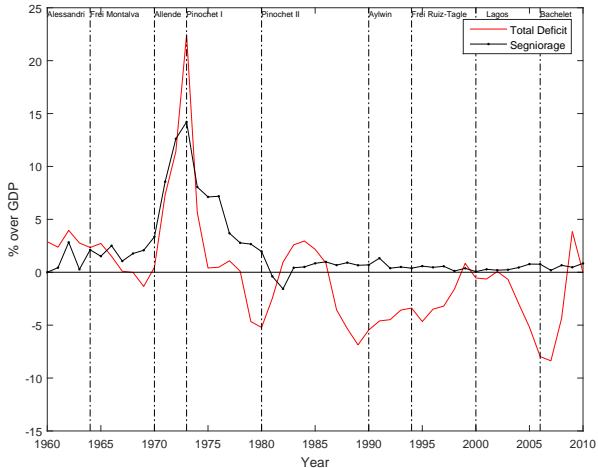
# Inflation and high-powered money



Public deficits increased from 8.1% in 1971 to 23% in 1973



# Seigniorage important source of funding (1971-1973)



# Seigniorage declined for high values of inflation

Table : Inflation and Seigniorage

Year	$\pi_t$ (YoY mean variation)	$\frac{\Delta M_t}{P_t}$ (in 1969 \$)	$\frac{\Delta M_t}{P_t y_t}$ (as % of GDP)
1970	32.63%	2.404	3.35%
1971	22.09%	6.721	8.56%
1972	112.56%	9.784	12.62%
1973	432.82%	10.464	14.21%
1974	599.92%	6.087	8.05%
1975	383.12%	4.678	7.12%
1976	251.40%	4.893	7.18%
1977	123.42%	2.772	3.69%
1978	51.59%	2.254	2.78%
1979	36.28%	2.342	2.66%
1980	35.65%	1.866	1.96%
1981	20.25%	-0.393	-0.39%

# Cagan (1956) model

- We estimate the model:

$$(m_t - p_t) = -\alpha \pi_{t+1}^e + \psi_t$$

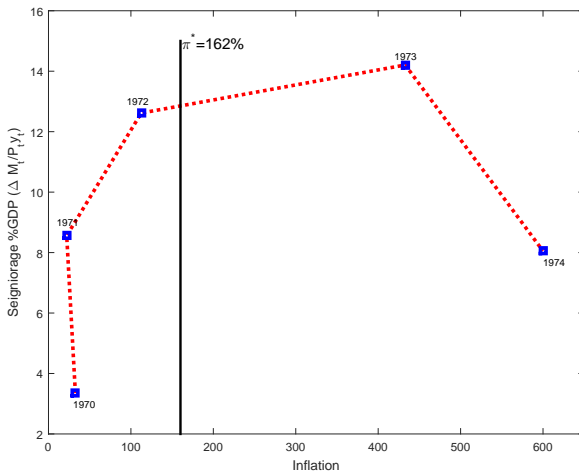
- As shown, by Phylaktis and Taylor (1993) if  $(m_t - p_t)$  and  $\pi_t$  are  $I(1)$  and cointegrate, it is possible to estimate  $(m_t - p_t) = -\alpha \pi_t$ .

Vector Error Correction Estimates	
Sample: 1971M01 1974M12	
Included observations: 48	
Standard errors in ( ) & t-statistics in [ ]	
Cointegrating Equation	
$(m - p)_{t-1}$	1.0000
$\pi_{t-1}$	12.0589 (3.19211)
	[ 3.77772]
Constant	-7.50219

- Our results, suggest that  $\pi^{\max} (\frac{1}{\hat{\alpha}})$  is 8.3% in monthly terms, this implies  $\pi_t = 162\%$  annual terms



# Inflation that maximizes seigniorage



## Persistent inflation: 1974-1978

- In April 1974 the inflation rate (measured as year on year variation) increased to more than 700%
- Potential reason: price controls removed after September 1973
- Inflation declined, but slowly
- This despite the sharp reduction of the fiscal deficit (was almost zero after 1974)

## Peristent inflation: 1974-1978

- 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

# Financing needs and sources 1970-1981

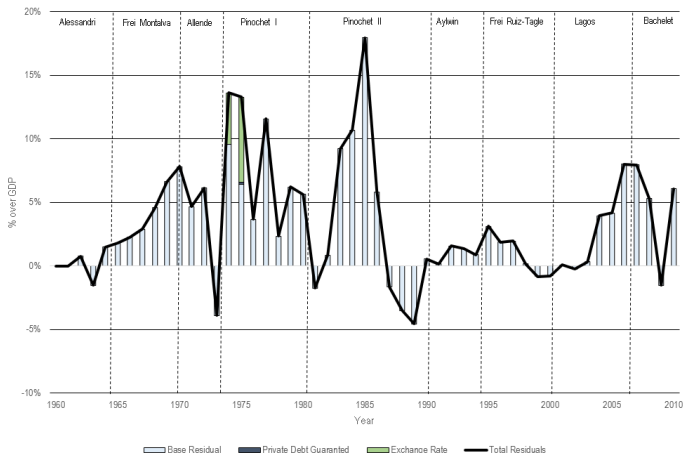
- Allende: no access to foreign debt. Seigniorage main source of funds
- Pinochet: Seigniorage still important, despite declining fiscal deficits

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# Extraordinary Transfers: 1970-1981

- In 1974 and 1975 important devaluations
- $\tau$  can be overestimated: correct based on constant RER



## Fiscal Discipline and $\tau$ : 1974-1979

- $\tau$  in this period could be interpreted in several ways
- Previsional reform argument (Diamond and Valdes-Prieto (1993))
- In the late 70s policymakers anticipated substantial previsional deficits after reform
- Hence,  $\tau$  could be used to faced future fiscal commitments

# Previsional deficit after reform increased substantially

Figure : Social Security Deficit

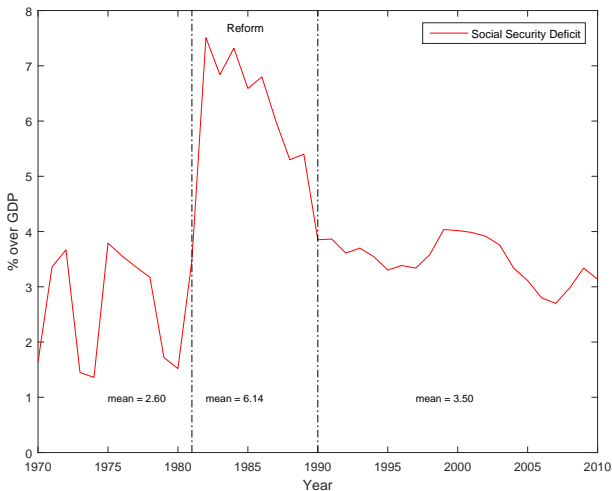
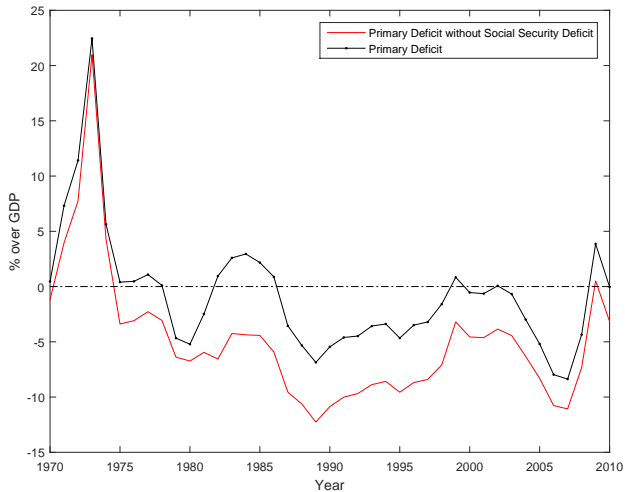


Figure : Fiscal Deficit



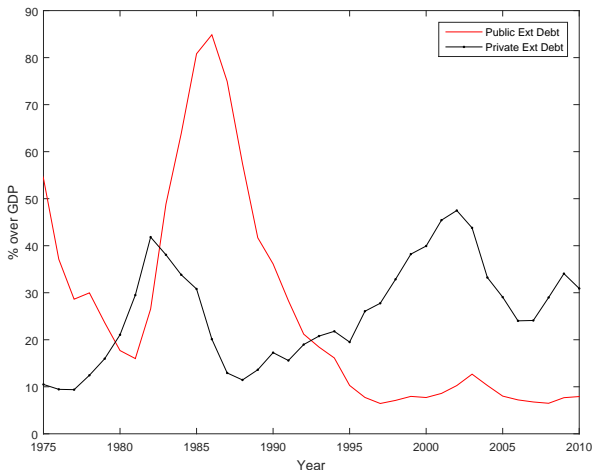


## 1982-1990: The fiscal burden of BOP crisis

- 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 sector from 55% (1975) to around 20% (1975)



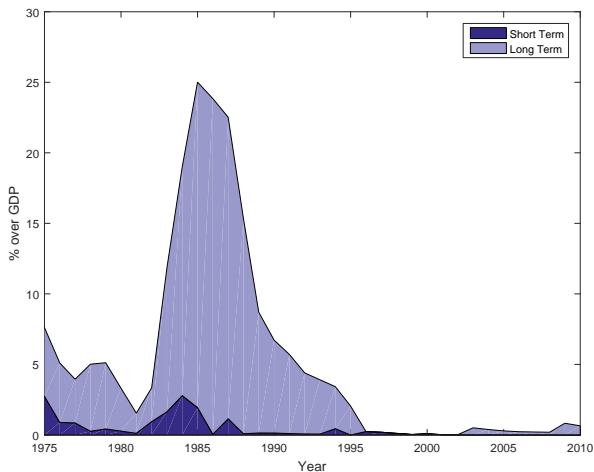
# Exchange rate collapse

- 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

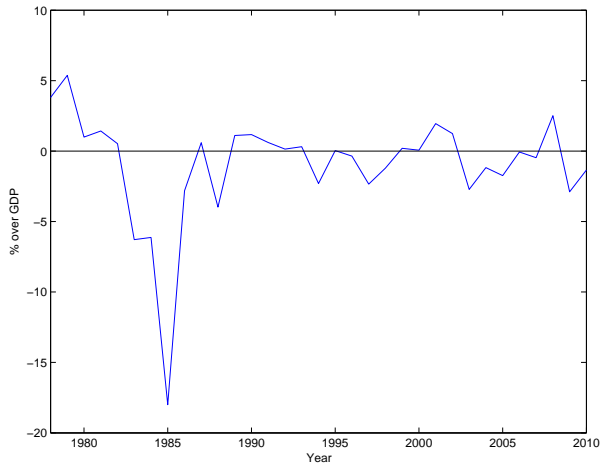
# The fiscal burden of the crisis

- 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

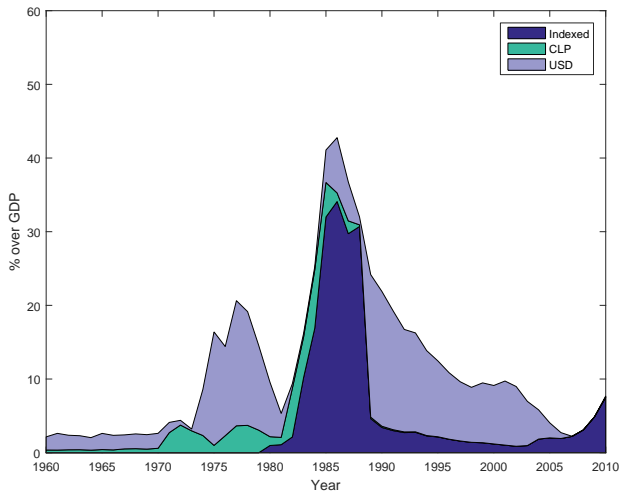
# Foreign debt of CB increased substantially



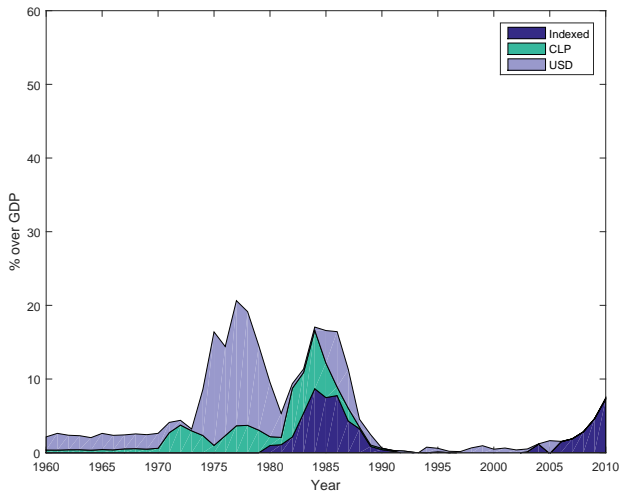
# Rescue plan generated severe CB operational losses



# Treasury: transfers to the CB, increased internal debt



# Treasury: transfers to the CB, increased internal debt





# Financing needs and sources 1982-1990

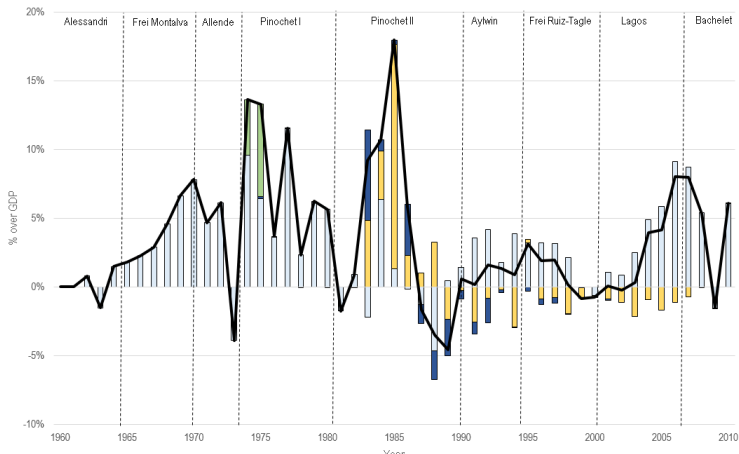
- Main source of financing related to domestic credit
- Fiscal surplus, so  $\tau$  are important (4.3% of GDP on average)

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$\tau$  reflect, mostly, transfers to the central bank

- Identify transfers, between 1984-1988, according to Law 18.358
- Compute  $\tau$  w/o Treasury bonds



# Financing needs and sources w/o Treasury Bonds

- Once excluded, financing needs decline importantly
- $\tau$  are close to zero.

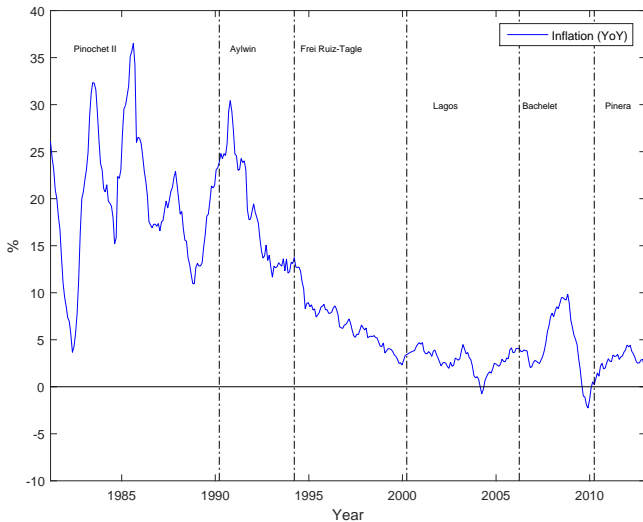
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# Declining Inflation and Fiscal Discipline: 1990-2010

- 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)

# Steady decline in inflation since 1990



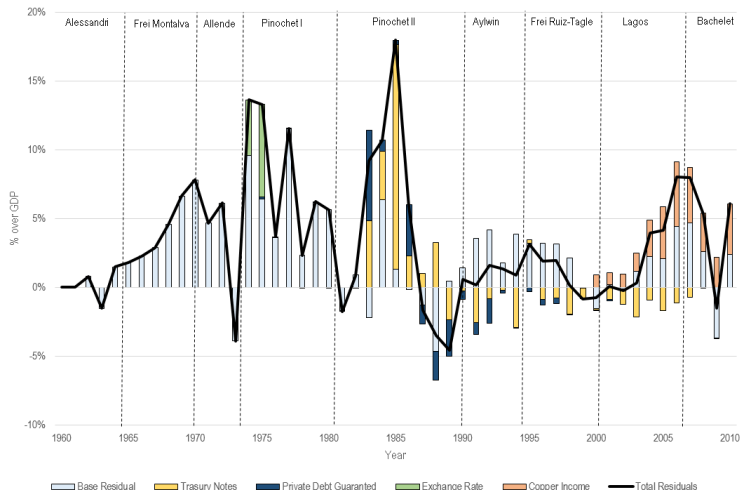
# Financing needs and sources 1990-2010

- Since 1990, systematic fiscal surpluses
- $\tau$  increased importantly in the 2000s

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# Increase in $\tau$ not only explained by copper income



# Fiscal rule and fiscal (non-copper) deficit

- 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



# Fiscal Rules in Practice: Chile 1990-2010

Following Fernandez-Villaverde et al. (2015) we estimate:

$$v_t = c + \alpha v_{t-1} + \beta(y_{t-1}^m - y_{t-1}^{HP}) + \gamma(\tau_{cu,t-1} - \bar{\tau}_{cu,t}) \quad (1)$$

Where  $v_t = \frac{(g_t - \tau_t)}{y_t^m}$ ,  $g_t$  is government spending,  $y$  is the real GDP,  $\tau_{cu,t}$  is nominal mining GDP.

# Fiscal rule more countercyclical after 2000

- In this context,  $\tau$  could be related to gov. transfers to sovereign wealth funds

Table : Fiscal Rule Estimates

	1990-2014	1990-1999	2000-2014
C	0,000 (0,002)	0,000 (0,002)	-0,001 (0,002)
$\alpha$	0,509*** (0,083)	0,616*** (0,135)	0,313** (0,126)
$\beta$	-0,112 (0,077)	-0,014 (0,052)	-0,443** (0,190)
$\gamma$	-0,013*** (0,003)	-0,006* (0,003)	-0,016*** (0,005)
$\beta^{LR}$	-0,228	-0,036	-0,645
$\gamma^{LR}$	-0,026	-0,015	-0,023
$R^2$	0,568	0,492	0,624
N	99	39	60

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Conclusions

- Chile experienced economic and political transformations in 1960-2010
- In the 1960s and 1970s inflation 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