Commodity Price Cycles and Policy Responses in Small, Open, Resource Rich Economies

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Introduction

- Several Latin American countries showed impressive progress in handling the Commodity Price shock associated to the global recession of 2008-09
- They were able to apply fiscal and monetary stimulus without causing fiscal sustainability problems, foreign exchange crisis or inflation, as was often the case in previous episodes of negative shocks in terms of trade
- However, some of the best performers in that event have run into trouble in recent years after the fall in terms of trade that began in 2011-2013
- We analyze this last episode by looking more closely to the case of Chile, which has been usually referred as the example to follow on the matter of delinking the domestic economy from copper price shocks
- Our main finding is that fiscal rules designed to neutralize the impacts of transitory shocks in commodity prices might not work well when they are persistent, especially if they bring about an investment surge into the Natural resources sector

Main issues

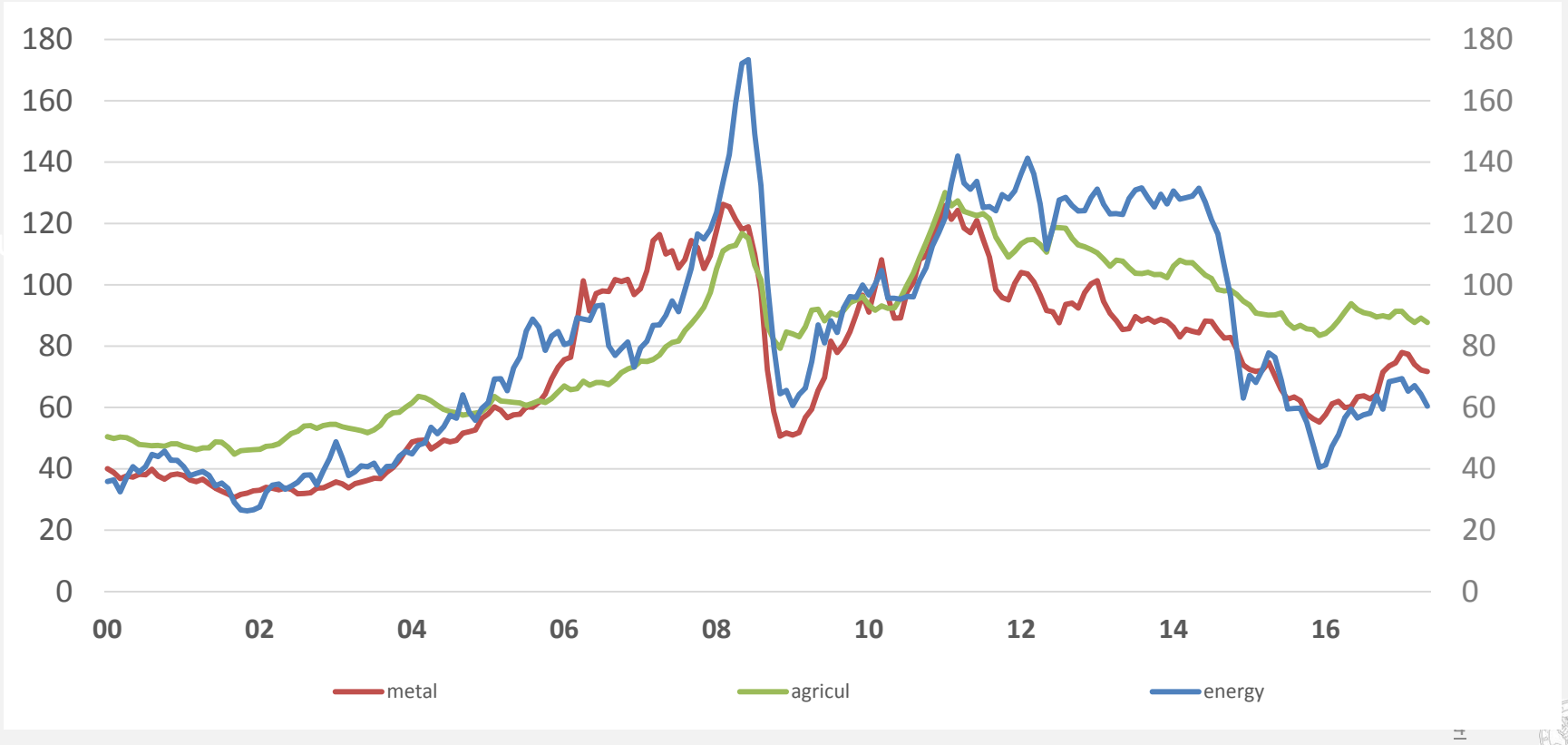
- Some specifics of the last commodity price cycle (s)
- Economic performance of some countries in Latin America
- The experience of Chile in the last cycle
- Final remarks

The last commodity price cycle (s)

1. It was a generalized commodity price shock

Figure 1: Commodity Groups Monthly Price Indices (2000-2017)

Index: 2010=100



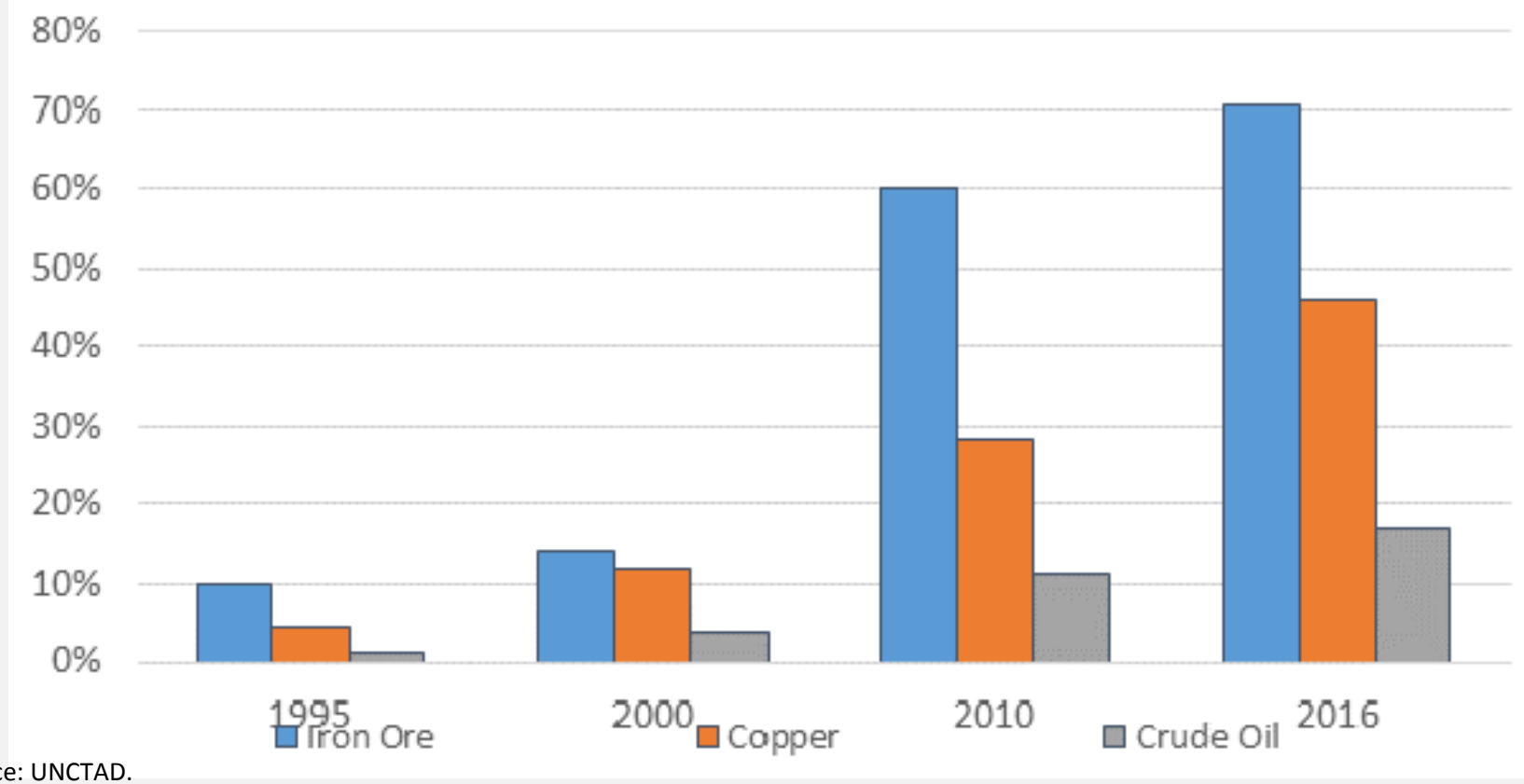
Source: World Bank Group.

The last commodity price cycle (s)

2. Chinese convergence played a major role

Figure 3: Share of Chinese Imports in Global Trade of Selected Commodities

Share of Total Imports per Commodities

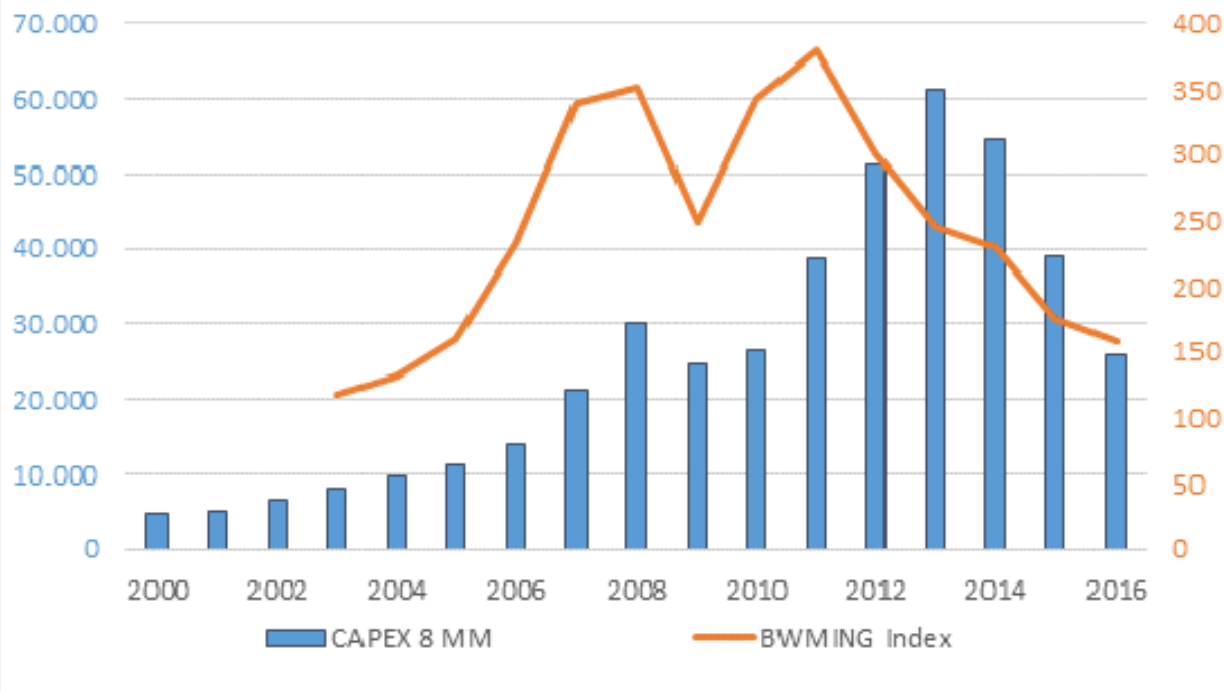


Source: UNCTAD.

The last commodity price cycle (s)

3. It brought about a large global investment surge in Natural Resources

Figure 4: CAPEX and Stock Prices of 8 Large Mining Multinationals
Million USD, and Indices



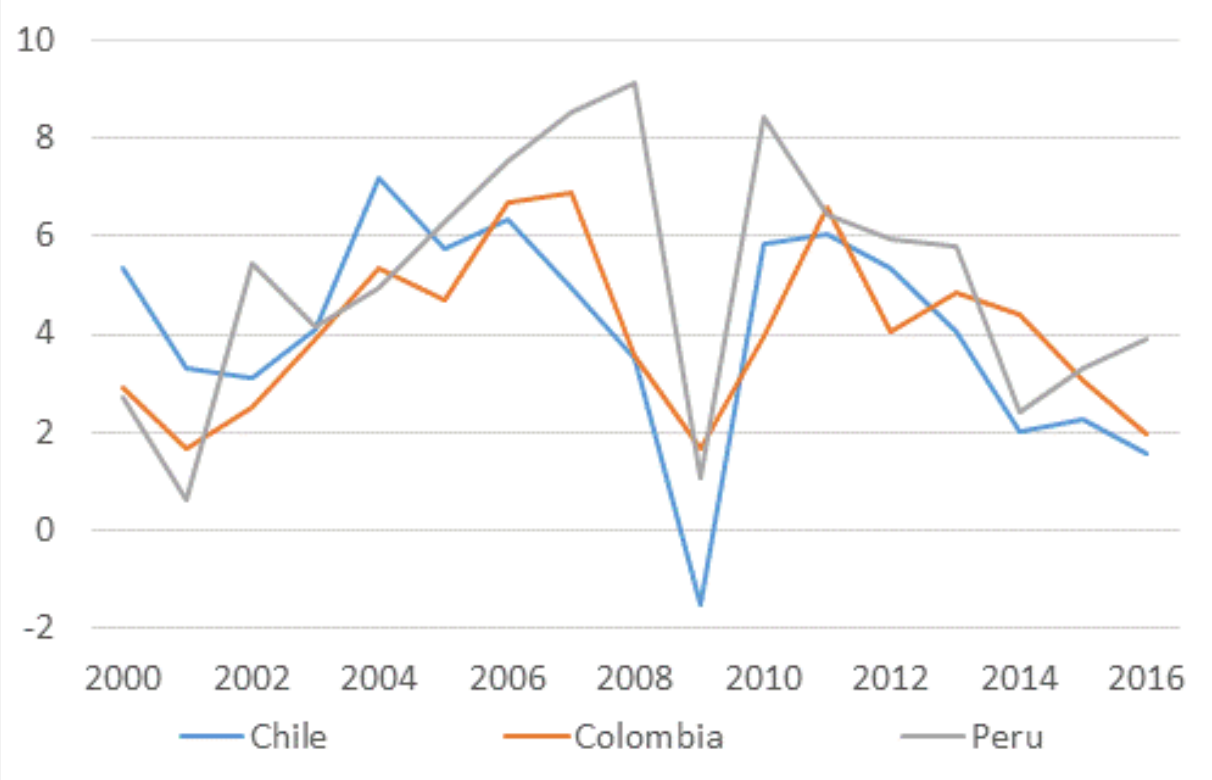
Source: Bloomberg.

Economic performance of some countries in Latin America

1. GDP growth suffered a temporary interruption in 2009, but after a quick recovery has slowed down gradually

Figure 6: Annual GDP Growth in Select Latin American Economies

Percent

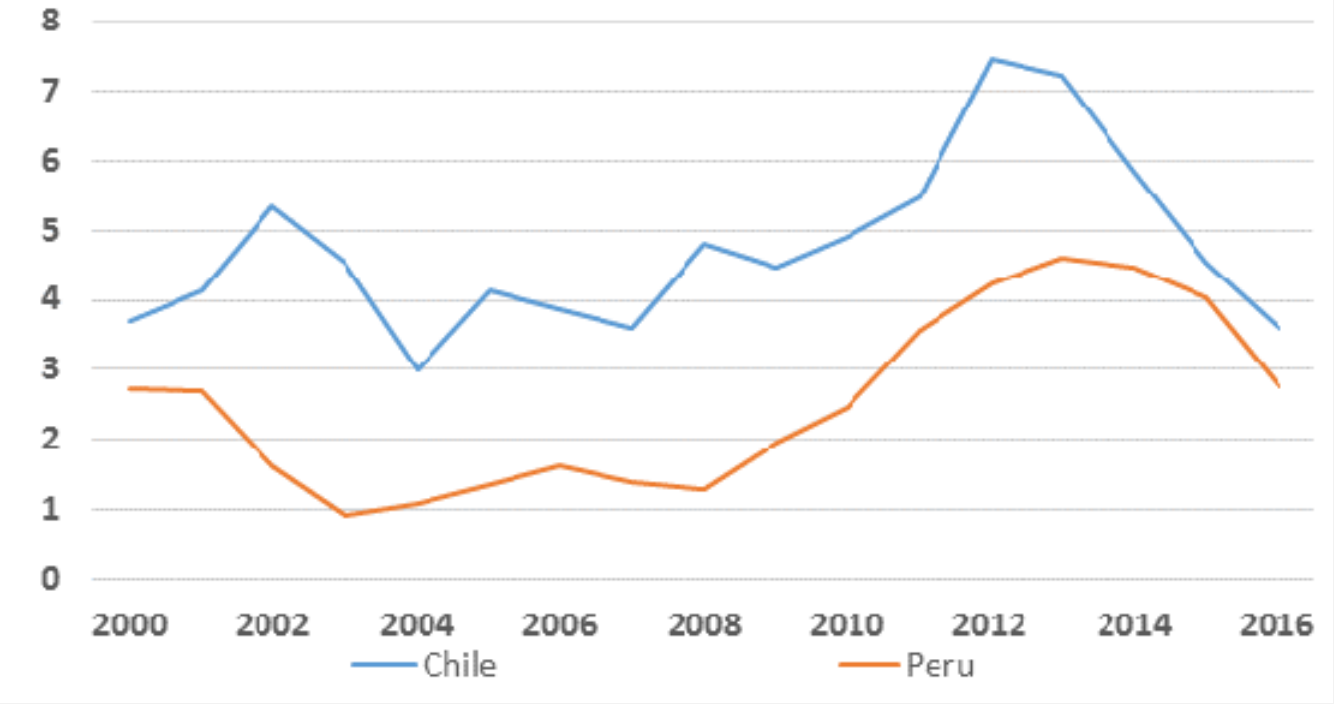


Source: IMF.

Economic performance of some countries in Latin America

2. The mining investment cycle is closely related to the overall cycle in these countries

Figure 7: Fixed Capital Investment in Mining over the Cycle
Share of Nominal GDP



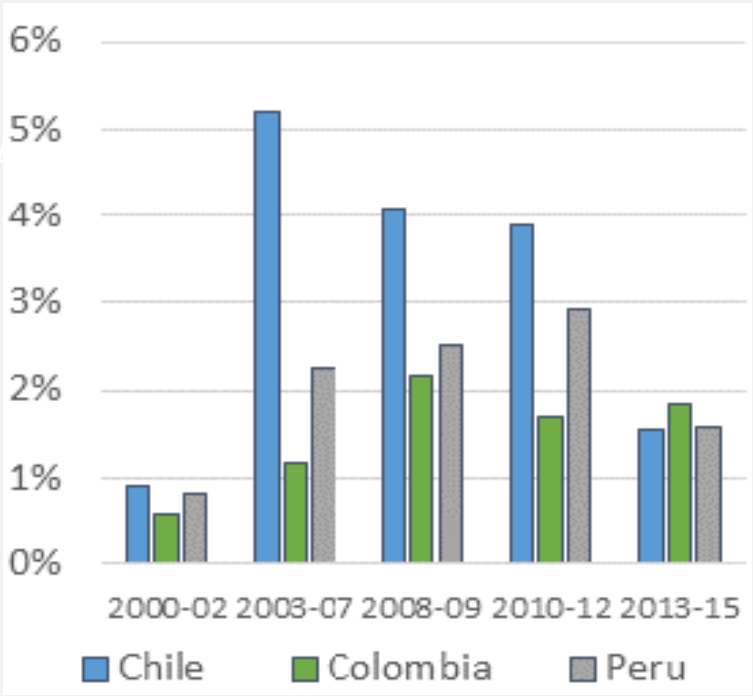
Sources: Central Banks of Chile and Peru.

Economic performance of some countries in Latin America

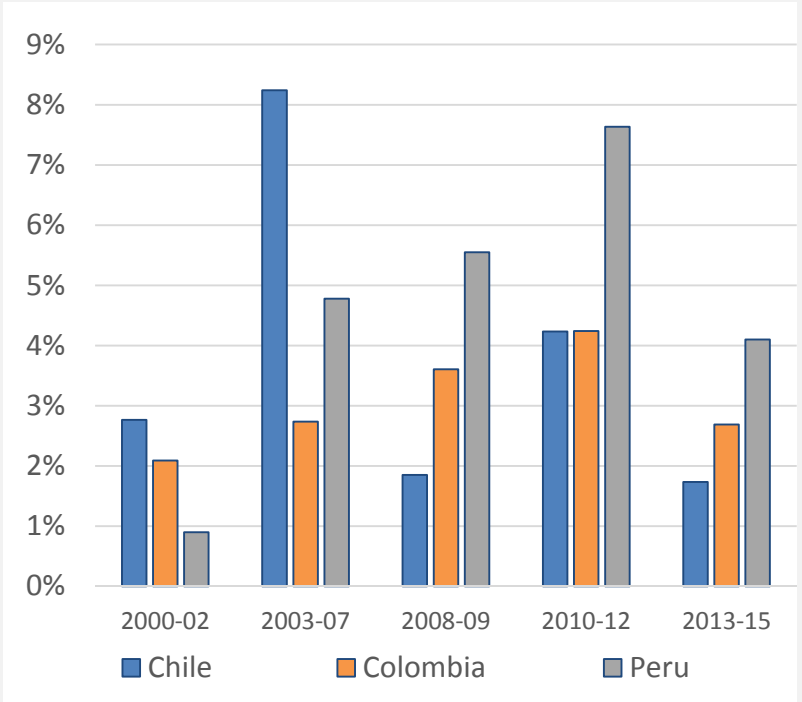
3. These countries saved a large fraction of the windfall from commodity prices

Figure 5: Fiscal Revenues & Public Savings from Commodities Throughout the Cycle
Share of Nominal GDP

A: Fiscal Revenues



B: Public Savings



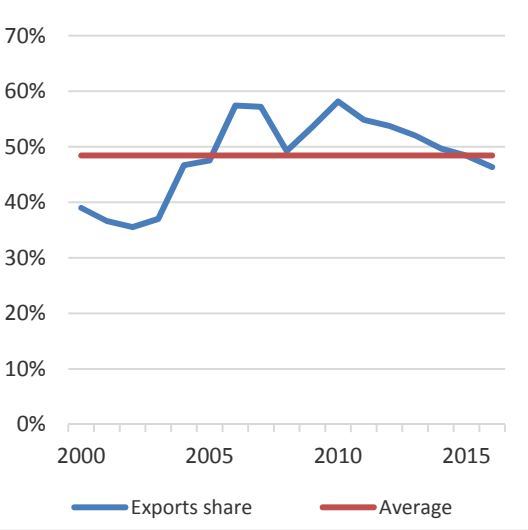
Sources: Ministries of Finance of each Economy.

The experience of Chile in the last cycle: Background

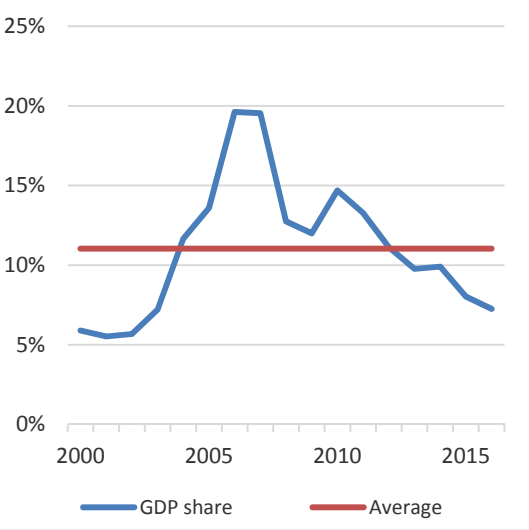
1. Copper is a key commodity for the Chilean Economy

Figure 8: Relative Importance of Copper in the Chilean Economy, 2000-2016

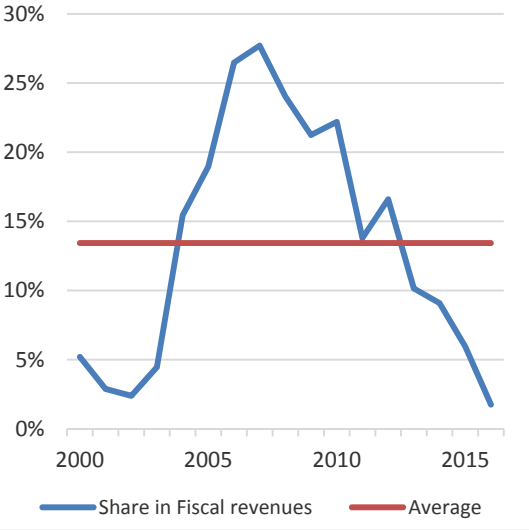
A: Copper Share of Total Exports



B: Copper Mining Share of GDP



C: Copper Receipts Share of Government Revenues



Source: Central Bank of Chile, Budget Office.

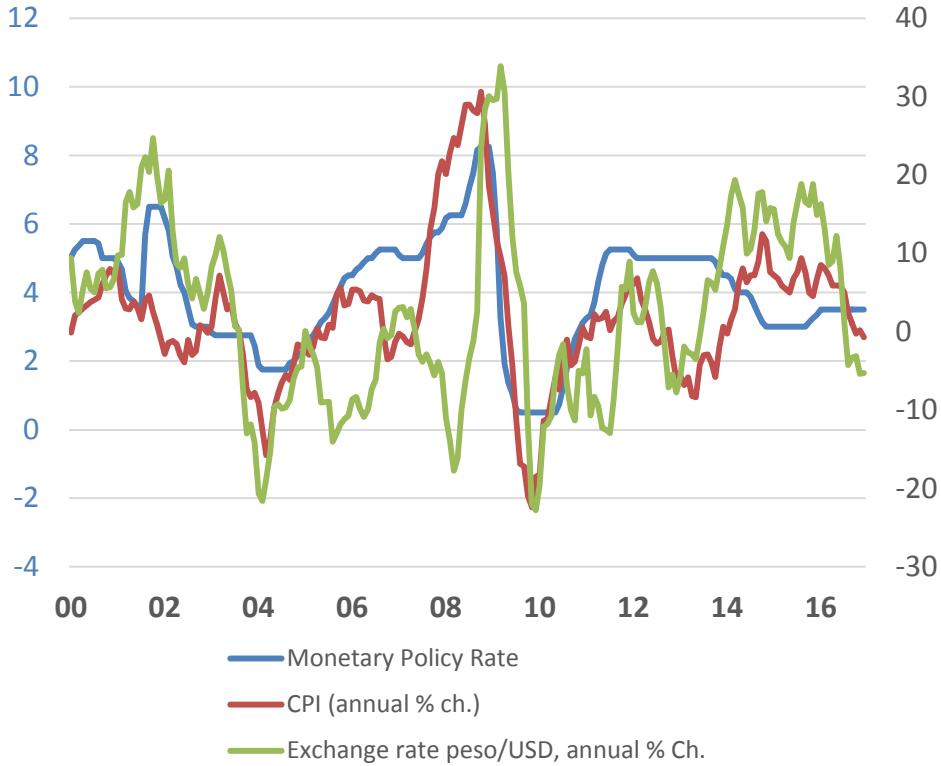
The experience of Chile in the last cycle: Background

- Very open economy, both in trade, financial flows, FDI and even labor
- Well developed financial markets, with strong supervision and a large participation of domestic institutional investors (pension funds, insurance companies)
- Introduced a Copper Stabilization Fund in the late 70s, replaced by a Structural Balance rule in 2002. Reference price for long-term price of copper and Potential GDP determined by panels of independent experts. Very strong public finances allowed to cut gross public debt from about 50% of GDP in the early 90s to just 10% at the end of that decade, remaining at that level until very recently
- Autonomous Central Bank, with prohibition to lend money to the government. Inflation targeting with exchange rate flexibility since 2001, with an inflation target of 3% (actual average since that time: 3.3%)

The experience of Chile in the last cycle: Economic Policies

Figure 14: Monetary Policy Rate, Exchange Rate Fluctuations and Inflation, 2000-2016

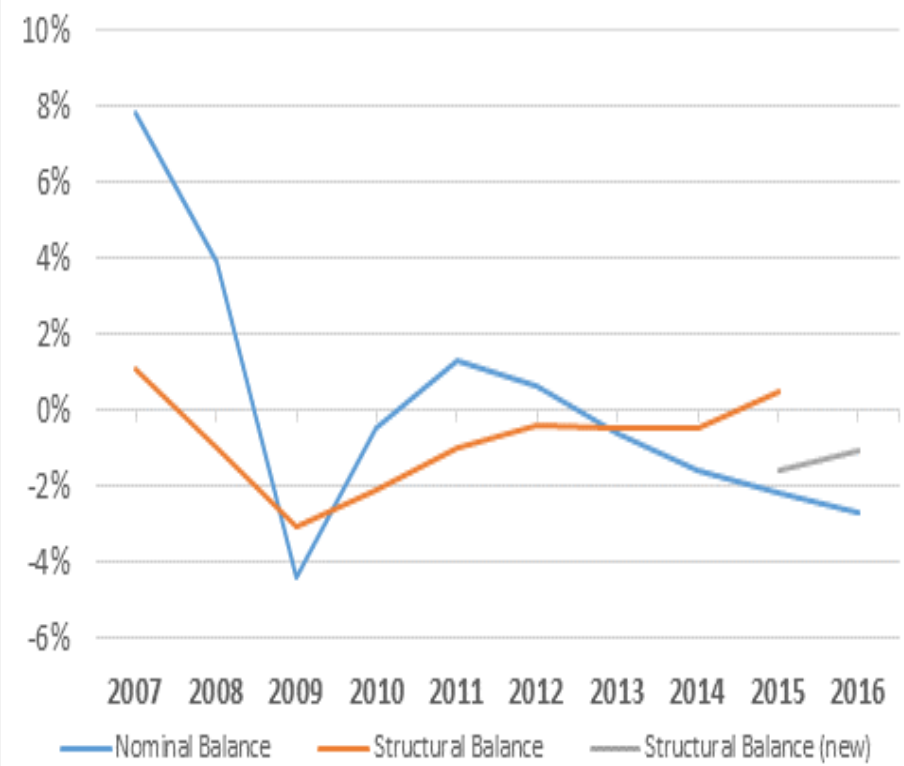
Monetary Policy Rate (percent, left axis). Other (annual variation in percent, right axis)



Source: Central Bank of Chile.

Figure 17. Fiscal Balance over the cycle; nominal and Structural

Share of Nominal GDP



Sources: Dipres. *Public Finance Report,* 2016 and "*Evaluación de las Gestión Financiera del Sector Público en 2016 y actualización de proyecciones para 2017*", July 2017.

The experience of Chile in the last cycle: The initial phase 2003 - 2011

- The key parameters in the fiscal rule (Potential growth and reference price of copper) were revised upwards very gradually, but especially the latter one rose significantly as the shock persisted beyond the usual length of the cycle.
- There was a large accumulation of fiscal savings and, starting in 2007, high rates of expansion of government expenditures.
- When markets collapsed in September 2008 the price of copper followed, domestic confidence fell and domestic demand contracted. Credit contraction by US banks had a severe impact in short term financing of international trade.

Policy responses:

- Large fiscal expansion in 2009, even beyond the special program valued at the time in 3.5% of GDP. mostly focused on transitory expenses and tax reductions.
- Reconstruction after the Feb. 2010 earthquake put additional pressure on investment in 2010 and 2011.
- Initially the Central Bank was severely constrained to take the lead, due to the fast rise in inflation in 2007-08. However, it provided USD liquidity to the banks to compensate for the closure of foreign sources of short-term funding and once inflation began to fall, it cut interest rates very aggressively

The experience of Chile in the last cycle: The final phase 2012 - 2016

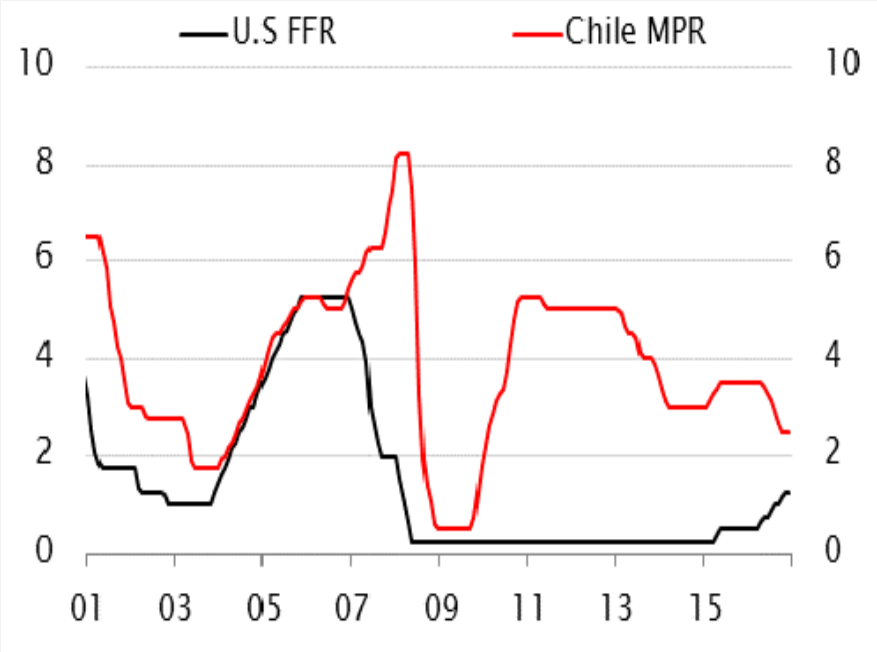
- Copper revenues began to fall in response to higher costs and falling prices.
- Mining investment (mostly financed by FDI) began to contract globally for the same reasons. In Chile the adjustment came early than in other countries because most projects were expansions of existing operations.
- Estimates of parameters for the fiscal rule were slow to recognize the change in trend (both potential growth and the reference price of copper).
- The government faced rising expenditure commitments and falling revenues (actual and structural).

Policy responses:

- There was no room for fiscal counter cyclical policy. Consolidation was delayed thanks to additional revenues from a Tax Reform in 2014, but this left large unfunded commitments that were supposed to be financed by the reform. Fiscal adjustment began in earnest in 2016 and will have to continue for several years.
- Monetary policy was very active, despite the change in tone in US Monetary Policy beginning with the Taper Tantrum in 2013.
- The size of the mining investment shock (4% of GDP spread over four years) could not be fully compensated by monetary policy alone, especially after inflation began to rise in reaction to sustained depreciation of the currency.

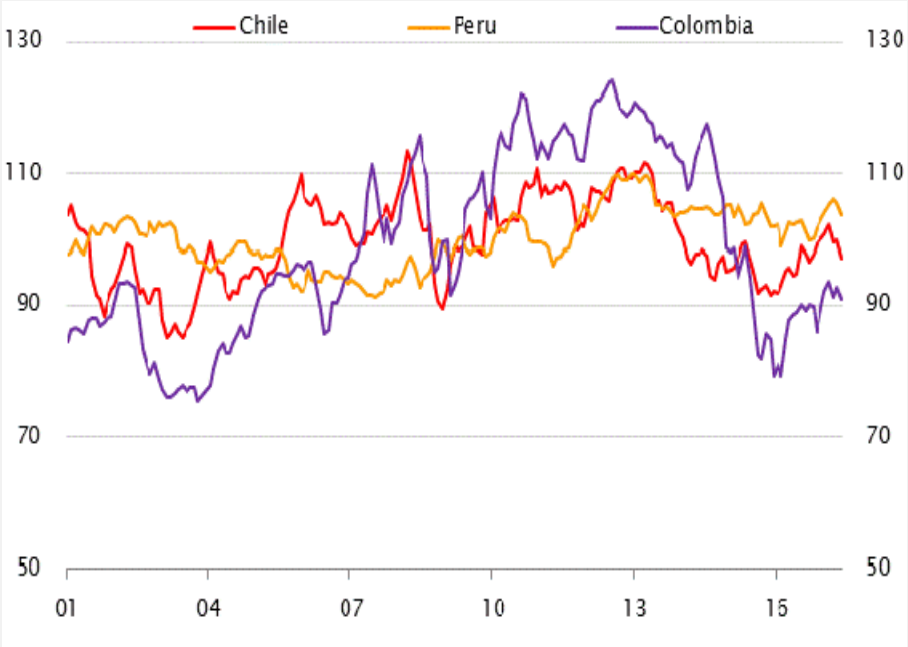
What we learned?: Monetary policy and FX flexibility work well together

Figure 18: Monetary Policy Rates in Chile and the U.S.



Source: Central Bank of Chile.

Figure 10. Real Effective Exchange rates selected countries in Latin America
(Indexes, 2001-2015=100)



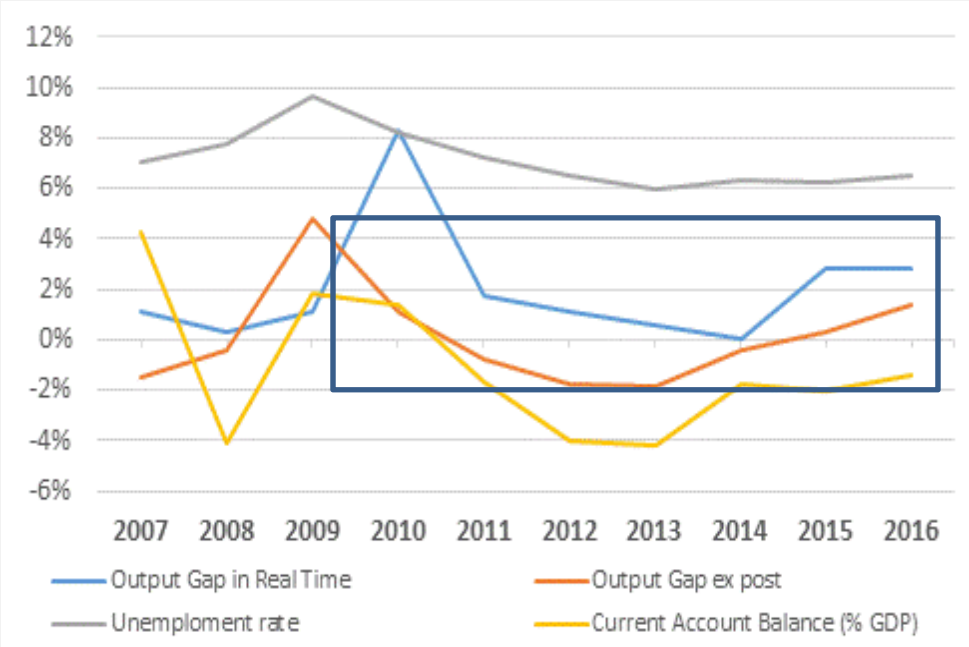
Sources: Central Banks of Chile, Colombia and Peru.

What we learned?: Structural Fiscal Rules work well for short-term shocks, but are not enough if they are sustained

- There are problems to identify the nature of the cycle in real time: copper prices tend to have low frequency cycles (4 years average, but this was about twice) and the Output Gap is very sensitive to new information to distinguish between cyclical and trend changes.
- During a sustained commodity price boom, costs rise. For a given (high) reference price of copper, profits and fiscal revenues from copper tend to fall.
- An investment boom in natural resources (mining) could be large and long lasting (time-to-build) enough to have an impact on the estimates of Potential Growth, with an impact on fiscal policy.
- Special care should be taken to legislate long-term fiscal expenses based on permanently higher rents form the natural resources.
- A fiscal rule to isolate fiscal expenses from cyclical fluctuations does not guarantee fiscal solvency in the event of a sustained shock. Independent monitoring of fiscal sustainability is critical.

What we learned?: Problems to identify the cyclical position of the economy in real time

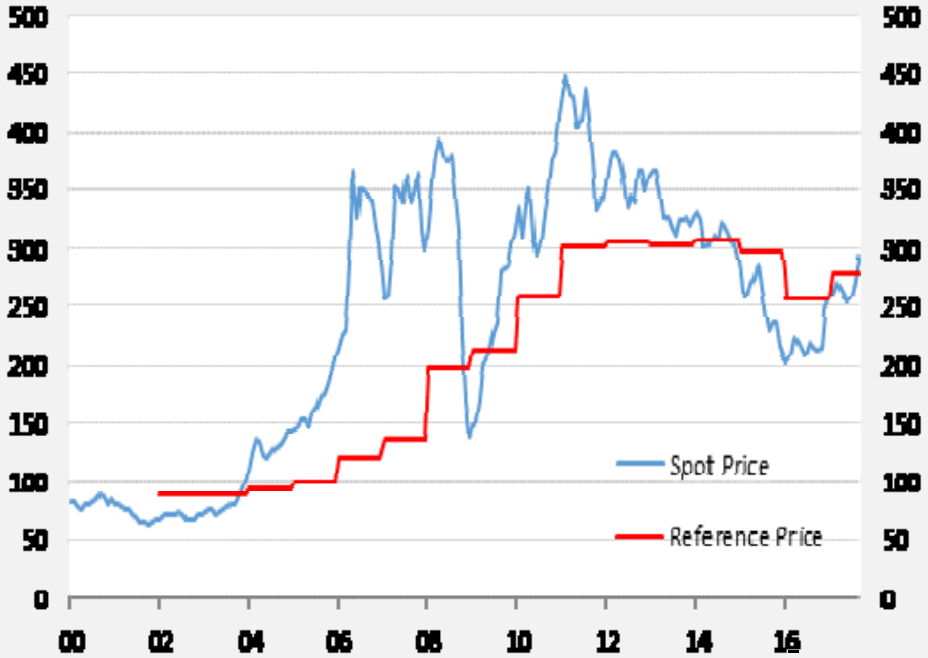
Figure 19. Measures of Economic Slack for the Chilean economy, 2007-16.



Source: Central Bank of Chile.

Figure 12: Spot and Reference Price of Copper

USD cents per pound



Sources: Central Bank of Chile and Dipres. *Public Finance Report,* 2016 and "*Evaluación de las Gestión Financiera del Sector Público en 2016 y actualización de proyecciones para 2017*", July 2017.

Final Remarks

- Fiscal rules designed to neutralize the impacts of transitory shocks in commodity prices might not work well when they are persistent, especially if they bring about an investment surge into the Natural Resources sector
- Monetary policy can work well in an environment of FX flexibility, but it has limited power to compensate for a persistent (real) investment shock in the natural resources sector
- Moving from an structural balance calculated on the basis of the Output Gap to one based on Potential GDP might help to provide more stable fiscal expenditure and it would make easier to evaluate compliance with the target
- In the case of copper revenues it would be better to focus the attention on costs and normal margin rates, instead of trying to project a very uncertain copper price
- Independent oversight by an independent committee seems very important to secure fiscal policy credibility and medium and long term sustainability

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Annex: Simulation of a sustained commodity price shock with slow learning

The exercise

- Using an extended version of the DSGE model of the Central Bank of Chile, we simulate the effects of a sustained increase in the price of copper (80% above trend for 8 years followed by a partial reversal to 40%) under perfect foresight (**baseline**) and the alternative in which agents learn slowly (about 4 years lag) about the true composition of the shock (**slow learning**)

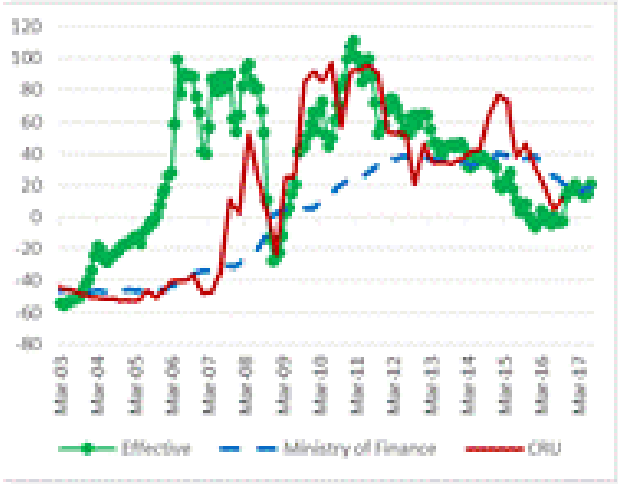
The model

- Standard Neo Keynesian DSGE, expanded to include a government sector that follows a fiscal rule such as the Chilean one, and also endogenous determination of mining production ad investment, with a long time-to-build process.

Annex: Simulation of a sustained commodity price shock with slow learning: Assumptions

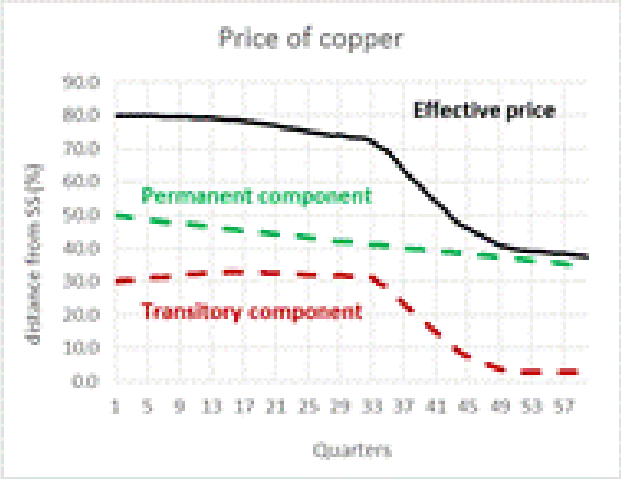
Figure 20: Copper Prices

A: Effective and Medium Term Estimates (deviation from the mean)



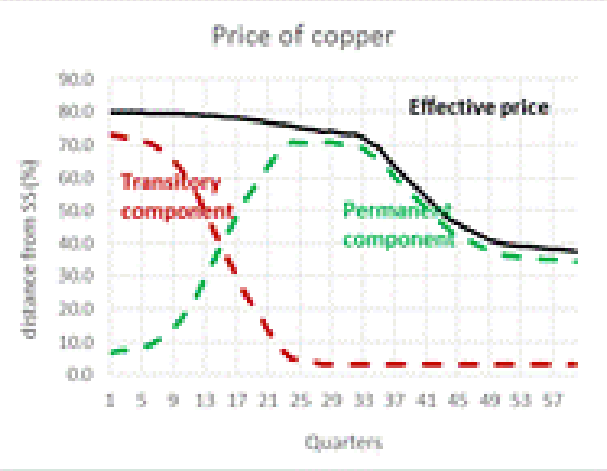
Source: CRU, Bloomberg, Dipres.

B: Baseline (Dev. from Steady State)



Source: authors' calculations.

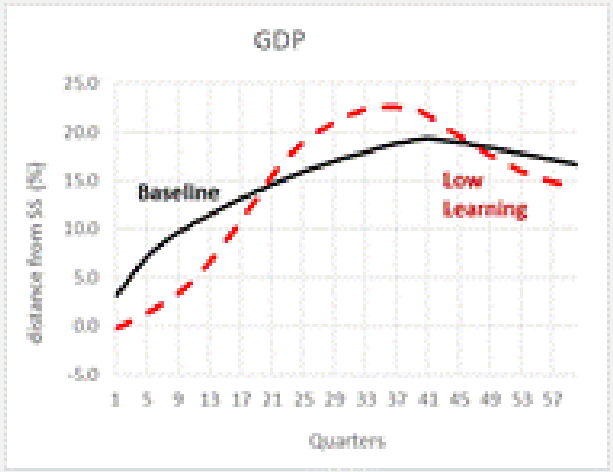
C: Slow-Learning (Dev. from Steady State)

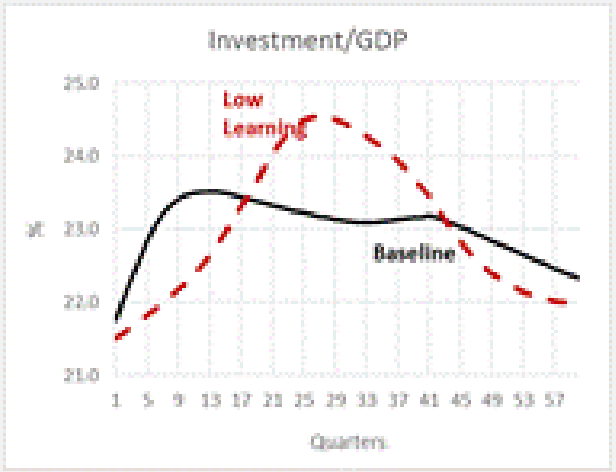


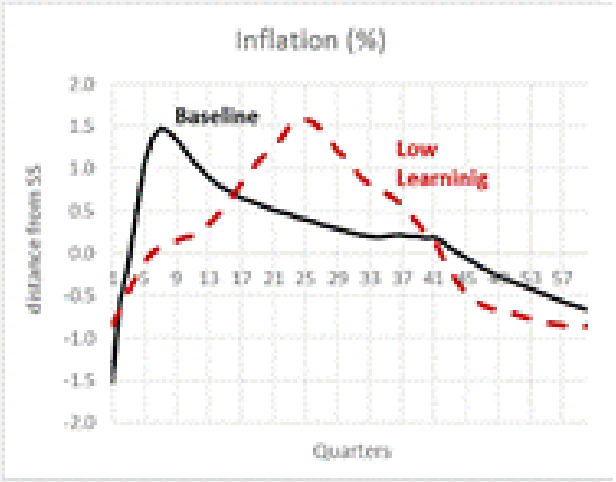
Source: authors' calculations.

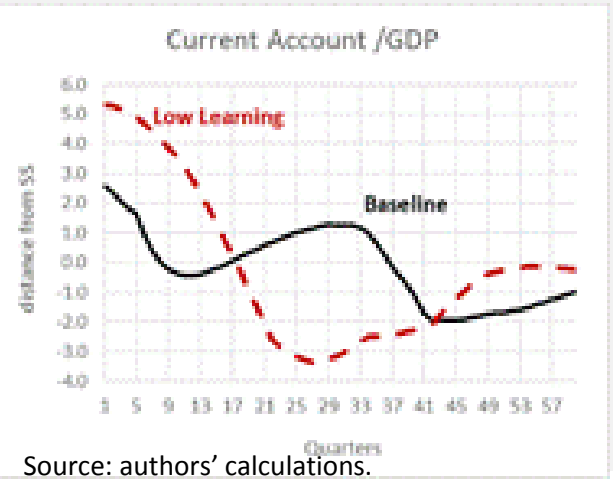
Annex: Simulation of a sustained commodity price shock with slow learning: Main Results

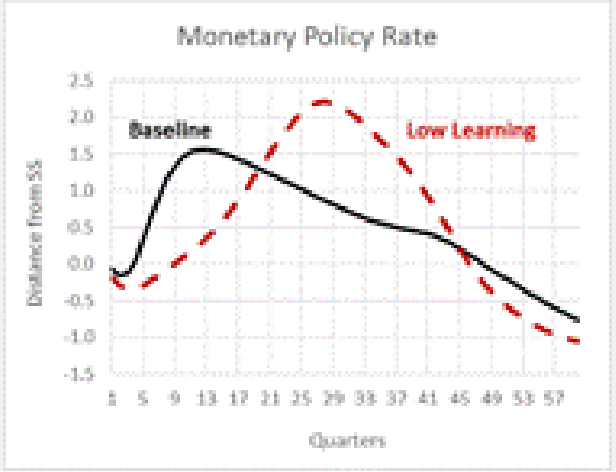
Comparison between Baseline and Slow – Learning Scenarios
(Percent deviations from steady state)

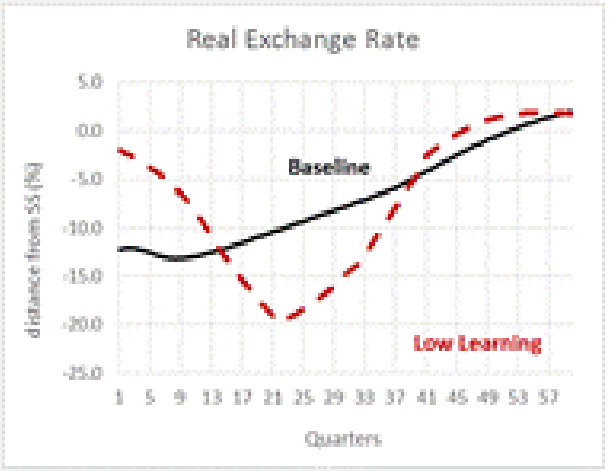












Source: authors' calculations.

Annex: Simulation of a sustained commodity price shock with slow learning

Main conclusions

- The slow-learning case implies slower growth and higher savings in the initial phase of the cycle, than in the baseline.
- However, after a while, agents expectations overshoot the long-term price of copper and aggregate demand, inflation and the current account deficit rise above the baseline levels.
- The equilibrium monetary policy rates follow the cycle. In the baseline it rises fast and early and in the slow-learning scenario there is a slow build-up to a higher peak, and then a gradual reduction.
- The fiscal results are conditional on the evolution of fiscal expenditures. To begin with, we assume full flexibility and compliance with the structural balance rule. In the slow-learning scenario initially there is a higher build-up of government assets, up to the point in which expectations overshoot the long-term price, when the situation is reversed. At the end, both recognize the true nature of the shock and converge to the target with the same reference price.
- One key extension is to assume fiscal expenditure rigidity in the face of lower perceptions of the long-term price of copper. We are working on it now.