

CIGLOB

CENTRO INTERNACIONAL DE
GLOBALIZACIÓN Y DESARROLLO

International Center for Globalization and Development

Documento de Trabajo
Working Paper

N°29

The Copper Sector, Fiscal Rules and Stabilization Funds in Chile: Scope and Limits

Andrés Solimano / Diego Calderón

September 2017

www.ciglob.org

Contact us / Contáctenos:
contact@ciglob.org

Santiago - Chile

Revised Version.

Prepared for the UNU-WIDER project on Extractive Industries and Economic Development

The Copper Sector, Fiscal Rules and Stabilization Funds in Chile: Scope and Limits

Andres Solimano (CIGLOB)
Diego Calderón G. (University of Chile)¹

November 4, 2016
Revisions: September 2017

Abstract

Historically, Chile has been an economy dominated by mineral and agro-industrial products and subject to frequent external shocks particularly in copper prices. Since the 1980s the authorities have developed various mechanisms to cope with these shocks and dampen their effects on the domestic business cycle. These mechanisms include a fiscal rule, an Economic and Social Stabilization Fund, (ESSF), a Pension Reserve Fund (PRF) and an (informal) “Defense Fund”. The first two Sovereign Wealth Funds are regulated by a Fiscal Responsibility Law and complemented by a flexible exchange rate regime and an autonomous Central Bank. This paper recognizes this macro framework has been associated (causality is another matter) with reasonably good macro outcomes. However, the paper highlights some trade-offs and questions not always recognized in evaluations of the Chilean case and cautions against a blind endorsement of macro rules as the cornerstone for good macro management. In general this framework entails more discretion than often portrayed and include: (i) Frequent revisions in the methodology that affects the fiscal rule and the level of the Structural Balance by the authorities thereby reducing its anchoring role on expectations and policy predictability; (ii) SWFs tend to have clear rules for accumulating resources at good times but no rules for using

¹ We would like to thank the useful comments and suggestions of Alan Roe made to an earlier version of this paper. Comments from Maximiliano Acevedo and Ciro Giraldez from the Chilean Ministry of Finance are appreciated. Please any communications can be directed to asolimano@ciglob.org, asolimano@gmail.com.

them at bad times (this particularly true for the ESSF that replaced the Copper Stabilization Fund) that depends completely on the discretionary judgment of the fiscal authority; (iii) A possible bias to over-accumulation of resources in SWFs without paying attention to the opportunity cost of over-investing in stabilization funds at the cost of less resources available for funding egalitarian social policy in a high-inequality country .

1. Introduction

The copper sector constitutes the main export product, the main source of fiscal revenues, foreign exchange and national income in the Chilean economy. Its price is affected by both changes in productive demand (chiefly in the construction sector and industry in copper-importing countries) and speculation in metals markets. Copper price volatility can have mayor macroeconomic consequences on the internal economy. Since the 1980s and more aggressively in the 2000s, Chile developed macroeconomic mechanisms to deal with this volatility.

After the nitrate cycle faded away in the 1930s, copper started to play a pivotal role but mines were owned and exploited by foreign corporations (mostly of US origin) under often generous tax policies and repatriation of dividends arrangements. In this context, “chilenization” (mixed public-private partnership) policies were developed in the 1960s to be followed by nationalization in 1971 (approved by the Chilean Congress with the unanimous support of all political parties) that gave the full responsibility of property and management of copper mines to the Chilean state. Those policies were initially maintained by the military regime after the coup of 1973 but then gradually reversed as the country embarked on a neoliberal economic model. As early as 1974 a decree-law (DL 600) to attract foreign investment was enacted that provided tax, repatriation and property protection for foreign corporations. This was followed in the 1980s by a mining code for foreign corporations that paved the way for a steady privatization of the large

scale copper production sector. In the 2000s the policy regime regarding mining established low royalties and moderate taxes to foreign direct investment along with generous leasing and concession agreements to private investors. However, the prevailing constitution, approved in 1980 and still ruling, maintained several provisos of the nationalization policies of 1971.

At macroeconomic level, the Chilean government created the copper stabilization fund in 1987. The copper fund accumulated resources when the current price was higher than a reference price and drew down funds accumulated in previous periods when the current price was below that reference price. This was followed by a fiscal rule (2001) and later by a law of fiscal responsibility in 2006 that created the Economic and Social Stabilization Fund (ESSF) that replaced the existing copper stabilization fund and created the Pension Reserve Fund (PRF). The ESSF is oriented to dampen the effects of changes in international copper prices and copper demand on domestic economic activity (output, investment, and employment), the balance of payments and the fiscal budget. As the revenues from the copper sector are a main source of fiscal revenues this would help ensure a more stable stream of revenues for the state and, in principle, avoid cycles of expansion and contraction in public expenditure.

The *fiscal rule* was to operate under the principle that “permanent” spending should follow “permanent” revenues (determining what is permanent in an uncertain and volatile world is not easy) and was expected to contain fiscal spending and isolate it from political and social pressures.

In addition to the ESSF and PRF there is an opaque fund managed by the Ministry of Defense and the Chilean Armed Forces. Since 1976, a “secret” copper law introduced by the military regime of General Augusto Pinochet sanctioned that 10 percent of *gross annual revenues* of CODELCO (the copper state-owned company) must be transferred to

this fund to finance the acquisition of military equipment. This law is still in operation and prevents congressional accountability of these transfers.

The paper is organized in five sections including this introduction. Section 2, provides a brief historical background of the evolution of the copper sector since the 1930s to the present and focuses on the relation between GDP and investment cycles and copper price cycles, considering also policy and other external shocks, in the last four to five decades. Section 3 documents the evolving institutional regime (affecting the property of mines, taxation and concession schemes) governing the copper sector since the 1950s until the present comprising dominant foreign-ownership, “chilenization”, nationalization and then gradual de-facto privatization. Section 4 shows the interplay between fiscal shocks, fiscal rules and stabilization funds (sovereign wealth funds) and provides additional detail on how the funds were created, their rules of operation and their expected benefits and management costs. Section 5 evaluates the macro framework in place in Chile to cope with external cycles highlighting also some open questions (and loose ends) regarding the “optimal” level of resource accumulation of these funds in an economy of high inequality and pending social demands and the prevailing discretion governing the use of the funds at bad times. It also touches issues of the level of taxation in mining, current ownership/leasing arrangements and the primacy given to defense spending in the allocation of part of CODELCO’s gross revenues.

2. Brief historical background of a mineral exporting economy and cycles related to the copper sector.

Historically, Chile has been reliant on natural resources such as nitrate, copper, coal, gold, wheat and other commodities for its development process. Two long cycles of commodity dependence can be distinguished: the *nitrate commodity cycle* of boom and decline that started around 1880 until its eventual decay in the early 1930s and a *copper cycle* that started in the 1930s until today. In the 1900-20 period nitrate exports accounted for 65-80 percent of total exports, which, in turn, represented nearly 40 percent of GDP (Cariola and

Sunkel, 1982; Meller 2016). The government imposed an export duty on nitrate that financed nearly 50 percent of total public expenditure. Eventually, the boom of Chilean natural nitrate came to an end when Germany managed to develop synthetic nitrate at a lower cost; as a consequence, the Chilean production of nitrate declined by nearly 75 percent between 1928 and 1934 (Diaz et al., 2016) prompting an economic and social crisis in the country. Since the 1930s copper started to replace nitrate as the main export commodity, mainly directed to the American market.

Due to the adverse effects of the Great Depression in core economies that hit Chile very hard in the first half of the 1930s, the country switched from a commodity export-oriented growth pattern into an import-substitution growth and industrialization strategy. In the period 1950-1970, the importance of exports in GDP declined sharply and fluctuated between 7 to 9 percent. Copper income at that time represented 55 to 65 percent of exports and 15-30 percent of total fiscal revenues.²

2.1 The copper sector, policy shocks and macroeconomic cycles

In macroeconomic terms we observe a broad positive correlation between growth and investment cycles on the one hand and the evolution of real copper prices on the other, perhaps acting with some lags (see figure 1). The dominant pattern is that years of slow GDP expansion, including episodes of negative growth (recessions and depressions) have, often, followed a reduction in real copper prices. These cycles also have been accompanied by adjustments in other variables such as investment, employment and the

² In the last the last 55 years, reflecting Chile's effort at diversifying its export base from, the share of copper in total exports declined from near 70 percent in the 1960s to 46 percent in 2000-2009, followed by a small increase again by 2010-2014 when the share moved slightly above the 50 percent mark (see table 1). However, as a proportion of GDP, copper exports doubled from 8.1 percent in 1960-69 to 16.4 percent in 2010-2014.

real exchange rate.³ Due to the importance of the copper sector and the country's trade and financial openness, Chile has developed a set of fiscal rules and sovereign wealth funds to deal, with varying degrees of success, with external shocks, especially volatility of copper prices.⁴

Table 1.

Copper exports in Chile. Annual average, 1960-2014
(US millions, % of Total Exports and % of GDP)

	1960- 1969	1970- 1979	1980- 1989	1990- 1999	2000- 2009	2010- 2014	1960- 2014
US millions (2014)	3,582	5,017	4,978	7,695	23,316	42,754	11,994
% of Total Exports	68.9%	63.9%	45.8%	37.8%	45.7%	53.9%	52.5%
% GDP	8.1%	9.4%	9.4%	8.3%	14.9%	16.4%	10.6%

Source: Own elaboration based on DIPRES (2016).

A well established regularity is that investment is highly pro-cyclical moving closely with, but adjusting more than GDP, particularly in recession years (see Figure 2). The two main recessions/depressions in the 1970- 2015 period took place in 1975 (associated with anti-inflationary shock policies and a decline in the price of copper) and in 1982-83 (led by a domestic financial crises following unregulated banking deregulation and a currency crisis)⁵. In these two short, but deep, 'depressions' GDP declined sharply, on average, between 12 and 16 percent, and investment contracted further in the range 20 - 35

³ variations in the price of copper are closely related to external economic activity (chiefly in the construction sector and industry) and also to financial speculation in commodities - in what looks like a mean-reversing process.

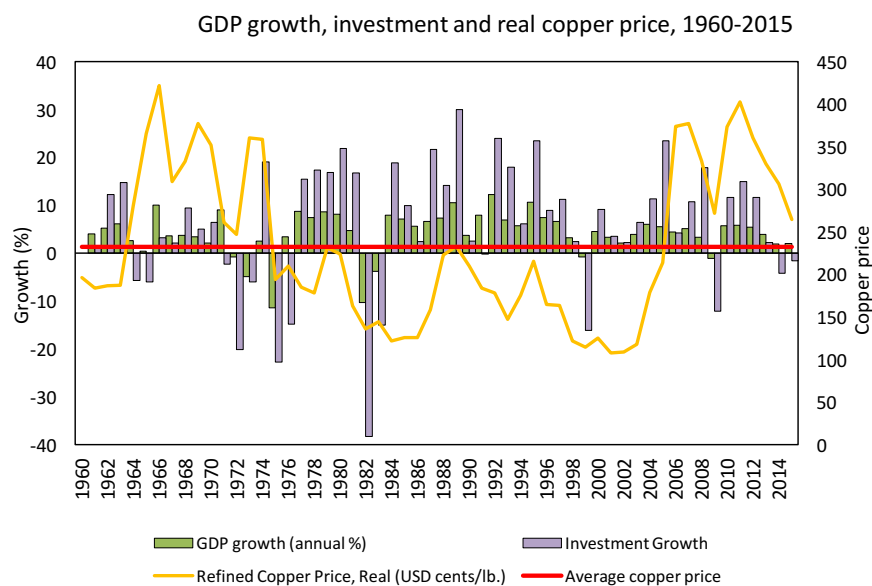
⁴ Several objective evaluations of these rules have been positive albeit with some recommendations regarding forecast methodology and have marked these policies as a successful example of natural resources boom management from a *macroeconomic perspective* (Frankel, 2011; Céspedes et al., 2014). However, as we argue below these evaluations tends to overlook the opportunity cost involved in the accumulation of resources in stabilization funds and neglect the lack of rules governing the use of the funds. Moreover, in terms of its output composition, the Chilean economy is still heavily concentrated in mining and services with a reduced share of the manufacturing sector in GDP suggesting tendencies to de-industrialization (Solimano and Schaper, 2015).

⁵ See Solimano (2012).

percent. Then, there were two other years of negative growth in 1999 (a follow-up of the effects of the Asian and Russian crises) and 2009 (following the global financial crises) in which GDP contracted between -1.2 and -1.5 percent each year and investment declined between 10 and 15 percent.⁶ As could be expected, in these four episodes of recession and depression the cut in investment was several times greater than the decline in GDP. In turn, the duration of the recoveries/expansion after these recessions/depressions were of variable magnitude, the longer being the period 1984-2008 after the depression of 1982-83 and before the recession of 2009.

Figure 1.

⁶ The mining industry has been, historically, the sector that contributes the most to total investment given its capital intensity and the lumpy nature of investment. In the period 2008-2014, mining investments represented nearly a quarter of total gross fixed capital formation. Mining accounted for roughly 30 percent of total FDI from 1974 and 2015 equivalent to US\$ 37,700 million.



Deflator: U.S. Producer Price Index (PPI, all Commodities)

Source: Own elaboration based on WDI, Central Bank of Chile, and Cochilco.

3. The evolving institutional framework of the mining sector: the cycle of foreign – ownership, nationalization and de-facto privatization

The institutional framework ruling the copper sector in Chile has been, historically, affected by the dominant role played by foreign corporations (mainly American) in the mining sector. Arrangements affecting prices, taxes, royalties and other factors did not always benefit the Chilean nation. In fact, following World War II and at the start of the Korean War (1950-53), the American government decided, unilaterally, to fix the copper price (at 24.5 c/lb), which was a level less than a half the market price (54.5 c/lb). As the U.S was the main buyer of Chilean copper this led to losses of export earnings and was a major concern for the Chilean authorities (Millán, 2006). A commission was sent to Washington D.C to claim retribution for this decision and a “Washington agreement” was signed in 1951. This arrangement allowed the Chilean State, through the Central Bank, to

dispose of 20 percent of copper production by buying it from American companies in Chile at the fixed price and then selling it at its market price to other countries.⁷ This unfavorable agreement didn't appease Chilean demands and in 1955 the "New Deal" law was established in order to promote copper production and to regulate the tax structure of mining industry. The shortcomings of this agreement in the following years paved the way for the "Chilenización del Cobre" adopted under the Christian Democrat President Eduardo Frei Montalva (1964-70). The Chilenization law #16.425 of January of 1966, created Copper public-private joint-companies in which the Chilean State would buy 51 percent of the property of the copper mines in a period of 15 years. This was the first serious, albeit cautious, attempt to recover Chile's natural resources base for national development.

In 1970, the political winds had changed in Chile and a socialist President, Salvador Allende, was elected by popular vote (despite active Nixon-Kissinger covert destabilization efforts, now documented by official US Congress records). Once in government, Allende sent to congress a law to nationalize copper mines. In July of 1971, the country's Constitution was modified with the unanimous support of representatives of all political parties from conservatives to communists and copper mines were nationalized.⁸

On September 11, 1973 the Allende government was ousted by a bloody military coup led by General Augusto Pinochet (appointed as chief commander of the army by Allende in August 1973). Once in power, the military junta started talks with US copper companies (Anaconda and Kennecott) to rapidly compensate American corporations affected by nationalization approved by the previous parliament (that had been closed by the army

⁷ Copper exports were allowed in those years of the cold war only to countries that were not considered "enemies of democracy" as defined by the US government.

⁸ A technical commission of the Chilean government made an assessment that accumulated earnings of foreign mining companies since their creation were "excessive" and the Chilean government refused American demands for further compensation. This action reinforced Nixon's determination to destabilize the Allende's government.

after the military coup). Then, friendly policy towards foreign investment in the copper sector and other activities started to develop although the nationalization of copper mines was not officially reversed by the military government (Solimano, 2012). As mentioned before, in 1976, the “Corporación Nacional del Cobre de Chile” (CODELCO) was established and given the mission of managing the copper companies that were nationalized in the Allende’s period. Contrary to what happened to other public companies, CODELCO was not included in the several massive privatization programs undertaken during Pinochet’s dictatorship. That same year, a highly controversial secret law dating from 1958 –the “Copper Restricted Law”– directed to fund the acquisition of military equipment and weapons out of copper sector profits was modified. As noted before, the new copper law (maintaining its “secret” status) stated *that 10 percent of gross revenues of CODELCO* were to be directed to finance military purchases by the Chilean armed forces *without* the standard overseeing (formal accountability) by parliament and the general comptroller of the country. A minimum annual transfer of US\$ 90 million was set at that time. This copper law at the time of this writing is still in force. In 2015 the total annual defense budget of Chile according to SIPRI (Swedish International Peace Research Institute) is over US\$ 5 billion.⁹

It is important to note that, due to its corporate governance and tax regime, CODELCO – as with all the public companies- is subject to an extra 40 percent tax over profits which represent an extra extraction of its net revenues besides the resources transferred to the Armed Forces through the secret copper law. Currently, with low copper prices, this framework has turned CODELCO into a company with a potentially vulnerable financial situation that is affecting its ability to undertake its investment planning in future years. Despite its huge profits, CODELCO’s debt grew by 247 percent between 2004 and 2015 as

⁹ Currently, several previous commanders in chief of the Army and high-range generals are under investigation accused of illicit and corrupt management practices of funds coming from the secret copper law.

it transferred to the State treasury an accumulated amount of US\$ 56,000 million in the same period (the highest financial transfer in CODELCO's history).

Box 1. Nationalization and Privatization in the Copper sector

The legal framework governing the copper/mining sector contains somewhat conflicting provisos. On the one hand, the regulations of the 1971 nationalization were incorporated in the constitution of 1980 (approved during the Pinochet regime). On the other hand, very corporate –friendly supplementary legislation was passed in 1982-83 known as “the Organic Law of Mining Concessions (1982) and the Mining Code (1983)” in order to promote overseas investment in mining. The contradictory nature of this overlapping of constitutional provisions and subsequent laws is apparent if we read article 24 of the ruling Constitution stating that “the State has absolute, exclusive, inalienable and imprescriptible domain over all mines and resources underneath Chilean soil” (reflecting the flavor of 1971 nationalization). However, at the same time the 1980 constitution gives priority to private property rights (over social rights) and *mining concessions* (leasing arrangements granted by the state) can be extended indefinitely without limit with the holders of leasing rights (concessioners) having the priority to renew them - even over claims of the State - by paying very small fees (less than US\$ 10/ hectare per year according to specificities of the surface). In addition, if the Chilean state were to nationalize private mining companies (either national or foreign), it would have to compensate private companies with a monetary sum equal to the present discounted value of the estimated future cash flows of the project. In practice the pro-private companies mining code has dominated and the copper sector has been progressively de-nationalized/privatized with the “property” of mines concentrating increasingly in private companies that enjoy an incumbent status. As they have priority to renew the leasing

arrangements (at an extremely low cost) this has also discouraged the entry of new competitors.¹⁰

The history of the mining sector legislation since the military regime included, as indicated, the Decree-Law 600 established in 1974, and ruling today, that allows unlimited repatriation of profits by foreign investors and the option of an *invariant tax structure* to investments made under this regulation. Tax invariability and loopholes have made Chile's one of the most attractive mining destinations for foreign investors. In response, FDI in mining started to pick-up a few years after the return to democracy (rather than during the period of authoritarian rule itself) and the post-Pinochet governments have maintained, on the whole, the mining legislation enacted by the General.¹¹

In 2003, the Chilean Congress appointed a special commission to study the possibility of introducing new private-sector mining taxation arrangements in response to a series of allegations of persistent practices of tax avoidance and after a decade of massive foreign investment into the mining sector.¹² This Congressional special commission identified various legal mechanisms used by private corporations to declare negative profits such as transfer pricing, fraudulent forward manipulations, accelerated depreciation and debt interest payments. After extended political discussion and lobbying by the mining companies, in 2005, the Specific Mining Tax (SMT) --that taxed profits but not the value of sales or physical production as is the traditional concept of "Royalty"-- was passed into a

¹⁰ For more detail on the effects of Mining Code, see Cochilco (2013).

¹¹ Accounting schemes (non-penalized) have been used for purposes of tax avoidance. Very favorable conditions for foreign investors embedded in the DL 600 "Is too good to be true, and the companies know it" said Radomiro Tomic --a copper expert, former Chilean ambassador to the United States and prominent political leader that happened to be the Christian Democratic party's presidential candidate in 1970 in the elections running against Allende and Alessandri - to the Washington Post in 1982 to reflect the business climate of those years (Diehl, 1982).

¹² According to former Senator Jorge Lavandero (former head of the Mining Commission in Congress), only 2 of 47 private copper companies paid taxes to the government between 1995 and 2002 (Lavandero, 2003).

law.¹³ Unfortunately, this “royalty” (SMT) contributed only about 1 percent of total fiscal revenues and 5 percent of total mining taxes between 2006 and 2015 (Table 2). The fact that the royalty is levied on profits rather than on the value of production along with practices of diminishing profits may account for this meagre revenue.

4. A macroeconomic perspective: orthodoxy, fiscal rule and stabilization funds

Chile’s economic performance in recent decades is often presented as a case of sound macroeconomic management by international financial institutions such as the World Bank and the IMF and the international financial community. The policies in place provide an almost textbook example of macroeconomic orthodoxy combining inflation-targeting, a fiscal rule, a free floating exchange rate, and an open capital account. The Fiscal Responsibility Law of 2006 is supported by the fiscal rule and two formal sovereign wealth funds (to manage the budget surplus generated at the time of copper price booms): the Economic and Social Stabilization Fund (ESSF) that has accumulated, by mid-2016, near US\$ 16 billion and the Pension Reserve Fund (PRF), running a surplus of US\$ 8.3 billion.¹⁴ A third, relatively hidden fund is constituted by the surplus accumulated by the (“secret”) copper law aimed to benefit the armed forces that has accumulated near US\$ 5 billion. Thus, over US\$ 30 billion dollars are held in the three stabilization funds, not a minor amount for a US\$ 300 billion GDP economy.

The literature evaluating these arrangements suggests that they have succeeded in reducing economic volatility stemming from terms of trade shocks and other internal and external shocks affecting the macro economy. For example, Franken et al. (2006) show that the reduction in GDP volatility between 1991 and 2003 was associated with a

¹³ Specifically, the SMT is not a Royalty because it taxes profits rather than revenues. Therefore, there is a double incentive to underestimate revenues and to overestimate costs.

¹⁴ The ESSF is an amended and extended legal formalization of the Copper Revenue Compensation Fund (CRCF) established in 1987. The PRF is a special fund dedicated exclusively to guarantee the sustainability of State funded pension payments.

reduction in the volatility of the monetary and fiscal stance. Larraín and Parrado (2008) find that roughly 60 percent of GDP volatility reduction is related to the fiscal rule and the prevailing flexible exchange rate regime. Furthermore, De Gregorio and Labbé (2011) show that the Chilean economy has become increasingly resilient to copper price shocks since 1985, and especially since the 2000s due to its macroeconomic framework. Céspedes et al. (2014) show that the policy mix adopted by Chile allowed a strong *countercyclical* fiscal response to the global financial crisis of 2008-09 (the counter-cyclical fiscal stance was not pursued after the decline in copper prices since 2013).

An early attempt to manage the impact of the volatility in copper prices was the “Copper Revenue Compensation Fund” (CRCF) created in 1987. This fund aimed at preventing the occurrence of *fiscally-induced* economic cycles at the time of upward movements in international copper prices (e.g. governments have a propensity to pro-cyclically increase public spending at times of enhanced fiscal revenues). The CRCF was set to accumulate resources (savings) when the copper price was higher than a long term reference price (set by the fiscal authorities); in turn, accumulated resources could be spent when the copper price was lower than the reference price. According to the Chilean budget office (DIPRES, 2016), the CRCF was successful in managing price booms by reducing external debt and unsustainable government spending. The resources of the CRCF were used after the Asian crisis (1998-2003) and before that in 1993 and 1994.

Despite a prudent fiscal policy during the 1990s a more sophisticated framework was later adopted to tie the hands of fiscal authorities. In 2001, the administration of President Ricardo Lagos, created a “fiscal rule” that implied the calculation of the “Structural Balance (SB)”. This was intended to operate as a self-imposed policy of fiscal restraint. The idea behind the structural fiscal rule is simple but not without problems of implementation: fiscal spending should follow long run (*permanent*) values of the price of copper, GDP growth and other key parameters affecting the budget. However, determining what is “permanent” can be tricky, particularly in the case of copper prices (a variable with a strong random component) and nor is “potential” GDP growth a simple

concept to define and forecast.¹⁵ It is apparent that a main role of the fiscal rule is of a political-economy nature: it provides a (“scientific”) disciplinary device, supported by the wisdom of economic experts and aided by the principles of inter-temporal macroeconomic theory, for governments to contain social and political demands for higher public spending, particularly in a very inegalitarian society as Chile.

The Fiscal Responsibility Act was approved under the first administration of President Michelle Bachelet in 2006. The SB rule improved its methodology of income measurement and in 2011, under the administration of President Sebastián Piñera, a second generation methodology was applied, giving rise to the “Cyclically-Adjusted (fiscal) Balance”, CAB, (DIPRES, 2011). Again, an Advisory Fiscal Council was convened in 2013 to monitor the operation of the new rule.

In Figure 2, we can observe the evolution of the structural balance rule (based on the fiscal balance evaluated at the estimated long run values of copper prices and GDP) over the business cycle. We can observe, (as expected), that the evolution of the structural balance is smoother than that of the current (effective) balance. The changes (deterioration) in the current (effective) balance were significant during the Asian Financial Crisis that hit in 1997 (at that time there was only the CRCF) and also during the global crisis of 2008. In 2009 an aggressive countercyclical fiscal expansion was adopted by the fiscal authorities.¹⁶ Between 1990 and 2008, there had been, on average, a *surplus* in the effective fiscal balance in Chile of 1.9 percent of GDP. However, by contrast in 2009 the budget ran an effective *deficit* of 4.4 percentage points of GDP as a consequence of the cyclical decline in revenues and the effect of a large fiscal expansion.

It can be argued that the fiscal rule prevented an unsustainable increase in public expenditure in the period of the boom of copper price through 2007, and before the

¹⁵ Expert committees were appointed and asked to determine the permanent values of key parameters to be used by fiscal authorities

¹⁶ It is worth noting that the IMF at that time was recommending countries with fiscal space, to adopt expansionary fiscal policies

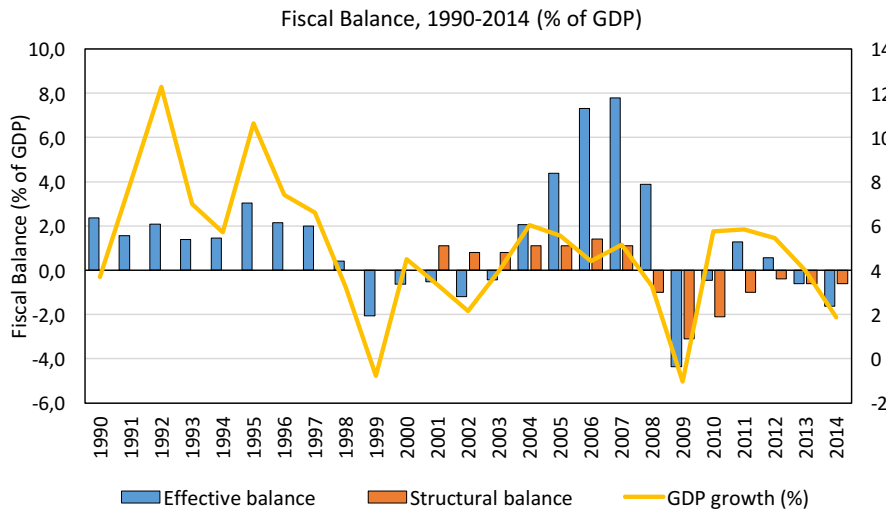
Comentado [a1]: Moved to footnote

global turbulence of 2008-09. In fact, between 2003 and 2007, when the copper price increased by 220 percent in real terms, the *structural* fiscal balance averaged 1.1 percent of GDP while the *effective surplus* was 4.2 percent of GDP in the same period. This means, that around 3 percentage points of GDP were *saved* by the Chilean state in the sovereign wealth funds during 2003 and 2007.¹⁷

As mentioned previously, after the global financial crisis, a combination of *countercyclical fiscal policy and expansive monetary policy* was adopted in Chile. According to Céspedes et al. (2014) close to US \$ 4 billion from the ESSF (2.8 percent of GDP) were assigned to the economic recovery in January of 2009 (later during that same year more money was spent) with several measures driven by the Central Bank such as stopping the accumulation of reserves, easing collateral requirement of repo operations, and temporarily loosening bank reserves rules. As we can see in Figure 2, the structural balance has remained consistently negative since then.

Figure 2.

¹⁷ Between 2003 and 2007 average GDP growth was 5 percent, (average GDP growth declined to 3.4 percent in the period 2008-2015).



Source: Own elaboration based on DIPRES (2015b)

The structural fiscal balance rule allows government spending expansions only when there is an increase in “structural incomes” driven by long term copper prices and potential GDP growth (see Box 2 and table 4). If the target for the structural budget is set in 1 percent of GDP, this means that expenditure for the next year will be 1 percent of GDP lower than structural income. To obtain structural estimates of potential GDP and long run copper prices members of expert teams provide their estimates to the Ministry of Finance. When the effective balance is larger than the structural balance, the surplus is saved in the ESSF. When the effective balance is smaller than the structural balance (SB), the deficit is covered with funds from the ESSF. However, the exact value set for the SB in the fiscal rule is still discretionary and largely depends on the appraisal made by the Ministry of Finance of relevant macroeconomic conditions. The first *surplus* target for the SB was set by the authorities at 1 percent of GDP during the period 2001-2007. Three arguments to choose this number were given at that time: i) the public sector was a net debtor (11 percent of GDP), ii) there were a potential increases in future fiscal liabilities related with pension guarantees, infrastructure investment needs and potential borrowing constraints, and iii)

it was decided that the Central Bank needed to be re-capitalized.¹⁸ Because of progress in funds accumulation during the previous period, the *surplus* target was diminished to 0.5 percent of GDP for 2008 and again to 0 percent in January 2009 to provide fiscal space for a fiscal expansion to counteract the effects of the global financial crisis. This value has been maintained since then.¹⁹

In February 2010 a major earthquake followed by a tsunami struck the center-south of Chile, causing hundreds of deaths and major physical destruction of housing and infrastructure. Reconstruction became the first policy priority of the nation, and public expenditure grew by 5.5 percent in real terms in 2010. The Piñera administration nonetheless committed to reduce the structural deficit, and a negative 0.6 percent of GDP was achieved by the end of his government in 2014. Since then, the authorities have expressed their intention to return to structural surpluses but predictions are that this may not be achieved before 2020 due to the expected lower price of copper and slower GDP growth.

Box 2. Fiscal Sensitivity to Changes in Copper Prices and Copper Production

Chile's fiscal position is strongly affected by changes in both the copper price and copper production. Small changes in relevant variables have a significant impact on effective fiscal incomes. However, the use of a medium term reference price prevents the effects of cyclical shock in structural fiscal incomes. The budget office (DIPRES's) simulations show that a change of one cent (US \$) in the copper price reduces fiscal revenues by US\$ 37.5 million. The reference price is useful to deal with uncertain global conditions, but structural fiscal incomes depend also on internal copper production. A reduction of one percent in copper production of CODELCO has an impact of US\$ 17 million on structural

¹⁸ Because of the crisis of 1982-1983, one of the most severe in Chile, several banks went to bankruptcy and government had to bailout Banks with a cumulative fiscal cost equivalent to approximately 35-40% of GDP.

¹⁹ The structural balance achieved -3.1% of GDP (deficit) in 2009 and the effective balance was -4.4% of GDP (deficit).

fiscal incomes. The same change in private mining production can reduce fiscal incomes by US\$ 34 million. Production it is not only affected by international demand through price changes, but also by local conditions such as rising energy costs, water availability, the decreasing ore grade of minerals, and increasing social and environmental issues as consequence of natural resources activities (see table 2).

Table 2

Parametric changes in relevant variable and effects on effective and structural fiscal incomes by sector, 2014

Variable	Unit of change	Effective income		Structural income	
		US\$ MM	% of effective income	US\$ MM	% of structural income
CODELCO					
Copper price (CODELCO)	1 cent (US\$)	-36,1	-1,5%	-0,1	0,0%
Copper production	1% change	-17,0	-0,7%	-21,7	-0,7%
Nominal exchange rate	1 peso (CLP\$)	-4,2	-0,2%	-5,7	-0,2%
Production cost per unit	1 cent (US\$)	-36,1	-1,5%	-36,1	-1,1%
Reference copper price	1 cent (US\$)	0,0	0,0%	-36,0	-1,1%
GMP-10					
Copper price (BML)	1 cent (US\$)	-11,4	-0,5%	0,3	0,0%
Copper production	1% change	-34,3	-1,4%	-33,5	-1,5%
Nominal exchange rate	1 peso (CLP\$)	-4,3	-0,2%	-4,5	-0,2%
Production cost per unit	1 cent (US\$)	-5,1	-0,2%	-5,1	-0,2%
Reference copper price	1 cent (US\$)	0,0	0,0%	-11,8	-0,5%

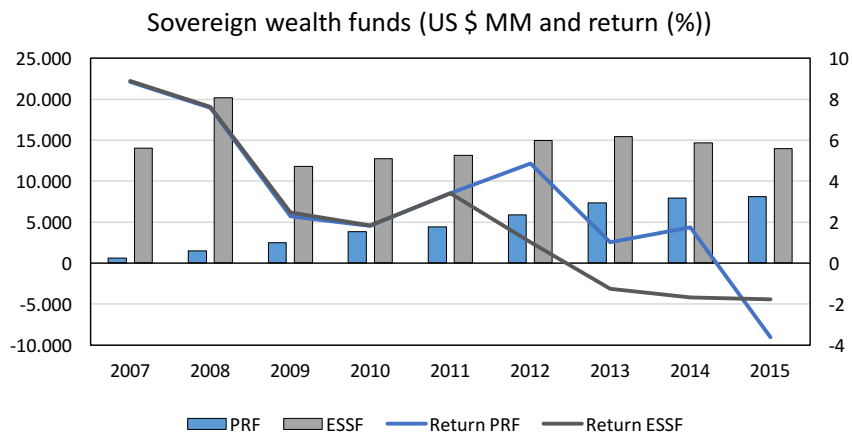
Source: Own elaboration based on DIPRES (2016)

4.2 Asset management of Sovereign wealth funds

Because of the copper price boom of 2002-2007, the ESSF and PRF both increased their savings in that period although the government later drew near US\$ 9 billion from the ESSF throughout 2009 to finance the fiscal expansion of that year. Figure 3 presents the accumulation pattern of ESSF and PRF and also the average annual rate of return of each fund. In fact, we can observe that despite its good profitability before the global financial crisis, negative results have been realized in the more recent years, mainly in the ESSF.

Overall, the total return since 2007 has been in line with a fixed income portfolio with a nominal rate of return of 2.28 percent for the FRP and 3.14 percent for the ESSF.²⁰

Figure 3.



Source: Own elaboration based on DIPRES (2015b).

According to the Fiscal Responsibility Law, the Ministry of Finance is responsible for both funds and is assisted by a Financial Committee of experts to define the investment policy and structure of the funds.²¹ In turn, the Central Bank in its role of fiscal agent, is responsible for materializing the investment guidelines defined by the Ministry of Finance and choosing the actual asset allocation and the strategic composition of the funds (Box 3).²²

²⁰ Rate of return calculated based on Time Weighted Rate of Return (TWR) methodology by the Ministry of Finance.

²¹ Decisions and recommendations made by the Financial Committee are not mandatory for the Ministry of Finance. The President of the committee is chosen by the fiscal authority. The committee also reports to Congress about asset management of SWFs.

²² Referential buyers, benchmarks, limits and investment constraints are also defined, and for more sophisticated investments, such as equities. International administrators such as BlackRock and Mellon

The resources of the ESSF can be used at any time to complement current fiscal incomes in periods of fiscal deficits. They can also be used for the amortization of public debt and to capitalize the PRF by a discretionary decision of the Minister of Finance.

Box 3. Transfers to the Pension Reserve Fund (PRF) and the Central Bank

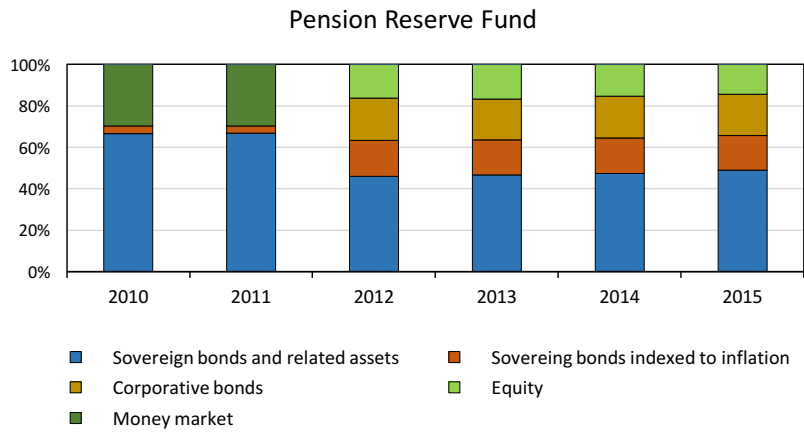
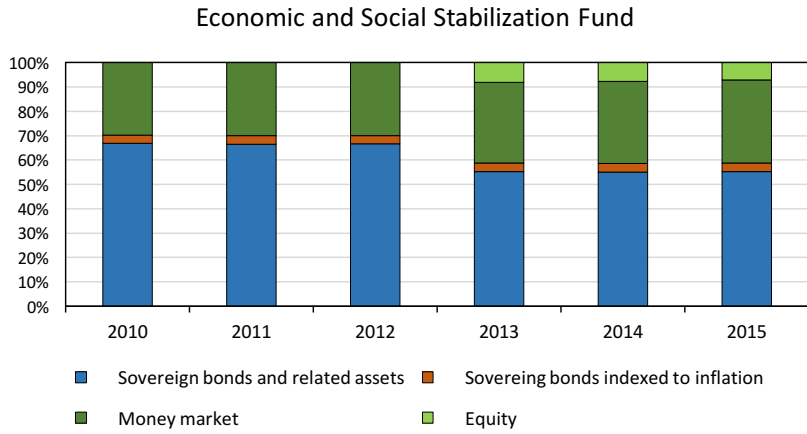
The Fiscal Responsibility Law establishes a minimum annual transfer to the PRF equivalent to 0.2 percent of previous year's GDP. If the overall fiscal surplus exceeds this number, the transfer may not exceed a maximum of 0.5 percent of GDP. In addition, government is authorized to recapitalize the Central Bank (that still holds debt issued at the time of the banking crises of 1982-83) for an amount equivalent to the difference between government contributions to the PRF and the fiscal surplus with an upper limit of 0.5 percent of GDP (in 2006, 2007, and 2008, the recapitalization of the Central Bank was equivalent to 0.5 of 1 percent of GDP). If there is a surplus after payment into the PRF and capitalization of the CBC, resources must be deposited at the ESSF (repayments of public debt and advanced payments into the ESSF during the previous year can be subtracted from this contribution).

The investment policy of the funds seeks to maximize their market value subject to a certain level of risk exposure. Portfolio composition is tailored to maintain high liquidity, low credit risk and low volatility investments in order to accommodate future fiscal deficits and avoid losses for the funds. As we can see in Figure 4, the current investment policy of the ESSF and the PRF relies mainly on bonds and fixed income instruments (which are in reserve currencies such as the swiss franc, the yen and the euro; the funds are denominated in US dollars).²³

Capital Management perform various duties for a fee and the international custody of the Funds' resources relies on J.P Morgan.

²³ Following the recommendation of the Financial Committee, since 2012 in the case of the PRF and 2013 for ESSF, equities have been part of both portfolios in order to increase profitability of funds but maintaining a significant part of the funds in sovereign bonds.

Figure 4.



Source: Own elaboration based on CBC data.

Box 4. The costs of managing the ESSF and PRF

There are certain direct costs related to the management of stabilization and reserve funds. The Central Bank, acting as a fiscal agent, sub-contracts the administration of the funds' investment to international finance management companies. Table 3 shows that in 2015, total costs (fees and administration costs) in the ESSF rose to US\$ 2.9 million meanwhile total costs of the PRF rose to US\$ 4.5 million. However, part of these costs are covered by profits of "security lending" (US\$ 2.5 and US\$ 0.27 million respectively for each fund in 2015).²⁴ To enhance the accountability of the wealth management funds the Sovereign Wealth Funds Unit of the Ministry of Finance releases every year a complete report on the performance of the SWFs. In addition, the acts of the Financial Committee are published regularly. Chile has achieved the maximum score according to the Linaburg-Maduell index of transparency jointly with other 10 SWFs including Norway, Australia and New Zealand among others.

Table 3.

Sovereign wealth funds management costs (US\$)				
Item	PRF		ESSF	
	2010	2015	2010	2015
Custodian (J.P Morgan)	252.787	1.639.504	622.071	1.295.073
CBC Administration	153.6	947.984	506.4	957.404
International Administration	-	1.884.965	-	622.359
Total costs	406.387	4.472.453	1.128.471	2.874.836
Securities lending	399.802	278.184	1.290.288	2.563.815

Source: Own elaboration based on DIPRES (2015b).

4.3 Macroeconomic effects: Growth volatility and country risk reductions.

As was noted earlier, several authors have documented the fact that the macroeconomic framework of Chile has been successful in reducing output volatility in the last decades. Indeed, as we can see in figure 5, based on Céspedes et al. (2014), there is a significant

²⁴ The related consultancy costs are not shown in the table.

reduction in GDP growth volatility since 1984 with a relatively stable period (lower output volatility) even after the global financial crisis of 2008-09.²⁵

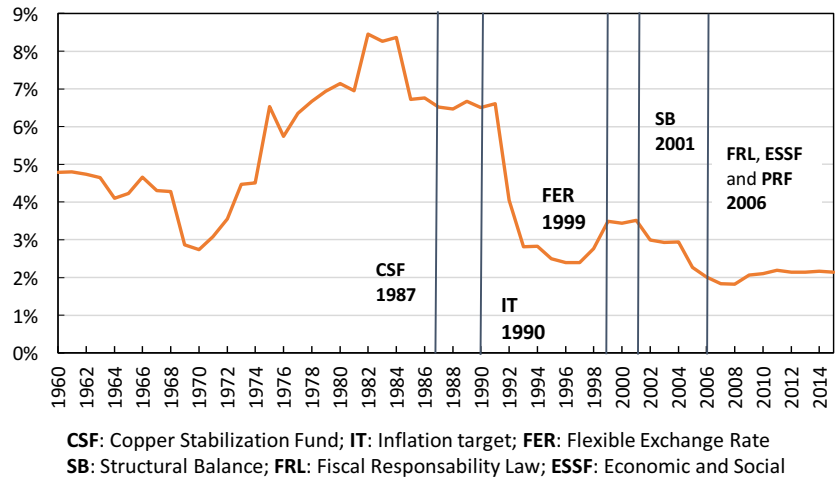
The combination of fiscal rules, two sovereign wealth funds, flexible exchange rates and an independent Central Bank is said to have contributed to lower output volatility in Chile – certainly relative to most other comparable countries. This may be true although it is not simple to ascertain the contribution of each component of the policy package to lower output volatility. In addition, it is fair to say that the actual fiscal and monetary policy decisions following the judgement of specific authorities –rather than the pure mechanical operation of supposedly impersonal policy rules – are likely to have contributed also to lower output volatility.

Another benefit claimed in the literature on the Chilean fiscal rules and sovereign wealth funds is their contribution to a reduction in the country risk (Larraín and Parrado, 2006; Marcel, 2010; Schmidt-Hebbel, 2012). The argument posits that as the government develops its credibility through an independent Central Bank, and a solid fiscal position - along with an important implicit source of collateral namely the ESSF- the risk perception of the economic agents decrease. One manifestation of this, following Marcel (2010), is depicted in Figure 6 where we can observe that Chile's sovereign risk spreads have diminished both in absolute terms and compared with Latin America and Asia regions. Although we cannot assume a causal relation between the adoption of this set of macro rules and the reduction on the sovereign risk spreads, we can observe a slight reduction in the sub-period previous to the global financial crisis, and a level considerable lower than in Latin America in the whole period. Moreover, we can notice that after the global crisis the level of Chile's country risk spreads returned more rapidly to the pre-crisis levels, while Latin America continue over its pre-crisis levels.

Figure 5.

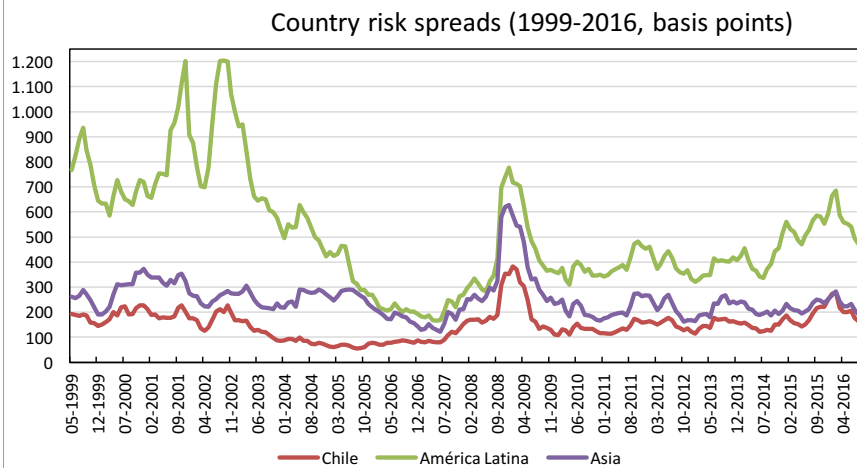
²⁵ To measure volatility the study computes the 10-year rolling window average of the standard deviation of GDP growth.

GDP growth volatility (10-year rolling window) and macroeconomic policies



Source: Own elaboration based on Díaz et al. (2010) and Central Bank of Chile

Figure 6.



Source: Own elaboration based on Central Bank of Chile.

Comentado [AS2]:

5. Evaluation and conclusions

Historically, macroeconomic cycles in Chile have been led by fluctuations in the prices of its main mineral and agricultural commodities. To counteract this trend, for a period after the 1940s the country tried to boost import-substitution industrialization with a productive role attached to the state. However, these industrialization efforts were reversed in the second half of the 1970s as Chile embarked on a neoliberal development strategy (Solimano, 2012). As the economy opened to foreign trade more aggressively in the 1970s and 1980s, the relative importance of copper exports in total exports declined from near 80 percent in the early 1970s to around 50 percent nowadays reflecting the effects of export diversification and a sharp increase in total export volumes. However, in spite of diversification, copper has remained a critical source of fiscal revenues and foreign exchange. Since the 1980s the authorities have developed various mechanisms to dampen the effects of shocks in the copper price on the domestic business cycle.

A copper stabilization fund was created in 1987, and then a fiscal rule in 2001. The fiscal rule was expected to constrain possible spending propensities of the fiscal system and de-

link the domestic economy from the sometimes disruptive effects of terms of trade shocks. In 2006 an Economic and Social Stabilization Fund (ESSF) and a Pension Reserve Fund (PRF) were established as part of a broader *fiscal responsibility law*. There is a relative consensus that these mechanisms have contributed to provide fiscal predictability and have also contained the impact of external shocks on fiscal spending and the business cycle. In addition, it is claimed that this macro framework has contributed to reducing output volatility, reducing borrowing costs and lowering country risk premiums. The IMF and the international financial community often portray Chile as a successful case of the benefits of having fiscal rules, stabilization funds, inflation targeting, independent Central Bank and flexible exchange rates.

The analysis of the paper recognizes progress in these areas but also highlights loose ends in the operation of these funds and draws attention to some trade-offs not always recognized in the laudatory evaluations of the Chilean case. In particular we stress that rules leave substantial space for discretion and their implementation requires non-trivial judgements. Specific features that need to be addressed by policy-makers are: first, the fiscal rule requires predicting, with accuracy, “long run” or permanent values for key parameters such as copper prices, and potential GDP growth. This is not a simple task and has required a proliferation of “expert committees” and frequent revisions affecting the operation of these rules. Second, the value for the “structural fiscal budget” has been changed several times by the authorities in the last decade and a half, thereby reducing its anchoring role on expectations and policy predictability. Third, the stabilization funds (particularly the ESSF) are asymmetric in their operation rules. On the one hand, there are clear rules of accumulation but on the other hand no rules exist for *using* the resources of these funds, say to counteract an economic downturn or recession (tied say to the level of the output gap or the unemployment rate). As of now, the decision of drawing resources from the SWFs depends on the discretionary judgment of the fiscal authority. In addition, it is not possible to track where the resources are finally spent (e.g. on consumption or investment), and therefore to evaluate the efficacy of countercyclical fiscal policies and some of their long run effects. Fourth, it is unclear what would be the “optimal level” of

resource accumulation in various stabilization funds. Currently the ESSF, PRF and the “defense fund” have assets comprising near 10 percent of GDP (this does not include the international reserves held by the Central Bank, that would add, roughly, another 10 percent of GDP). This opens the question of a possible tendency towards *over-insurance* in fiscal management. Fifth, Chile is a country whose levels of public spending in education, health, pensions and other social sectors as a share of GDP are consistently *below* those of the OECD and other Latin American economies of middle and large size. This suggests an opportunity cost of over-investing in stabilization funds in terms of over-restricted social spending in a country with high indices of income and wealth inequality (Gini coefficients for income above 50 percent and for wealth over 70 percent, Solimano, 2016).

Finally, we note that Chile maintains a very generous legislation towards foreign direct investment and domestic companies in the mining sector. This includes low “royalties” along with the perpetual renewal (at almost no cost) of licenses granting mining exploitation rights to incumbent private corporations at the expense of foregone revenues for the Chilean state. This has led to a highly privatized and de-nationalized copper sector. Lastly, CODELCO, the state-owned mining company, lacking an important degree of financial autonomy from the treasury, is forced by law to provide 10 percent of its *gross* revenues to the Armed Forces for the acquisition of military equipment and weapons. This arrangement affects the ability of CODELCO to finance its capital investment projects with its own internal resources and also reduces the availability of fiscal revenues (transferred from CODELCO to the treasury) that could otherwise be directed to social spending and public infrastructure. In our view, these arrangements need to be revised (eliminated?) by parliament.

6. References

Cariola, C. and Sunkel, O. (1985) *Un Siglo de Historia Económica de Chile 1830-1930. Dos Ensayos y una Bibliografía*, Ediciones Cultura Hispánica, Madrid, España.

Céspedes, L., Parrado, E. and Velasco, A. (2014) “Fiscal Rules and the Management of Natural Resource Revenues: The Case of Chile” *Annual Review of Resources Economics*, 6:105–32.

Cochilco (2016) “Factores competitivos de la exploración minera en Chile”. Dirección de Estudios, Comisión Chilena del Cobre, DE/16/2013. Available online at http://www.cochilco.cl/descargas/estudios/tematico/exploracion/factores_competitivos_para_la_exploracion_minera_en_chile_26122013.pdf.

Cochilco (2016) “Yearbook: Copper and other Mineral Statistics, 1996-2015”. Available online at <http://www.cochilco.cl/descargas/estadisticas/anuarios/Anuario2016web.pdf>.

De Gregorio J. and Labbé, F. (2011) “Copper, the real exchange rate and macroeconomic fluctuations in Chile”. In *Beyond the Curse: Policies to Harness the Power of Natural Resources*, ed. R Arezki, T Gylfason, A Sy, pp. 203–33. Washington, DC: IMF.

Diehl, J. (1982, October 3) “Exxon, Others Find Projects Awry in Chile”. *The Washington Post*. Available online at <https://www.washingtonpost.com/archive/politics/1982/10/03/exxon-others-find-projects-awry-in-chile/590c3c43-4470-4c0a-8751-09641436093c/>.

DIPRES (2011) “Una política fiscal de balance estructural de segunda generación para Chile”. Serie de Estudios de Finanzas Públicas N° 18. Ministerio de Hacienda.

DIPRES (2015) “Informe de Finanzas Públicas: Proyecto de Ley de Presupuestos del Sector Público para el año 2016”. Ministerio de Hacienda.

DIPRES (2015b) “Informe Anual de los Fondos Soberanos”. Ministerio de Hacienda.

DIPRES (2016) “Evolución, administración e impacto fiscal de los ingresos del cobre en Chile”. *Serie de Estudios de Finanzas Públicas* N° 23. Ministerio de Hacienda.

Díaz, J.; Lüders, R. and Wagner, G. (2016) “La República en Cifras. Chile 1810-2010”. Santiago: Ediciones Universidad Católica de Chile.

Durán, G. and Kremerman, M. (2015) “Los Verdaderos Sueldos de Chile: Panorama Actual del Valor del Trabajo Usando la Encuesta NESI” Documento de Trabajo Área de Salarios y Desigualdad. Fundación Sol.

Frankel, J. (2011) “A solution to fiscal procyclicality: The structural budget institutions pioneered by Chile”. *NBER Working Paper* 16945, Cambridge, MA.

Franken H., Le Fort G. and Parrado E. (2006) “Business cycle responses and the resilience of the Chilean economy”. In *External Vulnerability and Preventive Policies*, ed. R. Caballero, C. Calderón, L.F. Céspedes, pp. 71–108. Santiago: Central Bank Chile.

Larraín F. and Parrado E. (2008). “Chile menos volátil”. *El Trimestre Económico*. 75(299):563–92.

Lavandero, J. (2004) “Una política para el Cobre chileno”. Santiago Available online at <https://recuperaciondelcobre.files.wordpress.com/2011/04/una-politica-para-el-cobre-chileno.pdf>.

Marcel, M. (2010) “The Structural Balance Rule in Chile: Ten Years, Ten Lessons”. Inter-American Development Bank, Discussion Paper No. IDB-DP-289. Washington, D.C

Meller, P. (2006), *Un Siglo de Economía Política Chilena (1890-1990)*, Uqbar Editores, Santiago.

Millán, A. (2006) “La minería metálica en Chile en el siglo XX”. Editorial Universitaria. Santiago, Chile.

Schmidt-Hebbel, K. (2012) “Fiscal Institutions in Resource-Rich Economies: Lessons from Chile and Norway”. Documento de Trabajo N° 416, Instituto de Economía, Pontificia Universidad Católica de Chile.

Solimano, A. (2016) *Global Capitalism in Disarray. Inequality, Debt and Austerity*. Oxford University Press

Solimano, A. (2012) *Chile: The Neoliberal Trap. The Post Pinochet Era*. Cambridge University Press.

Solimano, A. and Scheaper, M. (2014) “The Paradoxes of Chilean Economic Development: Growth, Inequality, deindustrialization and sustainability risks” in A. Hansen and U. Wethal (eds) *Emerging Economies and Challenges to Sustainability*, Routledge.

Solimano, A. (2015) “El Cobre en Chile: Situación Actual, Perspectivas y Propuestas de Reformas Institucionales”. Working Paper prepared for Universidad de Santiago.

United Nations (1962) “General Assembly resolution 1803 (XVII) of 14 December 1962 (Permanent sovereignty over natural resources)”. Available online at http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/1803%28XVII%29.

U.S Geological Survey (2016) “Mineral Commodity Summaries: Copper 2016”. Available online at <http://minerals.usgs.gov/minerals/pubs/commodity/copper/mcs-2016-coppe.pdf>.