

# **“Fiscal Policy in Chile: Promoting Faustian Growth?”**

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## **Fiscal policy in Chile: Promoting Faustian growth?**

**By**

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“What lies beyond doesn't worry me.  
Suppose you break this world to bits, another may arise.  
My joy springs from this earth,  
this sun shines on my sorrows.  
When I leave here, let come what must.  
What do I care about it now, if hereafter  
men hate or love, or if in those other spheres  
there be an Above or a Below?” **Dr. Faust**  
in **Johan Wolfgang von Goethe's Faust, Part 1 (1808)**

**Abstract:** We show that the tax system in Chile is insufficient, inefficient and inequitable. Insufficient because it does not yield enough revenues for the state to promote human capital development and to face poverty in a more comprehensive way; inefficient because it is highly unbalanced causing most of the tax burden to be concentrated in very few taxes while neglecting the use of the least distortion-prone tax mechanisms available; inequitable because it forces the middle and low income groups to shoulder most of the tax burden while allowing the super rich to get away paying one of the lowest tax rates among middle income and advanced countries.

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## **I. Introduction**

Two salient features have characterized the economic development of Chile during the 1990-2009 period of “Concertación” governments: First, economic growth has been highly unbalanced favoring the rapid growth of traditional natural resource and environment-degrading industries to the detriment of knowledge and human capital-intensive sectors. Second, while poverty has declined over the period, inequality in the distribution of income and wealth has remained at appallingly high levels. Even more ominously, by some measures the degree of inequality has apparently increased over the last two decades.

The central hypothesis of this paper is that fiscal policy has been in part responsible for the lack of progress towards developing an economy that is based more on knowledge-intensive and environmentally clean industries and less dependent on primary and related industries, and that at the same time is less socially unjust. We show that tax policies have not only failed to provide the fiscal resources needed for promoting human capital expansion and to finance more effective anti-poverty and pro-distribution programs, but have instead directly exacerbated inequality.

The emphasis of fiscal expenditures on the provision of public and social goods including health, education and social programs, has been exemplary compared to many other countries that instead devote a large fraction of the government expenditures to wasteful subsidies, often targeted to satisfy the lobbying demands of the rich. However, the key problem in Chile has been the reduced scope of such spending due, in turn, to the incapacity of the tax system to generate enough fiscal revenues.<sup>1</sup> This has made

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<sup>1</sup> In recent years international copper and other commodity prices have been unusually high and, in great part thanks to the jump of revenues from the state copper enterprise, the government has experienced large fiscal surpluses that were mostly saved rather than spent. The existence of unspent revenues during these years does not, however, mean that government expenditures are not constrained by tax revenues. The government rightly chose to save most of the extra resources under the understanding that they do not correspond to permanent or normal revenues.

government expenditures largely impotent to promote a decisive expansion of human capital among the vast majority of the population and to reduce inequality.

### **A. What is wrong with taxes in Chile?**

We show below that the tax system in Chile is insufficient, inefficient and inequitable. Insufficient because it does not yield enough revenues for the state to promote human capital development and to face poverty in a more comprehensive way; inefficient because it is highly unbalanced causing most of the tax burden to be concentrated in very few taxes while neglecting the use of the least distortion-prone tax mechanisms available; inequitable because it forces the middle and low income groups to shoulder most of the tax burden while allowing the super rich to get away paying one of the lowest tax rates among middle income and advanced countries.

At about 20% of GDP, Chile's tax revenue/GDP ratio is one of the lowest among middle and high income countries. The great reliance of tax revenues on mostly regressive indirect taxes reaching more than 66% of all tax revenues is the highest among middle income and OECD countries. Tax expenditures or loopholes- which in Chile also happen to be extremely regressive- at 4% of GDP are much higher than in most middle income countries in Latin America with the exception of Mexico. In addition, while the evasion rate of the value-added tax (VAT) is among the lowest in the world, the income tax evasion rate, estimated at about 50%, is very high given Chile's level of development. Finally, natural resource rents which in a country as dependent on the extraction of natural resources as Chile comprise a very large share of GDP are mostly untaxed.<sup>2</sup> The large number of industries that intensively use or extract natural resources (mining, aquaculture, fisheries, hydroelectric, and forestry, among others) and/or are environmentally dirty (pulp and paper, chemicals, steel and many others) are mostly exempt from paying royalties and/or environmental taxes, respectively, and tend to derive the largest benefits out of existing tax loopholes.

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<sup>2</sup>One of the few exceptions is a small tax surcharge on profits of copper mining (often called a "royalty") established over the last few years.

## **B. What are the economic consequences of Chile's tax system?**

Here is a summary of the key mechanisms by which the tax system affects equity and economic efficiency:

1. The low tax revenues deprive the government of the financial resources needed to spend more on education, provision of technical skills, health care, and social security. This has restricted investments in human capital among the vast majority of the population that depends on the state to access education and health care, has restricted the scope of aid to the poor and the lower middle income classes, has forced ordinary citizens to either spend an enormous share of their income on education and health care in the private sector or to accept the substandard levels of these services provided by the state. The low volume of fiscal spending in these areas has been a factor causing the perpetuation of low skills and poor human capital of the labor force that in turn has become a binding constraint to the expansion of skilled-intensive activities other than the traditional resource-extractive ones. At the same time the under development of human capital has contributed to restrict the income growth of the poor and middle income classes.

2. The tax system is almost single-mindedly directed to provide large incentives to investments in physical capital, particularly for the most traditional resource-dependent and environmentally dirty industries. This is achieved by policies that allow for accelerated depreciation of capital for tax purposes, a myriad of tax deductions for investments, and other generous tax breaks for corporations.

In addition, the so-called tax expenditures (legal tax loopholes) confer especial privileges to powerful established economic interests that obtain the most part of such tax expenditures and investment incentives further contributing to transfer wealth from the tax-payers (mostly middle classes) to the very rich. The tax system has yet another way to benefit the rich: It allows very large income tax evasion rates which for reasons discussed below mostly constitute a break for the rich.

The resulting light corporate tax and income revenues required shifting the tax burden to indirect consumption taxes, especially the value-added tax (VAT) which has meant that most of the tax burden has been shouldered by middle and low income groups. We show below that high value-added taxes are likely to be not only regressive but also to cause significant deadweight losses due to the fact that the high VAT reduces the disposable income of the low and middle income classes that face liquidity constraints. This restricts even further their ability to invest in human capital and other assets.

3. The lack of royalties for the use of natural resources and the lack of environmental taxes targeting the most environmental degrading activities prevent the government from raising tax revenues using instruments that are possibly the least distortion-prone of the available tax mechanisms. This not only attempts against economic efficiency but also constitutes another massive implicit transfer of wealth from the average citizen who is in reality the ultimate owner of the country's natural resource patrimony and pays most of the costs of environmental pollution (health and otherwise), to the rich and powerful economic groups that get access to the exploitation of vast natural resources and the environment for free.

Furthermore, the fact that producers using natural resources and the environment are not required to pay for this important factor of production entails an implicit discrimination against sectors that are not resource-dependent and are environmentally clean such as high tech and human capital-intensive activities which have to pay market prices for all their inputs. Effectively, these policies amount to anti-industrial policies; far from stimulating emerging new activities that may possibly have important spillovers such as high tech ones, these policies instead artificially raise the relative ("comparative") advantages of traditional industries that often have few positive externalities or spillovers and many negative externalities. Thus, the persistent refusal to tax natural resource rents and polluters is another mechanism that not only contributes to perpetuating inequality but also to reducing economic efficiency.

### **C. Faustian economics?**

These fiscal policies may be good to maximize growth over the short run but they are not consistent with sustained long run economic growth. Fiscal policies like those implemented over the last two decades may be a case of Faustian economics, where short run output growth is in part achieved at the cost of a stagnating human capital, ever souring social conditions caused by extreme inequality that reduce solidarity, promotes crime and foment discontent, and the continued destruction of the natural capital and the environment.

### **D. The program for the remainder of the paper**

Section II provides empirical evidence illustrating the persistence of highly unbalanced patterns of economic growth and the perpetuation of inequality over the last two decades. Then in Section III we discuss evidence that supports the characteristics of the tax system mentioned in A above. In Section IV we link the fiscal policies of the Concertación to the persistence of social inequality and over dependence of the economy on primary goods as introduced in B above. Finally, in Sections V and VI we discuss the implications of fiscal policy for the long term patterns of economic development.

In the following sections we rely quite heavily on international comparisons in order to assess Chile's fiscal policies. To make these comparisons rigorous we consistently use to the extent possible the same higher income countries in Latin America as well as OECD countries in all our analyses. We use the four richest countries in Latin America (Argentina, Brazil, Mexico and Uruguay) because Chile's income is clearly among the top 5 economies in Latin America over the whole period of analysis. At times we also use poorer Latin American countries to emphasize the fact that in certain respects Chile's indicators are closer to those of lower income countries than to the other four middle income Latin American countries. In addition we use the poorer OECD countries as comparators because Chile is a member of OECD. An exception is in the analysis of royalties where we consider advanced resource-rich countries such as Australia and

Norway not so much as comparators but as examples of policies that Chile could implement.

## **II. Unbalanced Growth and Inequality: A historical perspective**

In this section we show two things: 1. Chile has had one of the most unbalanced patterns of economic growth in the world; 2. Chile's level of inequality is much worse than what earlier studies have purported to show and, even more importantly, it is likely to have increased a great deal over the last two decades.

### *Unbalanced growth: continued reliance on traditional resource-intensive industries*

An indicator of the lack of balance of the Chilean economy and its excessive dependence on resource-intensive and raw material sectors is given by the inordinately low share of the service sector in GDP, given Chile's level of per capita income. The share of the service sector in GDP has been below 56% throughout most of the last two decades (Table 1). This is, according to the World Bank, one of the lowest shares among the richer economies of Latin America. The average share of the service sector in GDP over the 2005-09 period reached 66% in Brazil, 57% in Argentina, 61% in Mexico, and over 63% in Costa Rica compared to slightly less than 52% in Chile. Among the larger Latin American countries Chile's share of the service sector ranks among the bottom three, only slightly above Bolivia's. Thus, even resource-rich countries at similar stages of development as Chile, such as Argentina and Brazil, have a much greater participation of services in the economy. Chile has an underdeveloped service sector and concomitantly an over-grown resource-based industrial sector and primary sectors.

Even more important, the participation of the primary sectors (agriculture, fishing, forestry and mining) in GDP has been above 20% in every year over the last decade regardless of the sharp variations of the world prices of raw materials. Even the manufacturing sector is comprised mostly of activities such as food processing, leather, wood processing, pulp and paper, and mineral refining that are mainly based on the most basic elaboration of raw materials. The participation of electronics, computers, information technology and other more technologically sophisticated activities is



practically negligible. Examining the evolution over the years reveals that there are no clear indications of even a gradual reduction of the degree of dependence of the economy on primary sectors.

Table 1. Services as % of GDP

Country Name	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
Argentina	52.5	62.2	66.1	60.3	57.3
Bolivia	47.6	50.2	53.0	55.1	51.3
Brazil	45.2	52.8	68.2	65.6	66.5
<b>Chile</b>	<b>51.8</b>	<b>52.4</b>	<b>55.2</b>	<b>55.9</b>	<b>51.7</b>
Colombia	45.4	48.5	56.0	60.8	58.2
Costa Rica	55.3	56.8	56.9	61.4	63.2
Dominican Republic	61.7	52.8	54.2	58.6	61.2
Ecuador					58.4
Guatemala	54.2	55.0	56.3	56.0	58.1
Mexico	56.9	65.5	66.1	66.2	60.9
Peru	57.4	62.7	60.9	61.4	57.1
Venezuela, RB	41.7	41.2	48.7	45.2	38.2

Source: WDI, World Bank

Table 2 shows the evolution of another indicator of the extreme dependence of the economy on the primary sectors. The average annual share of exports of primary goods (agriculture raw materials, food, fuels, ores and minerals) in total GDP stood at 32% in the 2005-09 period, much higher than in any other previous five-year period since 1985. It is also the highest among the Latin American economies and it is more than four times the average value for Latin America and the Caribbean. Part of the period 2005-09 saw very high international commodity prices but even in 2000-04, a period of relatively low commodity prices, the reliance on primary exports was not any different from the last pre-Concertación five-year period (1985-89).

Also, the gap between the reliance on primary exports between Chile and the rest of Latin America has tended to increase rather than decrease over time despite that Chile grew faster than the rest of the Region. As can be seen in Table 2, the ratio of primary exports to GDP in Chile relative to that of Latin America as a whole was 2.6 (23.8/8.8) in 1985-

89 and increased to 3.6 (32/8.9) in the period 2005-09. Moreover, this gap ratio has been above 2.9 in every five-year period since 1990.

Table 2: Percentage of Exports of Primary Goods<sup>a</sup> in GDP

Country Name	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
Argentina	5.8	4.5	5.7	12.3	14.0
Brazil	4.7	3.5	2.9	5.2	6.0
<b>Chile</b>	<b>23.2</b>	<b>19.2</b>	<b>18.2</b>	<b>23.1</b>	<b>32.0</b>
Mexico	10.0	5.1	5.2	4.3	6.3
<b>Latin America &amp; Caribbean</b>	<b>8.8</b>	<b>6.1</b>	<b>5.8</b>	<b>7.8</b>	<b>8.9</b>
OECD countries	3.0	2.7	2.7	2.8	4.0
Ireland	15.0	13.7	10.3	6.3	5.6
Korea, Rep.	2.4	1.6	2.4	2.6	4.2
New Zealand	15.6	16.6	14.8	15.4	15.1
Portugal	4.2	3.2	2.9	2.7	4.0
Spain	3.3	2.7	3.7	3.9	3.2
<b>Upper middle income countries</b>	<b>9.8</b>	<b>7.1</b>	<b>8.0</b>	<b>10.9</b>	<b>12.4</b>

Source: WDI and own calculations

<sup>a</sup> Include agriculture raw materials, food, fuels and ores and mineral exports

### *On the level of Inequality*

Using household survey data (CASEN) for the year 2003, López and Miller (2007) concluded that inequality was then as deep as in the last years of the military dictatorship and that most of the inequality occurred between the richest 10% of the households and everyone else. Table 3 shows that six years later nothing has changed. In 2009 the household survey shows that inequality between the richest 10% and the rest of the households remains as deep as in 2003 although some progress was made in terms of reducing poverty.<sup>3</sup> The gini coefficient in 2009 showed some modest improvement with respect to 2003 from 0.57 to 0.55. But the inequality between the top 10% and the rest of

<sup>3</sup> But even in this latter aspect progress was uneven. Poverty measured at the end of 2009 became significantly worse vis-à-vis the year 2006. While in 2009 GDP fell by 1.7%, the levels of poverty and extreme poverty increased by more than 10% with respect to 2006 despite that the between-years were quite prosperous, with growth rates of 4.6% in 2007 and 3.7% in 2008. This large sensitivity of poverty levels to even short run economic slowdowns illustrates the inadequacy of using poverty measures that do not account for the vulnerability of the “non-poor”; that is for the massive clustering of households in income levels that are often very near the “poverty line”.

the households did not change as shown by the 10/40 ratio which at 3.4 remained unchanged.

Table 3: Evolution of Poverty and Inequality Measured by CASEN household surveys(1987-2003)

<b>Year</b>	<b>Poverty (%)</b>	<b>Extreme Poverty (%)</b>	<b>20/20 INDEX</b>	<b>10/40 INDEX</b>	<b>GINI COEF</b>
1987	45.1	17.4			0.57
1990	38.6	12.9	14.0	3.5	0.57
1992	32.6	8.8	13.2	3.3	0.56
1994	27.5	7.6	14.0	3.4	0.57
1996	23.2	5.7	14.8	3.5	0.57
1998	21.7	5.6	15.6	3.5	0.58
2000	20.6	5.7	14.5	3.5	0.58
2003	18.8	4.7	14.5	3.4	0.57
2006	13.7	3.2	13.1	3.0	0.54
2009	15.1	3.7	15.7	3.4	0.55

Source: Mideplan, Social Division from Casen Surveys

Surely, the real source of inequality remains to be the incomes at the top of the distribution. In fact, the inequality among the bottom 90% of the households is rather small. Solimano and Torche (2008) estimate a gini of 0.38 for the bottom 90% of the population, which reflects a relatively egalitarian distribution. Moreover, as is well known, household surveys greatly under estimate the true incomes of the rich as they are simply not represented in most surveys (Aguiar and Bils, 2009; Attanasio and Szekely 1999). What this means is that the real gap between the richest 10% and everyone else is even greater than what the CASEN-based data show.

Most analyses estimating the share of the rich in total income use income tax data rather than household survey data, although income tax data also tends to under estimate the income of the rich due to tax evasion among other reasons (Brandolini and Smeeding, 2008). Unfortunately, there are no analyses of distribution using income tax data in Chile.

Sanhueza and Mayer (2009) provide estimates of the share of the top 1% of households based on a large survey for Santiago which has been conducted over several decades using a consistent methodology. They report that the share of the top 1% of the

households over the 2005-08 period was 9.6%. This estimate is obviously downwardly biased as shown by comparing it with estimates for many developed countries (including some that are regarded as highly egalitarian such as Germany and Canada) which yield much higher shares (Atkinson et al., 2010).

Below we use wealth estimates of the super rich published annually by Forbes, to estimate the annual income of a small but important fraction of the wealthiest households that are not represented in the household surveys; we add this income to that of the richest 1% measures obtained from the household survey data to obtain a lower-bound estimate for the participation of the income of the top 1% in total income.

The four Chilean individuals appearing in the 2010 Forbes's list have a combined fortune of US\$43 billion. We also have changes of their wealth over the 2002-10 period which allows us to obtain estimates of their annual income flows. With all certainty these individuals as well as a handful of other super rich are not represented in any of the household surveys so it is legitimate to add their estimated income flows to the top 1% of the household as measured by the household surveys.

We can estimate the long run annual income of the Chilean super rich by comparing the evolution of their fortunes over time as measured by Forbes. We look at the period 2002-2010, which includes both booms and deep recessions, so this period may be considered normal. We consider 5 individuals (the "Big Five") appearing in the Forbes's list of billionaires in 2010 or at least in one year over the 2002-10 period. We assume that those that appear in the 2010 list but not in 2002 had already US\$1 billion wealth in 2002, and for the one case that is in the list in 2007 but not thereafter (due to the death of the individual in that year) we assume that the family fortune did not increase at all in subsequent years. With this we can estimate the average annual net wealth increase over the period for the Big Five by taking the difference in wealth levels over time and dividing by the number of years.

However, this figure corresponds to their net annual savings or wealth accumulation but not to their total annual income because they also consume part of their income (expeditions to escalate Mount Everest are indeed very expensive!). We again conservatively assume that their propensity to save is very high, 85%. This implies that we can obtain an estimate of their annual income flow by multiplying the annual increase in wealth by 1.18. As Table 4 shows the average income of the Big Five estimated in this way was \$6.3 billion per annum. According to the Central Bank of Chile the average annual gross national income (GNP) in current dollars over the period 2002-2010 was \$94 billion and the annual measured household income according to the CASEN surveys over the period was about \$70 billion. Thus, the income of the Big Five corresponded to 6.7% of the average annual GNP of the country and to 9% of the total annual average household income as measured by the household surveys and 8.3% of the total household income (where total household income reported by CASEN has been augmented by the estimated income of the Big Five).

To compute the total share of the richest 1% of the population we first add the estimated annual income of the Big Five to the survey average annual total household income, giving \$76.3 billion. Next we add the estimated value of the income of the top 1% in the survey which is equal to \$6.7 billion (9.6% of \$70 billion) to our estimates of the average annual income of the Big Five, \$6.3 billion. This implies that the augmented average annual income of the top 1% is \$13 billion. Dividing this by the total augmented annual household income (\$76.3 billion) we obtain a new estimate for the share of the richest 1% now including the Big Five at 17% of the total household income.<sup>4</sup> This would place Chile second among all the 22 countries for which this share has been measured using income tax data, only slightly below the USA where the share of the richest 1% is estimated at 17.6% (Atkinson et.al., 2009).

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<sup>4</sup> One can estimate the true gini coefficient using a formulae derived by Alvaredo (2011) for the case when an infinitesimal number of individuals own a finite share of total income. He shows that in this case the true gini is  $G = (1 - s)G^* + S$ , where  $G^*$  is the measured gini excluding the super rich and  $S$  is the income share of the super rich. Using the household survey measured gini,  $G^* = 0.55$ , and the above estimated share of the Big Five,  $S = 0.09$ , we obtain that the true gini is about 0.59.

Table 4. Wealth, Wealth Changes, and estimated annual income of the Big Five over the 2002-2010 period (billion US\$)

	Wealth in 2002	Wealth in 2010	Change in Wealth
Luksic	1.4	19.2	17.8
Matte	1.5	10.2	8.7
Paulmann	1.0	10.5	9.5
Angelini	1.0	6.0	5.0
Pinera	1.0	2.4	1.4
Total	5.9	48.3	42.4
<b>Annual average net wealth increase of the big five</b>			<b>5.3</b>
<b>Estimated annual income of the big five</b>			<b>6.3</b>
Annual GNP			94.0
Annual average total household income as per CASEN			70.0
Average annual income of the "big five" as % of total GNP in the 2002-2010 period			6.7%
Average annual income of the "big five" as % of the CASEN-based household income in the 2002-2010 period			9.0%
<b>Revised Share of richest 1% of households including the big five as % of total augmented household income</b>			<b>17%</b>

Sources: Forbes Magazine, World's Billionaires rankings. Central Bank of Chile, own calculations

This estimate is likely to be a lower bound for several reasons: First, because we assumed that the Big Five not appearing in the 2002 Forbes list had exactly 1 billion; most likely they had less than 1 billion in the base year and so their increased wealth and hence their annual income over the period has been larger than what we estimated. Second, we excluded other very rich people that are neither included in the Forbes list nor are represented in the household survey sample.

In summary, the income distribution analysis shows two things: first, the Concertación period appears to have been an incredible prosperous period for the super rich. Second, at about 17% and 9% of total income the shares of the richest 1% of the population and especially of the five billionaires, respectively, have reached levels that may be regarded as socially intolerable. In general, the picture emerging by merely including the five richest individuals makes the earlier analyses of distribution based on household surveys to appear quite trivial and over optimistic. Studying distribution by focusing only on

household surveys information and neglecting the super rich amounts to ignoring the 800-pound gorilla sitting in our living room.

*Has Inequality worsened during the last two decades?*

So far we have provided more realistic lower-bound measures of the levels of inequality. Another question is whether inequality has increased over the Concertación government periods. One way of checking whether distribution has worsened over the last two decades is to check whether or not the gap between the *average* and the *median* per capita household income has been increasing. The estimates of the median per capita household income from the household surveys are likely to be a good estimate of the true one given that the number of super rich households that are excluded from these surveys is very small. However, the measures of the average per capita income from the household surveys are greatly underestimated due to the fact that the few very rich individuals not included in the surveys comprise a large proportion of the total income. We thus compare the median household per capita income measured in the surveys with per capita GDP of the country.

As is well known in practically every country household income is much lower than the per capita GDP. That is normal as GDP measures include items such as net payments to foreigners and others as well as the income of the super rich domestic households which the household estimates do not account for. But here we focus on comparing the annual rate of *change* of these variables not their levels. In this respect there are no clear patterns among countries; in some countries per capita household income has grown faster than per capita GDP while in others it has grown at a slower rate over the last two decades (OECD, 2011). Using the estimates of the rate of growth of the median household per capita income provided by the income distribution project of OECD (2008) it follows that Chile is clearly among those countries where per capita GDP has grown faster than per capita household income. In fact, over the last two decades there is no other OECD country that has exhibited a bigger gap between the two measures.

According to OECD (2011) the annual rate of growth of the median household disposable income (which includes transfers to households) in Chile over the last two decades was 2.4%, much lower than the 4.2% annual growth rate of per capita GDP. This large gap is one very succinct indicator of the inequality of economic growth not merely of income levels. It means that an increasing share of the output produced in the country is being appropriated by either foreign investors or by the rich end of the domestic income distribution that is generally excluded from the household surveys.<sup>5</sup> This is an indirect indicator showing that income has become more concentrated in the super rich whose income is not reflected in the household surveys and in foreign investors that have been able to capture an increasing share of the domestic output.

### **III. Tax Policies and the elites**

#### *Low tax revenues*

Chile has the lowest tax revenue per dollar of GDP among all OECD countries. In 2006 the total tax receipts in Chile amounted to 20% of GDP compared to an average of 36.3% for all OECD countries (Figure 1). As shown in Figure 1, even within Latin America, Chile's tax revenues as a proportion of GDP are much lower than that of the most developed countries in the region, including Brazil (34%), Argentina (27%) and Uruguay (25%). A recent survey by ECLAC (2009-10) finds that Chile is well below the international tax revenue norm given its per capita income. These low levels of tax revenues impose a tight binding constraint on the scope of public expenditures which have generally been quite effective in reducing poverty (López and Miller, 2008).

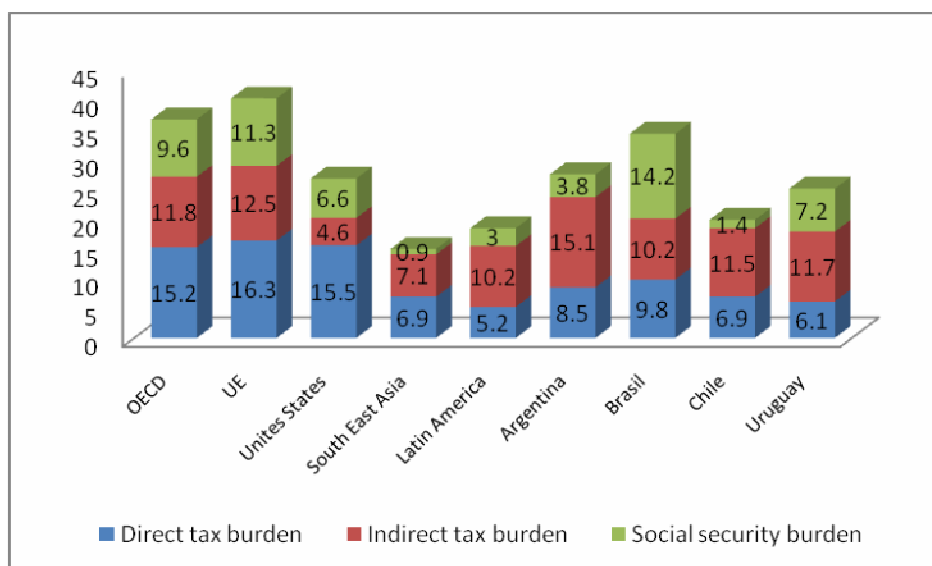
By the early nineties there was a consensus in Latin America that the tax systems originated in the dictatorial regimes of the eighties were greatly insufficient to raise the tax revenues needed to finance the more progressive social policies that democratic governments were required to implement in view of the prevailing high levels of poverty and concentrated income distribution. This led to tax reforms that succeeded in most countries of the Region to significantly increase tax revenues.

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<sup>5</sup> The fact that net national income per capita has also increased faster than the median household income is consistent with the idea that the distribution has not only become proportionally more biased toward foreign investors but also more biased toward the richest domestic households.



Figure 1. International Comparisons of the Tax Burden in 2006 (% of GDP)



Source: Gomez and Martner (2010).

While Chile did manage to increase tax revenues as well, its efforts in this respect were much more timorous than in most other countries in the Region. In fact, the evolution of tax revenues in Chile over the 1990-2006 period shows only a slight increase of about 19%, from 16.5% of GDP in 1990 to 19.7% in 2006 (Table 5). According to Jorratt (2009) the average tax burden during 1987-90 corresponding to the last four years of the military dictatorship was 17% of GDP while the average tax burden during 2006-09, the last four years of the Concertación governments, was slightly more than 19% (ECLAC, 2010).

As can be seen in the Table 5, Chile's 19% increase in tax revenues over the period 1990-2006 contrasts with the evolution in most other countries in Latin America where tax revenues have increased much more rapidly. The average tax revenues over GDP for the group of 19 Latin American countries increased by 47% over the period, and among the high per capita income countries in the region (Brazil, Chile, Uruguay, Argentina and Costa Rica) the average tax revenues increased by more than 30% from 19.7% to 25.7%. That is, Chile not only has one of the lowest tax burdens among the countries with comparable per capita incomes in Latin America, but also has been one of the most

conservative countries in terms of reforming its tax system to allow for greater tax revenues.

Table 5. Tax Revenues of the Central Government (as % of GDP)<sup>1</sup>

	1990	2000	2006p	Average 1990-2006
Group 1	19.7	22.7	25.7	22.3
Brasil	26.4	30.4	34.2	28.5
Uruguay	22.4	23.6	25.6	23.8
Argentina <sup>1</sup>	16.1	21.5	27.4	21.7
<b>Chile<sup>1</sup></b>	<b>16.5</b>	<b>19.2</b>	<b>19.7</b>	<b>18.9</b>
Costa Rica <sup>1</sup>	16.9	18.9	21.4	18.9
Group 2	11.6	15.9	19.9	15.6
Honduras <sup>1 2</sup>	15.3	17	19.3	16.8
Colombia	10.9	16.8	20.7	16.6
Nicaragua	9	17.5	21.3	15.9
Panama	14.7	16	15.9	15.7
Peru	11.6	13.9	16.4	14.6
Bolivia	8.2	14	25.7	14
Group 3	7.9	10.4	12.5	10
El Salvador	8.9	13	15	12.6
Mexico	12.6	12.1	11	12.3
Dominican Republic	8.2	12.7	14.1	11.9
Paraguay	9.9	12	13.5	11.8
Ecuador	10.1	11.6	14.2	11.2
Guatemala	7.6	10.9	12.1	10.3
Venezuela	4.4	9.4	12.6	9.3
Haiti	7.3	7.9	10	7.4
Simple Average Latin America	12.5	15.7	18.4	15.4

Source: Gomez and Martner (2010)

1: Tax revenues correspond to the General Government.

2: Data corresponding to 2005.

### *High reliance on indirect taxes*

The tax structure of Chile continues to be heavily reliant on indirect taxes while income taxes provide a much smaller fraction of all revenues and constitute a very low proportion

of GDP. In 2006 almost 60% of the total tax revenues were originated in indirect taxes (Jorratt, 2009). As can be seen in Figure 1 this dependence on indirect taxation is extremely high by international standards. In contrast, only 30% of the tax revenues in Brazil correspond to indirect taxes, 55% in Argentina and 47% in Uruguay. Even the average dependence on indirect taxes for nineteen Latin American countries at 54% was lower than that of Chile while the average share of indirect taxes in the OECD countries was 32%, about one half that in Chile.

Over the last two decades the participation of indirect taxes in total revenues in Chile has declined significantly and concomitantly the share of direct taxes in total tax revenues has steadily increased, from an average of about 21% of the total tax revenues in 1990-93 to an average of 32% in 2004-06 period (ECLAC, 2010). However, at 6.9% of GDP the share of direct taxes in Chile is still very low by international standards. Among the comparable middle income countries we have that Brazil's income tax revenues have been about 10% of GDP over the last few years and Argentina's above 8%.

#### *Low corporate income taxes*

Corporate income tax rates have also remained very low at 3.2% of GDP over the period 2004-06, which is higher than the 2% shares observed over the early nineties, but still implies a very low effective tax rate for corporations (Jorratt, 2009). Using the well accepted lower bound estimate for the share of capital in GDP of 50% (World Bank) this would yield an effective tax rate on profits equal to about 6.4%, well below the legal corporate rate of 17%.

#### *Large tax expenditures or legal loopholes*

According to a recent study by the Chilean tax office (SII, 2006), tax expenditures were extremely high reaching 4% of GDP and more than 20% of all tax revenues in 2004. According to the study about 80% of the tax loopholes consisted on a variety of income tax exemptions and another 18% affected the VAT. These large tax loopholes not only subtracted tax revenues to the state but also are greatly regressive. The above study found that more than 80% of the income tax loopholes benefited the wealthiest 5% of the

population and 60% goes to the richest 1% of the population. That is, the wealthiest 1% of the people receives an annual transfer equivalent to 2% of GDP via tax expenditures. With respect to the VAT tax expenditures, the study shows that it is also quite regressive, albeit to a lesser extent than the income tax loopholes. About 70% of the VAT loopholes benefit the richest quintile of the population.

Of all income tax loopholes, tax deferrals especially directed to create incentives for investment in capital equipments and others are one of the most important component. Tax deferrals are due mainly to exemptions to retained profits. However, it appears that part of the retained profits are never distributed because they correspond to “profits” generated by paper firms created for the specific purpose of avoiding the high personal income marginal tax rate which reaches 40% for high incomes. These paper firms then become owners of durable consumption goods that are in fact used by the individuals.

Table 6 provides more updated figures about tax expenditures for Chile and compares Chile’s tax expenditures from those of other Latin American countries. As can be seen in the Table, Chile’s tax expenditures increased to 4.4% of GDP in 2005 (compared to 4% reported for 2004) and then increased again to about 4.9% of GDP in 2007 and finally returned to the levels of about 4% in 2009. That is, over the 2004-09 period there have been no clear trends towards decreasing the importance of tax expenditures despite the recognition that such expenditures are highly regressive. Also, comparing to the other countries, it follows that Chile’s tax expenditures are among the highest in the group of comparable countries considered in the Table 6. In particular, the rates for Brazil and Argentina have been lower by a significant margin than Chile’s in every year for which data are available. Only Uruguay has had higher tax loophole rates than Chile.

Table 6. Tax Expenditures in Latin America (% of GDP)

	2005	2007	2009
Argentina	2.21	2.2	2.08
Brazil	1.69	2.29	3.2
<b>Chile</b>	<b>4.38</b>	<b>4.88</b>	<b>3.96</b>
Colombia	3.7	3.52	N/A
Peru	2.07	2.22	1.81
Uruguay	4.75	4.59	5.61

Source: Vilella (2011)

### *High rates of income tax evasion*

Tax evasion rates in Chile are very disparate depending on the type of taxes; are low for indirect taxes, especial for the VAT, but are high for income taxes. In fact, the tax evasion rate for the VAT, estimated at about 11%, is the lowest in Latin America (Gomez Sabaini, 2010) and is among the lowest in the OECD countries. By contrast, the rate of income tax evasion is quite high reaching almost 50% (Jorratt, 2009) and according to Gomez Sabaini (2010) comparable to several countries in Latin America including Argentina (50%), Mexico (46%), Perú (51%) and El Salvador (51%).

Table 7, taken from Gomez Sabaini (2010), shows tax evasion rates for a sample of 12 countries in Latin America: while Chile has by far the highest efficiency in collecting value added taxes with an evasion rate that is equal to about one half the evasion rate in the second most efficient country in the sample, it shows a mediocre performance in collecting income taxes.

In 2005 the effective income tax revenues in Chile were about 5.9% of GDP. An evasion rate of 49.7% as estimated by Gomez Sabaini (2010) would imply a revenue loss of 5.8% of GDP.<sup>6</sup> Using somewhat more detailed data, Jorratt (2009) estimated a lower value for

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<sup>6</sup> Using a different approach to estimate tax evasion we arrive at tax evasion estimates that are very similar to Jorratt's. A recent study showed that legal corporate tax loopholes amounted to about 3.2% of GDP (SII, 2006). Given that the corporate tax rate is 17%, this means that the theoretical effective corporate tax rate should be about 13.8% once legal loophole deductions are considered. Thus, the effective corporate taxes paid are about one half of the theoretical after legal tax deductions rate suggesting a tax evasion of about

income tax evasion, of the order of 4% of GDP. In any case even if we use the latter estimates we must conclude that income tax evasion is indeed quite massive.

Table 7. Tax Evasion Rates in Latin America

	Value Added Tax		Income Tax	
	Tax Evasion Rate	Estimation Year	Tax Evasion Rate	Estimation Year
Argentina	21.2%	2006	49.7%	2005
Bolivia	29.0%	2004	n.d	n.d
Chile	11.0%	2005	47.4%	2003
Costa Rica	28.7%	2002	n.d.	n.d.
Colombia	23.5%	2006	n.d.	n.d.
Dominican Republic	31.2%	2006	n.d.	n.d.
Ecuador	21.2%	2001	63.8%	2005
El Salvador	27.8%	2006	45.3%	2005
Guatemala	37.5%	2006	63.7%	2006
Mexico	20.0%	2006	41.6%	2004
Nicaragua	38.1%	2006	n.d.	n.d.
Panama	33.8%	2006	n.d.	n.d.
Peru	n.d.	n.d.	48.5%	2006
Uruguay	26.3%	2006	n.d.	n.d.

Source: Gomez-Sabaini (2010)

In Chile like in most Latin America, income taxes affect mainly the upper 10% to 15% of the population. Income taxes are automatically deducted from workers' wages but the richest segments of income tax payers obtain most of their income from non-wage sources which gives them much greater scope for under declare their incomes. This means that most tax evasion benefits the richest segments of the population that rely on non-wage revenues as their primary source of income. So we can expect that income tax evasion is at least as regressive as legal tax loopholes.

While it is in general easier to control evasion on indirect taxes such as the VAT than on income taxes, the gulf between evasion rates affecting the two types of tax in Chile is

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50% which is consistent with the estimated 49.7% income tax evasion rates reported by Jorrat (2009). The combination of legal loopholes and evasion subtracts 63% from the theoretical corporate income tax revenues.

perplexing. As can be seen in Table 7, in most countries in the Region for which there are data for both VAT and income tax evasion, the ratio of VAT/income tax evasion is about one to two and for some one to three. But for Chile such ratio is almost one to five. This may suggest that for some reason the Chilean governments must have made a conscious decision to place lower emphasis in collecting income taxes than value added taxes. A key question is how a system that is exemplary efficient in enforcing tax collections in some areas can be so ineffective in others.

Two factors may explain the high income tax evasion rates: first, the very large difference between the maximum personal income tax rate and the tax rate on profits. The maximum marginal personal income tax rate is 40%, much higher than the legal tax for retained profits which has been around 17% during most of the period considered. In reality this difference is much greater because of the many investment allowances and other legal loopholes that allow firms to reduce their profit tax to levels closer to 10%. High income individuals receiving non-wage income have created paper firms allowing them to transform income into profits thus eluding taxes. In addition, the tax office faces great restrictions in accessing bank account information, much greater than in other countries including Argentina (Fairfield, 2010). The study by Fairfield (2011) has also shown that this has drastically limited the ability of the tax office to control income tax evasion.

In summary, the combination of income tax evasion and legal tax loopholes may easily reach at least 8% of GDP or 40% of the total government tax revenues. Part of these tax benefits, especially the tax deferrals and accelerated depreciation allowances, may create additional incentives to investment in physical capital, but another significant part constitutes mainly tax losses. These not only represent massive losses of financial resources for the government but in addition are resources that are appropriated mainly by the very rich.

### *Capital gains go mostly untaxed*

Most capital gains are tax-exempt including capital gains associated with the sale of most stocks, mutual funds and real estate. Chile is one of only three countries in the OECD that refrains from taxing both long and short term capital gains. In Latin America, most of the high income countries do have capital gain taxation. Mexico has a 35% rate and Brazil a 15% for short-term and long-term capital gains. Among the OECD countries most impose tax rates in the range of 30-40% on short-term capital gains and 20% to 30% on long-term capital gains (Dalsgaard, 2001).

Allowing capital gains to be untaxed represents another large break for the wealthy and also provides yet another mechanism for them to evade income taxes by disguising part of their income as capital gains. The conventional justification for refraining to tax capital gains is that it would reduce the international competitiveness of the Chilean financial markets. However, the fact that most middle and high income countries in the world do impose capital gain taxes renders this argument quite implausible.

### *Ineffective inheritance tax*

The inheritance tax rate theoretically can be as high as 35% but tax revenues actually collected are extremely low yielding an insignificant part of the total tax revenues. In fact, the revenues collected by this tax have in recent years averaged about \$60 million per annum or just 0.2% of all tax revenues (Jorratt, 2009).

This may suggest that the inheritance tax is poorly conceived allowing for the existence of significant mechanisms for elusion and/or low enforcement that tolerates high rates of evasion. In principle a well conceived and enforced inheritance tax can potentially be an important source of tax revenues and an effective vehicle to ameliorate economic inequality.

An argument often used by those opposing inheritance or other wealth taxes is that they constitute double taxation, by taxing wealth that has already been taxed when it is generated. However, in view of our previous analysis regarding income taxes, this



argument lacks validity. As we have shown, the rich have been able to accumulate large fortunes in part thanks to legal and illegal schemes that have allowed them to pay extremely low effective income tax rates over the years. An inheritance tax is often the last opportunity for society to recover part of the tax revenue losses that a defective income tax system and lax enforcement has engendered.

#### *Negligible royalties on rents to natural resources*

A large fraction of Chile's GDP consists of rents to natural resources. Just the rents generated by the production of copper and its many valuable byproducts (including silver, gold and molybdenum) were estimated at about US\$21 billion per annum over the period 2005-09 (CENDA, 2010).<sup>7</sup> This represents about 14% of the average annual GDP over the period which was US\$150 billion. Of these rents, about US\$7 billion were generated by the state enterprise (CODELCO) most of which were paid to the central government. The large private copper mines produced net annual incomes or rents for the remaining US\$14 billion (and paid about US\$2.6 billion in taxes). If one includes the other major industries using natural resources including salmon, other fisheries, non-copper mining, hydroelectric and forestry, the volume of rents are likely to be significantly higher. There are no estimates of resource rents for the non-copper sectors so one cannot directly obtain a reliable estimate of the total rents.

However, using new estimates of wealth recently developed by the World Bank one can indirectly obtain an estimate of the volume of non-copper rents. The World Bank estimated that the total value of tangible wealth for Chile, which includes produced physical capital and natural capital, at a level equivalent to 6.3 times the annual GDP (World Bank, 2011). Natural wealth comprises 60% of this estimate and the remaining 40% corresponds to produced capital. That is, using as a reference the annual estimate for GDP over 2005-2009 of US\$150 billion this means that the total tangible wealth of Chile was about US\$950 billion of which US\$560 billion was natural wealth and US\$390 billion was produced capital.

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<sup>7</sup> The 2005-09 period is representative because it includes years of both exceptional high and low international copper prices. The rents are defined as the total revenues of copper and by products less the total cost of production including interest and all other capital costs.

If we use as a benchmark an annual rate of return of only 6% for natural capital we obtain that the total annual returns to natural wealth is US\$34 billion or 23% of GDP.<sup>8</sup> Given that the total annual copper rents amounted to US\$21 billion this would mean that the rents for the non-copper resource sectors would amount to US\$13 billion. That is, non-copper rents would equal slightly less than 9% of GDP. About 62% of the total resource rents of the country are generated by the copper sector and 38% by all the remaining resource-based sectors including fisheries, forestry, non-copper mining, hydroelectric power, and others sectors that rely heavily on natural resources.

The natural resources are a patrimony that belongs to all Chileans and yet the government has given rights of exploitation of such resources for free to large foreign and domestic corporations. Given that the state has given away the rights to exploit natural resources one may expect that the corporations that exploit such resources be required to pay a royalty for them over and above the normal taxation. That is, the resource rents should be captured by the ultimate owner of the natural resources, the citizens of the country through the state. Since these rents are returns accruing to corporations that are allowed to exploit them over and above the normal returns to their capital, taxing these rents in principle would entail no economic distortions and would not discourage investments as long as the firms are still allowed to obtain normal or above normal rates of return to their investments. In practice, however, it is difficult to ascertain what the “normal” returns to produced capital are, so it is often necessary to be cautious in setting levels of taxation that would allow corporations to retain part of the resource rents.

This is the understanding in most resource-rich advanced countries that have established a variety of mechanism to get a significant part of the resource rents while still allowing some margin to prevent that the returns to produced capital fall below a normal rate which could, in turn, discourage investment and cause deadweight losses. Countries such as Norway and Australia are able to share a much greater part of the resource rents than

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<sup>8</sup> A long term capital rate of return of 6% has often been used by economists in the context of climate change (Nordhaus, 2007) The implicit rate of return to natural capital obtained by copper mines in Chile has been estimated at levels many times higher than 6% (Riesco, 2008).

Chile. In fact, Australia uses especial taxes on the rents of mining firms that imply an effective net income tax equivalent to more than twice the rate paid in Chile by the very same mining firms (Cenda, 2010).

Other countries combine especial exploration and exploitation rights with actual royalties applied to sales values. As shown in Table 8 Norway charges a 10% royalty on the total value of sales in addition to significant exploitation and exploration rights as well as a 10% surcharge on profits (Figueroa et.al. 1998).

This contrasts with the case of Chile, where copper firms are assessed a modest 5% surcharge on declared profits as the only intent to share part of the resource rents.<sup>9</sup> With this surcharge the effective corporate income tax rate for copper firms reaches 18.5% which is less than half of the rate that the Australian government charges to some of the same mining firms working in Chile.

Table 8. Natural Resources' Policies in Chile and Noruega

	Norway	Chile
Rights of Exploration	substantial	very low mining patent
Rights of Exploitation	Substantial	very low mining patent
Royalty over sales	10% base, which goes up with the price	0%
Tax surcharge over profits	10% base, which goes up with the price	5%
Reserve to be exploited by the state company	half	one third
State has quotas of production depending on the demand?	yes	no

Source: Figueroa et.al. 1998

The Chilean government does not apply any royalty or special tax surcharge to any of the other natural resource rents despite that a vast amount of land, water and other resource

<sup>9</sup> After the 2010 earthquake the tax surcharge has been increased to about 8% of declared profits.

rights have been arbitrarily allocated to selected private firms for free and often in perpetuity.

Chile is missing an opportunity to dramatically increase tax revenues (or reduce the rather exorbitant value-added tax currently at 19%) by using taxes that generate no deadweight losses. Taxing natural resource rents is likely to generate financial resources to increase investment in human capital and other assets that would come to replace resource income in the future as natural resources get depleted, and contribute to improve social equity. Chile could increase tax revenues significantly even if it adopted a very cautious approach by letting the resource firms to retain a significant part of the resource rents.

*Taxing part of the rents to natural resources: Revenue potential*

Based on our estimate that natural resource rents constitute about 23% of GDP, if the government allowed resource firms to retain 75% of the rents instead of almost 100% as occurs now, tax revenues would increase dramatically. A surcharge equivalent to 25% of the net rents could increase tax revenues by as much as 3.5% of GDP (some US\$5 billion) or by almost 30% of the current total tax revenues.<sup>10</sup> Using the average copper price of 2005-09 as the “normal” reference price, the net pre-tax earnings of private copper firms are US\$14 billion per annum. These firms paid taxes for US\$2.6 billion per year over this period meaning that US\$11.4 billion of the rents were untaxed. So a 25% tax on the net rents would yield some US\$3 billion per annum in extra tax revenues.

With the new tax surcharge, private mining firms would still pay much less taxes as a proportion of their revenues than CODELCO. In fact, if the surcharge on private mines were equivalent to the one applied to CODELCO it would amount to about US\$8 billion instead of US\$3 billion. This should be a guarantee that the tax proposed is not excessive given that, notwithstanding the fact that production costs of CODELCO are likely to be

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<sup>10</sup> This assumes that resource firms are allowed to deduct the tax surcharge from their net income on which the regular income tax is assessed and we have excluded the profits of CODELCO which already pays much higher tax surcharges.

much higher than those of private firms, the state corporation has remained highly prosperous.

As indicated earlier the non-copper resource sectors generate rents equivalent to 9% of GDP. However, parts of these rents are difficult to tax in part because some of them are produced by small and often poor producers. We assume that only two thirds of these rents (or about 6 % of GDP) can be realistically subjected to the tax surcharge. We assume that the taxable resource sectors pay the average effective income tax rate of 6% that applies to the country as a whole yielding a base for the tax surcharge equal to 5.6% of GDP. Hence, a 25% royalty on these rents would yield 1.4% of GDP or US\$2.1 billion per year.

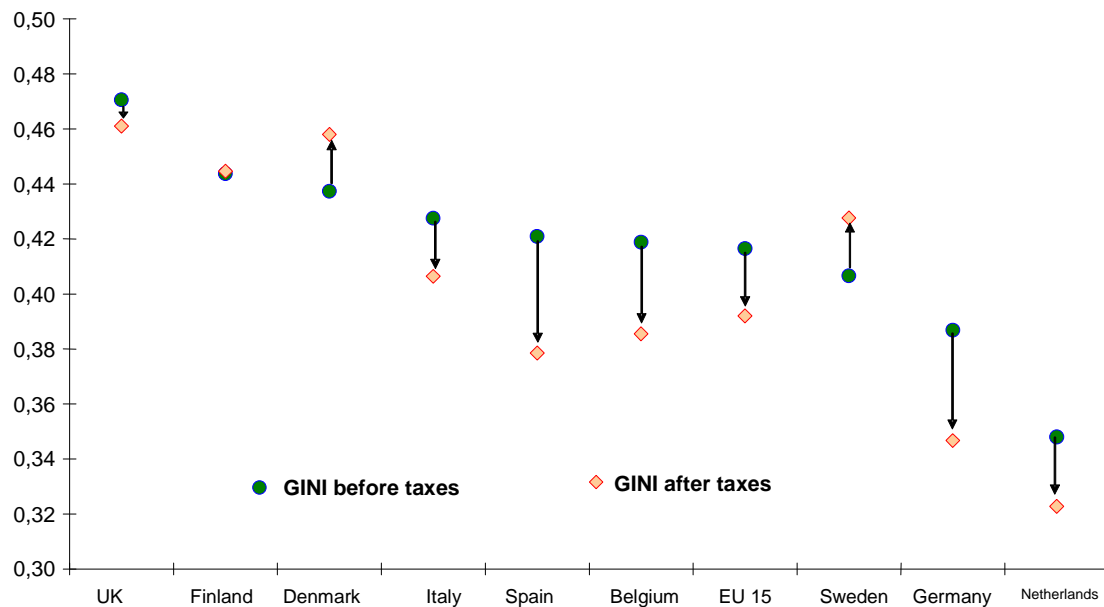
Thus, the total additional tax revenues yielded by taxing private copper and non-copper rents would be above US\$5 billion from about US\$30 billion per annum to US\$35 billion or more than 17%. All this can be achieved by using well-designed mechanisms already successfully implemented by developed countries.

An even more effective alternative mechanism could be to follow the Norwegian model and simply set a 10% royalty on the sales of resource products. Since an overwhelming portion of the sales of primary products are exported this could be achieved by a 10% export tax on copper and other primary exports. The average annual exports of primary products amounted to US\$48 billion over the 2005-09 period of which CODELCO exported about US\$7 billion. Since the state company already pays a higher tax rate the export tax would apply only to the remaining primary exports by private firms. Thus, for our reference 2005-09 period, the 10% export royalty would apply to US\$41 billion of primary exports and would have yielded about US\$4 billion in extra tax revenues. In addition, a similar 10% royalty on the value of domestic sales for resource corporations such as electric utilities and others that produce mainly for the domestic markets may complement the above revenues to yield extra tax revenues similar to those generated by the profit tax surcharges discussed earlier.

*Far from reducing inequality taxes make Chile more unequal.*

The after-tax income distribution in Chile is more unequal than the pre-tax one. This sets Chile apart from most OECD countries and even from several middle income Latin American countries. In fact, in most countries in the OECD the after-tax income gini coefficient is up to 15% lower than the pre-tax gini coefficient (Figure 3). By contrast, in Chile the opposite happens; the after-tax income gini is higher than the pre-tax one (Gomes-Sabaini, 2010). In several countries in Latin America taxes do make a contribution to reduce social inequality. In Argentina and Uruguay, for example, the after-tax income gini coefficient is significantly lower than the pre-tax one while in Mexico and Colombia is neutral. Among the large countries in Latin America only in Brazil and Chile the after-tax income distribution is worse than the pre-tax one (Gomez-Sabaini, 2010). Of course the fact that taxes in Chile exacerbate inequality should not be a surprise in view of the previous analyses which have shown the massive pro-rich biases of the tax system.

Figure 3. Gini coefficients before and after taxes in OECD countries



Source: Gomez-Sabaini 2010

*The tax structure causes unnecessary efficiency losses*

Most taxes cause some deadweight losses and Chile's tax system is no exception. However, as shown earlier Chile has missed the opportunity of reducing efficiency losses significantly by failing to tax natural resource rents. More generally, a key problem with the tax system is its highly unbalanced nature. The tax system tends to rely on extremes: it is highly dependent on absurdly high value-added taxes while it applies very low effective rates to corporations and exempts capital gains almost completely.<sup>11</sup>

Value-added taxes have often been advocated as "efficient" presuming that they would cause fewer distortions than income and profit taxes. However, in highly unequal countries such as Chile a large portion of the population faces severe liquidity constraints as a consequence of their low incomes and of the existence of credit market imperfections.<sup>12</sup> Liquidity constraints become a binding factor limiting investments by the poor and the middle classes (say the bottom 80% or even 90% of the population) in both physical and especially human capital, despite that those investments may have high rates of return. This creates under investment in human capital and consequently efficiency losses which a tax system based on indirect taxes will only make worse by reducing the disposable income of already liquidity constrained households. Forcing those that are most affected by liquidity constraints (i.e., the poor and most middle groups) to pay value-added taxes as high as 19% can only worsen such constraints further impairing their capacity to self-finance socially profitable investments and thus exacerbating economic inefficiency.<sup>13</sup>

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<sup>11</sup> It is as if those that designed the tax system suddenly forgot a maximum of marginal economic analysis: that corner solutions are rarely optimal due to the increasing marginal costs that each tax may cause.

<sup>12</sup> In fact, recent empirical literature has shown that credit market failure and liquidity constraints are pervasive affecting a large portion of households in both poor countries (Haque and Montiel, 1989) and even in rich ones (Attanasio et. al., 2008; Grant, 2007; Jappelli, 1990).

<sup>13</sup> The VAT triggers an income and a substitution effect. In fact, the exorbitant 19% value-added tax may reduce the disposable income of the poor and middle income classes by at least 10% (Engel et al., 1999). A substitution effect in favor of savings or investment arises from the fact that the VAT tax targets mostly consumption expenditures. The literature has shown that the most important determinant of savings is disposable income. The income effect is likely to dominate the substitution effect especially in a context where credit markets are mostly inaccessible to low and middle income households.

Value-added taxes are often justified by appealing to the most naïve textbook models of perfect markets. Value-added taxes in the more realistic second best scenario where taxes coexist with capital market imperfections also cause deadweight losses. These deadweight losses may be larger than those caused by equivalent income, profit or capital gain taxes that exempt middle and low income groups, which are the ones most likely to be affected by liquidity constraints. The implication then is that a tax system that strives to minimize deadweight losses should strike a better balance between income, profit, rents, capital gains, and value-added taxes instead of relying on the latter for almost two thirds of the tax collections as in the case of Chile.

#### **IV. Public spending has contributed to reduce poverty but not inequality**

The share of total public spending in GDP has been consistently below 22% over the twenty years of Concertación governments (Table 9). This is one of the lowest spending ratios among the middle income countries in Latin America and among the OECD countries. This of course is a result of the very low tax revenues prevailing in Chile during the period. While the total volume of public spending in Chile has been low, the vast majority of this spending has targeted social expenditures. In fact, about 66% of total government expenditures have consisted in social expenditures. Moreover, about 75% of all government expenditures have been directed to either social goods or pure public goods including public order and safety, and infrastructure.

Table 9. Government Expenditure by Function 1987-2009 (% of GDP)

	1987-1989	1990-1997	1998-2005	2006-2009
Government and Public Services	3.0	2.0	1.4	1.2
Defense and Economic Affairs	5.7	4.3	4.2	4.3
Public Order and Safety	1.0	1.0	1.3	1.4
Social Expenditure *	14.5	12.7	14.4	13.8
Total	24.2	20.0	21.3	20.7

\*Includes expenditures on education, health, housing, social protection, recreation and culture and environmental protection.

Source: DIPRES (2011) and own elaboration



Thus, the spending composition policies of the Concertación governments have emphasized the provision of goods that are complementary with private spending rather than substitute. As López and Galinato (2007) have shown this is precisely the role of government spending; to mitigate the effects of market failure or imperfections that lead the private sector to under invest in social goods (including education, health and welfare), R&D, the environment and in pure public goods by directing most government spending towards those areas.

While spending in R&D and environmental protection has been extremely low, at least the emphasis on social spending has been remarkable. This emphasis in spending on social goods together with the relatively rapid pace of economic growth during most of the period has been important in halving the rate of measured poverty. However, still more than 15% of the population is below the poverty line and about 4% is considered under the extreme poverty line. More importantly, a much larger fraction of the population is above the poverty line but still highly vulnerable, just slightly above the (very low) official poverty line (López and Miller, 2008).

Thus, the proportion of expenditures in social goods on total government expenditures in Chile is much higher than that in most other Latin American countries. According to the World Bank only in Uruguay this fraction is higher than in Chile. For Latin America as a whole, this share is about 48% well below that of 66% in Chile.

However, this picture radically changes when we consider social expenditures as a fraction of GDP instead of as a fraction of total government expenditures. Table 10 compares social spending as a share of GDP between Chile and countries of similar levels of development in Latin America, and the average spending in Latin America as a whole as well as the average for OECD countries for the period 2005-07. Total social spending in Chile at less than 12.4% of GDP was below the average for Latin America (14%) and well below levels prevailing in countries such as Argentina (21.5%), Brazil (23.7%) and Uruguay (20.7%). It was also much lower than the average for OECD

countries.<sup>14</sup> The discordance between social spending as shares of total public spending and as shares of GDP is of course the result of the fact that Chile's total government expenditures as a proportion of GDP are much lower than most other countries of similar levels of development.

Table 10. Comparing Social Public Expenditures as % of GDP (2005-2007)

	Total	Education	Health
Argentina	21.5	5.1	4.8
Brazil	23.7	4.9	4.5
<b>Chile</b>	<b>12.4</b>	<b>3.3</b>	<b>2.8</b>
Mexico	10.9	3.9	2.7
Uruguay	20.7	3.7	3.6
Latin America	14.0	4.6	3.1
OECD	19.5	4.6	5.8

Source: OECD online dataset and CEPALSTAT online dataset

Table 10 also shows that the government expenditures in education and health as a percentage of GDP are well below the levels prevailing in most middle and high income countries in the world. The Chilean government spent only 3.3% of GDP in education well below the 4.6% spent by OECD countries and much less than countries at similar levels of development in Latin America including Argentina (5.1%), Brazil (4.9%), Mexico (3.7%) and Uruguay (3.7%).

The gulf between Chile's public expenditures in health and comparable countries is even deeper than that of education. Public spending in health was only 2.8% of GDP in Chile, while the OECD average was more than twice that level at 5.8%. Moreover, Chile was well below the average level of public health spending in Latin America which was 3.1% of GDP, and also below all comparable countries in Latin America with the exception of Mexico.

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<sup>14</sup> However, apart from Mexico there are other countries in OECD such as Turkey that spend even a smaller fraction of GDP on social services.

## V. The Consequences

As shown in the previous section, government spending in education and health has been very low when compared to countries of similar levels of development. Moreover, the fact that Chile is much more unequal than most other middle income and developed countries implies that a much larger fraction of its population must rely on the state as the only source of education, health care and other social services.<sup>15</sup> That is, more unequal countries of similar levels of per capita income need to spend much more in the provision of public education and health services than countries that have a more egalitarian income distribution where a higher fraction of the population has the financial means to buy them from the private sector. Thus, the case of Chile is double dramatic: not only it spends less in public education and health services than countries of comparable levels of income but given that it is much more unequal than most of the comparable countries it has much greater needs than them.

### *Poor quality of education and health care*

The low level of expenditures on public education has been a factor explaining the poor quality of public education on which more than 90% of the student population depends directly. Despite the low government expenditures in health the public system appears to have provided relatively satisfactory services to those able to enroll in it but, according to a recent study by the Ministry of Health, more than 10% of the population does not have access to health care at all (Hoffmeister, 2010). A recent survey showed that among those able to access public health care more than 70% were satisfied with the service (OECD, 2011). However, this relatively high degree of satisfaction is not fully reflected in the health outcomes: While Chile's life expectancy is quite high -almost as high as the average for OECD countries- child mortality is one of the highest among the OECD countries, only lower than the child mortality rates prevailing in Mexico and Turkey.

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<sup>15</sup> In fact, more than 90% of the primary and secondary student population in Chile is enrolled in public schools despite that they provide a much inferior quality of education than private schools (Missoni and Solimano, 2010), more than 70% of the population must use the public health system despite the often long waiting lists for many pathologies, and 10% of the population simply has no access to any health care (Hoffmeister, 2010).

Much debate exist in Chile about whether the real problem with public education and health services is due to serious problems of efficiency, management, and organization of the public systems, or to simply insufficiency of resources. What is clear, however, is that as seen in the previous section the resources that the government devotes to public education and health care are extremely low as a fraction of GDP (and even lower per potential client of the public system) by comparison with OECD and even other middle income countries in Latin America.

While the government spends 3.4% of GDP in education the private sector spends only 20% less (about 2.7% of GDP) despite that the government must serve a student population that is 9 times larger than that enrolled in private education (Departamento de Estudios y Desarrollo, MINEDUC, 2006). The total expenditures per pupil in the public primary and secondary education system are less than one third of the expenditures per pupil in the private sector (Marcel and Tokman, 2005). According to the same study, at the tertiary level the gap between expenditures per student in the public and private universities is even larger. Expenditures per student in the public basic and secondary education system are estimated at about US\$1,200.

At such low levels of expenditures even if the public system is efficient the quality of the service cannot be good. Moreover, efficiency is not independent of the level of resources available. You cannot have good managers if you do not pay them well and provide good working conditions. You cannot have a motivated personnel if you cannot afford spending in training, better working conditions and so forth.

Insufficient public spending on education and health has meant that Chile has continued to suffer of low levels of human capital, a shortage of a variety of technical and scientific skills, as well as uneven health care conditions. The low level of public spending on education and particularly the low level of spending per pupil in the public system that enrolls more than 90% of the student population is reflected in the poor performance of Chilean students in international tests. According to a recent OECD comparison, Chile ranked penultimate among all OECD countries in the PISA literacy scale tests in 2009,

only above Mexico and below countries that have lower per capita incomes such as Turkey, Poland, Estonia, and others (OEC, 2011). Moreover, according to the same study, while the average score by Chilean students improved dramatically between the years 2000 and 2009, the inequality in scores (measured by the difference between the top and bottom deciles) increased the most among all OECD countries.

#### *The dynamics of factor endowments and production*

The poor quality of education for the vast majority of the students implies that the development of new productive skills as well as the process of adaptation and creation of new scientific and technological knowledge becomes more difficult. On the other hand the tax system which provides for low taxes on corporate profits and generous investment allowances and tax exemptions provide large incentives to investments in physical capital, especially for corporations that exploit natural resources as well as for other traditional industries. The combination of insufficient expenditures in human capital and generous tax policies that promote investment in physical capital has significant implications for the evolution of factor endowments. Factor endowments become increasingly more biased toward physical capital and against human capital. That is, the physical capital-to-human capital ratio of the economy tends to become artificially high.

In a small open economy as Chile there is a direct correlation between the structure of factor endowments and the patterns of specialization in production. Countries that fail to develop human skills and to adopt new technologies at the same rate as others are left behind and must increasingly specialize in physical capital-intensive and/or unskilled-intensive industries and, in the case of countries rich in natural resources as Chile, in natural resource-intensive industries as well.

In fact, certain technological and skill rankings available place Chile quite low among comparable countries. For example, an index developed by Archibugi and Coco (2003) using indicators such as patents, scientific articles, telecommunications, engineering enrolments and others, ranked Chile 41<sup>st</sup> among 120 countries considered. Chile's positioning was below countries of comparable or lower levels of per capita income such

as Argentina, Belarus, Latvia, Cyprus, Slovenia and others. Poor human capital has most likely been one of the key constraints for the development of new knowledge-intensive sectors in the economy.

*Increasing specialization in resource-intensive and physical capital-intensive sectors*

The systematic biases of the tax system in favor of the traditional industries demonstrated in the previous sections has meant that these traditional industries have been able to enjoy an unfair advantage over emerging sectors in attracting the scarcely available qualified human resources. The fact that environmentally dirty and resource-dependent sectors do not pay for environmental damages and for the natural resources that they extract and given that they tend to capture most of the large tax breaks available, has given these sectors an unfair advantage that is reflected in the markets for the scarcest factors of production, high skills. While traditional industries are resource and physical capital-intensive they also use high skills, including scientists, engineers and highly qualified operators. The artificial incentives that traditional industries enjoy imply that the marginal values of the high skilled people employed in these industries is magnified allowing the firms to pay higher wages than what infant high technology industries can afford. This makes it more difficult for new knowledge-intensive sectors to emerge.

This same process is in part responsible for the retardation of the development of the most skill intensive of all sectors: The academic and scientific research institutions (the knowledge-generating sectors) which produce new knowledge using almost as their sole input scientific and technological skills. This sector has faced not only the same general shortage of highly trained personnel that the rest of the economy has suffered, but also has encountered serious difficulties in competing with traditional productive sectors to retain the top scientists and engineers required to develop and disseminate new scientific knowledge that ultimately lead to practical innovations. To make matters worse, the public academic and research centers which are the ones producing most of the scientific learning and dissemination have been subjected to chronic budgetary insufficiencies as

part of the overall budgetary restrictions faced by the public education system.<sup>16</sup> These conditions may explain the relatively poor rankings of Chile in terms of development of new scientific patents and publications as shown by various international comparisons (Archibugi and Coco, 2003).

Thus, the traditional sectors are able to soak-up most of the little supply of technological and scientific skills available in the country leaving both the knowledge-intensive and knowledge-generating sectors at a highly disadvantageous position. This is one factor that explains the highly unbalanced patterns of growth of the Chilean economy that has been translated in an over grown physical capital and natural resource-intensive sector and underdeveloped knowledge-intensive and technology intensive service sectors.

#### *Unbalanced growth and economic development*

The unbalanced structure of production forces the economy to be ever more dependent on resource extraction and environmental degradation. Physical capital accumulation in these sectors is ultimately affected by diminishing marginal productivity as the scope for economies of scale is smaller than in knowledge-intensive industries. Moreover, the traditional sectors often cause negative inter-temporal resource spillovers (to the extent that a more intensive resource extraction leads to resource depletion affecting future production) and negative environmental externalities.

On the other hand government fiscal policy has contributed to smother the development of knowledge-based and knowledge-generating sectors. Unlike traditional resource and environment-dependent sectors, these under developed sectors produce positive spillovers on the rest of the economy and are often characterized by increasing returns to scale (Feldman, 1999; Fritsch and Franke, 2004). That is, the country foregoes the development of sectors that have the greatest potential for productivity growth and to induce innovation and that are often considered the prime engines of economic

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<sup>16</sup> A common complaint of academic administrators in Chile is their inability to retain top scientists which after a few years in academic tend to migrate to better paying jobs in the private sector. Some scientists stay in academic but spend a large part of their time as consultants with the private sector leaving them very little time to do real research.

development. Of even greater consequence is the underdevelopment of the knowledge-generation sectors: this perpetuates the undersupply of scientific and technological skills and hence causes a vicious circle leading to a model of development that is ever more dependent on traditional resource-intensive industries.

## **VI. Final remarks**

Fiscal policies that have prevailed over the last decades have contributed to create patterns of specialization that do not conduce to sustained productivity-based growth over the long run and instead lead to the underdevelopment of human capital. The human capital under development exacerbates inequality between the very rich and everyone else through both a direct effect associated with lower real wages as well as by inducing patterns of specialization where income is originated in large part on natural resources which are mostly concentrated in few hands.

Tax and expenditure policies have caused the knowledge-generation sectors (especially public universities and research centers) to lag behind as they not only face the general scarcity of highly qualified skills that are vital to their mission and budgetary insufficiency, but also must face the competition from the traditional productive sectors that are able to attract most of the scarce supply of high skills. This retards productivity growth over the long-run and reduces the future supply of human capital which, in turn, further limits the potential for development of knowledge-intensive productive and research sectors. Thus, a vicious cycle that tends to perpetuate both inequality and the dependence of the economy on resource and physical capital-intensive industries with a continuous disincentive to knowledge-intensive and knowledge-generating sectors emerges.

At the source of these shortcomings is the tax system which is insufficient, inefficient and inequitable. Insufficient because it does not yield enough revenues for the state to promote human capital development and to face poverty in a more comprehensive way; inefficient because it is highly unbalanced causing most of the tax burden to be concentrated in very few taxes while neglecting the use of the least distortion-prone tax



mechanisms available; inequitable because it forces the middle and low income groups to shoulder most of the tax burden while allowing the super rich to get away paying one of the lowest tax rates among middle income and advanced countries.

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