Fiscal policy in Chile: Hindering sustainable development by favoring myopic growth[1]

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ABSTRACT

We show that the tax system in Chile is insufficient, inefficient and inequitable. It does not yield enough public revenues to increase human capital and to combat poverty; it is unbalanced and neglects using the least distortion-prone taxes; it allows the super rich to pay very low taxes. The consequence is to artificially increase the capital intensity of the economy, to deepen its dependency on natural resource based/environmentally dirty industries and to delay the evolution towards a knowledge-based economy. All this has contributed to perpetuate a highly unequal distribution of wealth and to exacerbate environmental degradation.

Key words: tax system; public expenditure; economic growth; developing countries; physical-capital/human-capital ratio; primary industry specialization

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1. INTRODUCTION

The central hypothesis of this paper is that fiscal policy has been a key determinant of two salient features that have characterized the economic development of Chile during the 1990-2009 period[2]: 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, despite relative rapid growth, inequality in the distribution of income and wealth has remained among the highest in the world.[3]

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. Tax policies have also magnify the physical capital intensity of the economy by artificially sustaining the marginal productivity of physical capital through large capital tax expenditures and allowing high levels of income tax avoidance. Another mechanism of enhancing the productivity of physical capital and supporting investments has been the generous and arbitrary giveaway of a huge amount of natural and environmental resources (in principle belonging to all Chileans) to a few large corporate interests. Finally, the almost negligible taxes on the economic rents produced by natural capital have restricted fiscal revenues thus reducing the scope for public investments in human

[2] Four 'Concertación' governments, a left-center coalition, ruled the country during this period.
[3] Chile's income distribution is the 19th worse distribution in the world (UNDP 2009).

capital. This has meant a slow growth of human capital which, in turn, has been a factor behind the lack of growth of total factor productivity over the last 15 years.

On the other hand, fiscal expenditure, which has emphasized 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 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 to the incapacity of the tax system to generate enough fiscal revenues.[4] This has made government expenditures largely impotent to promote a decisive expansion of human capital among the vast majority of the population and to reduce inequality. The low levels of human capital formation due to insufficient fiscal expenditures on human capital, together with the massive tax incentives to invest in physical capital have, on the one hand, increase the natural resource and environmental intensity of the economy by expanding investment in the relatively low human capital intensive natural resource-based and dirty industries of the economy (mining, fishing, aquaculture, forestry, agriculture, hydropower, pulp and paper, etc.). Fiscal policies are thus in part responsible for the inability of the Chilean economy to evolve towards a more human capital intensive, knowledge-based and environmentally cleaner economy.

[4] 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.

(a) What is wrong with taxes in Chile?

We show below that the tax system in Chile is insufficient, inefficient and inequitable. It is 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, on the one hand, it is highly unbalanced causing most of the tax burden to be concentrated in few distorting 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.[5] 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. The large number of industries that intensively use or extract natural resources (mining, aquaculture, fisheries, hydroelectric, and forestry, among others) and/or are

[5] According to the UNDP's 2007 ranking, Chile's income distribution is more unequal than other middle income OECD countries such as Mexico in terms of both, Gini coefficient –in which Chile exhibits the 19th worse distribution in the world and Mexico the 30th – and the ratio between the richest 10% and the poorest 10% of the distribution – in which Chile is in the 21th place and Mexico in the 29th place UNDP, 2011).

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.

(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 economic efficiency and equity.

(i) 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.[6]

[6] As Cobham (2005) has put it, domestic revenue mobilization is key to sustainable development finance – only self-sufficiency will allow the development of fully-functioning states with flourishing systems of political representation and economies reflecting societies' expressed preferences in regard to, for example, inequality.

(ii) 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. Moreover, physical capital investment has remained attractive in low human capital intensive natural resource based and dirty sectors thanks to the large rents accruing to capital due to the country`s gracious cession of economic rents to foreign capitalists or the wealthiest people of the country, investing in these sectors. In addition, the so-called tax expenditures (legal tax loopholes) confer especial privileges to powerful established economic interests allowing them large income tax avoidance rates.

The resulting light corporate tax and low income tax revenues are compensated by a high tax burden on indirect consumption taxes, especially the value-added tax (VAT), which means that a high portion of the tax burden is 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 by reducing the disposable income of the poor and middle income groups and their ability to materialize investments in human capital which are highly profitably in social as well as private terms.

(iii) 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 all

tax mechanisms. This not only attempts against economic efficiency but also constitutes a 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. Moreover, this keeps returns to physical capital in natural resource and environment intensive industries artificially high relative to human capital which implies a negative incentive to investing in human capital, perpetuating both low returns to human capital and high inequality.

In terms of the economy's structure, 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, knowledge-based and human capital-intensive activities which have to pay market prices for all their inputs. Effectively, these policies amount to counter-sustainable 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 and sustainability.

(c) Faustian economics: myopic growth at the expense of long run sustainability

These fiscal policies, with such inbuilt distortions and strong incentives to make the economy more capital intensive and inequitable, may foster 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.

2. 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.

(a) 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 (2011a), one of the lowest shares among the richer economies of Latin America. The average share of the service sector in GDP

over the 2005-2009 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, Chile has an underdeveloped service sector and concomitantly an over-grown resource-based industrial sector and primary sectors.

Table 1
Latin America: Service Sector as % of GDP; 1985-2009

Country	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
Argentina	52,5	62,2	66,1	60,3	57,3
Costa Rica	55,3	56,8	56,9	61,4	63,2
Brazil	45,2	52,8	68,2	65,6	66,5
Mexico	56,9	65,5	66,1	66,2	60,9
AVERAGE	52,5	59,3	64,3	63,4	62,0
Chile	**51,8**	**52,4**	**55,2**	**55,9**	**51,7**
Bolivia	47,6	50,2	53	55,1	51,3
Colombia	45,4	48,5	56	60,8	58,2
Dominican Republic	61,7	52,8	54,2	58,6	61,2
Ecuador					58,4
Guatemala	54,2	55	56,3	56	58,1
Peru	57,4	62,7	60,9	61,4	57,1
Venezuela, RB	41,7	41,2	48,7	45,2	38,2
AVERAGE	51,3	51,7	54,9	56,2	54,6

Source: WDI, World Bank (2011) and own calculations.

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.[7] The participation of electronics, computers, robotics, nanotechnologies, gene-based technologies, information technology and other more knowledge-based and technologically sophisticated activities is practically negligible. Over the years, there are no clear indications of even a gradual reduction of the degree of dependence of the economy on primary sectors.

Table 2 shows the evolution of another indicator of the extreme dependence of the economy on 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 2005-2009 period, much higher than in any other previous five-year period since 1985. It was 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 2005-2009 saw very high international commodity prices but even in 2000-2004, 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).

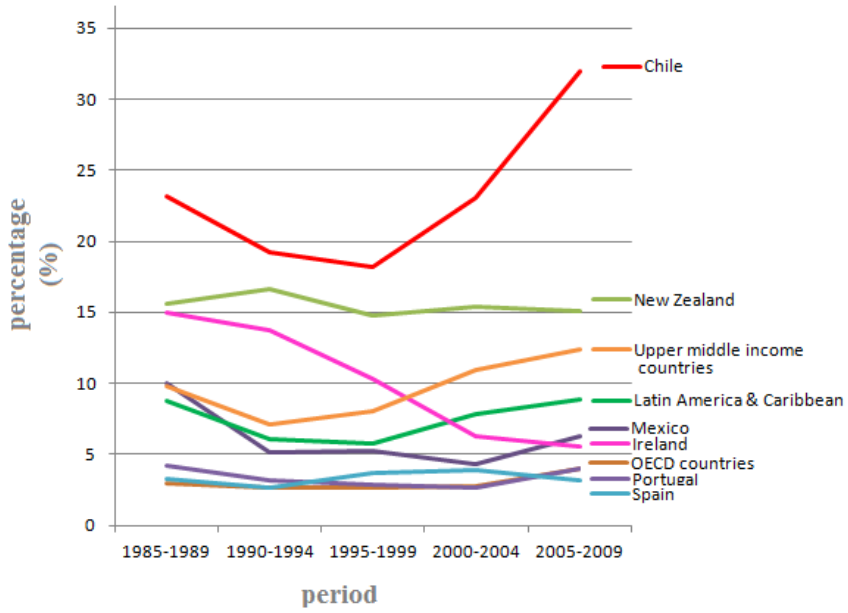
[7] Even the manufacturing sector is comprised mostly of activities such as food processing, leather, wood processing, pulp and paper, and mineral refining that are mainly based on the most basic elaboration of raw materials.

Table 2
Percentage of Exports of Primary Sectors[a] 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
Chile	**23.2**	**19.2**	**18.2**	**23.1**	**32.0**
Mexico	10.0	5.1	5.2	4.3	6.3
Latin America & Caribbean	**8.8**	**6.1**	**5.8**	**7.8**	**8.9**
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
Upper middle income countries	**9.8**	**7.1**	**8.0**	**10.9**	**12.4**

[a] Include agriculture raw materials, food, fuels and ores and mineral exports
Source: WDI, World Bank (2011) and own calculations.

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 1985-1989 and increased to 3.6 (32/8.9) in the period 2005-2009. Chile's share of exports of primary goods in total GDP was also well above the shares of OECD and other similar developing countries and developed countries, in the 2005-2009 period (Figure 1).



Source: own elaboration with WDI data, World Bank (2011)

Figure 1. Share of Exports of Primary Goods in Total GDP; middle income and developed countries; 1995-1989 to 2005-2009

(b) Inequality

Using household survey data (CASEN) for the year 2003, López & Miller (2007) concluded that, after 13 years of Concertacion governments, inequality in Chile 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 large as in 2003 although some progress was made in terms of reducing poverty.[8] The Gini

[8] 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

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 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)

Year	Poverty (%)	Extreme Poverty (%)	20/20 INDEX	10/40 INDEX	GINI COEF
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: CASEN (several years) surveys, MIDEPLAN, Social Division

Surely, the largest, by far, 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 & Torche (2008) estimate a Gini of 0.38 for the bottom 90% of the population, which reflects a relatively egalitarian distribution.[9] 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 & Bils, 2009; Attanasio & 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.

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".

[9] In most egalitarian countries Gini coefficients are between 0.25 and 0.30 (Sweden 0.25, Norway 0.258, Germany 0.283, Austria 0.291, Finland 0.291 and Montenegro 0.3) (UNDP, 2011).

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 & Smeeding, 2008). Unfortunately, there are no studies of distribution using income tax data in Chile.

Sanhueza & Mayer (2009) calculate that the share of the top 1% of the households over the 2005-2008 period was 9.6%.[10] 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 at. al., 2011).

To obtain a more accurate estimation of the income share accruing to the richest 1% of Chile, we use here the wealth estimates of the five Chilean super rich published annually by Forbes and calculate the annual income of a small but important fraction of the wealthiest households that are not represented in the household surveys. We estimate[11] that 17% of the country's total household income accrues to the 1% of the richest Chileans including the five super rich.[12] This places Chile second among 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% has been estimated at 17.6% (Atkinson

[10] They base their estimates on a large survey for Santiago which has been conducted over several decades using a consistent methodology.

[11] They base their estimates on a large survey for Santiago which has been conducted over several decades using a consistent methodology. A complete description of the methodology can be found in López and Figueroa (2011) or can be obtained from the authors.

[12] 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.

et al., 2011). Even these new estimates for Chile are likely to be lower bound values for the reasons explained in Appendix 1.

In fact, recent data on tax returns provided by the Chile´s tax office to the authors[13] show that the share of the richest 1% of of the taxpayers in the total income averaged about 19% over the period 2005-2010[14]. Thus, income distribution in Chile is much more concentrated among the top incomes than what conventional measures based on households surveys have suggested.

(c) 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 increased over the Concertación government periods. One way of checking this is to check whether or not the gap between the *average* and the *median* per capita household income has increased. 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. We thus compare the median household per capita income measured in the surveys with the average per capita GDP of the country.

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 median household income. In fact, over the last two decades there is no other OECD

[13] Personal official communication by Mr. Julio Pereira (of August 23rd, 2011), Director General of Servicio de Impuestos Internos (SII).

[14] Even the SII data is likely to underestimate the true share of the richest 1% because most capital gains are not taxable and hence are not reported. To the extent that the rich get a disproportional share of the capital gains, this may cause a significant underestimation of the true share.

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 per capita (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 the average per capita GDP. This large gap is one very succinct indicator of the inequality of economic growth. 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.[15] 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.

3. TAX POLICIES AND THE ELITES

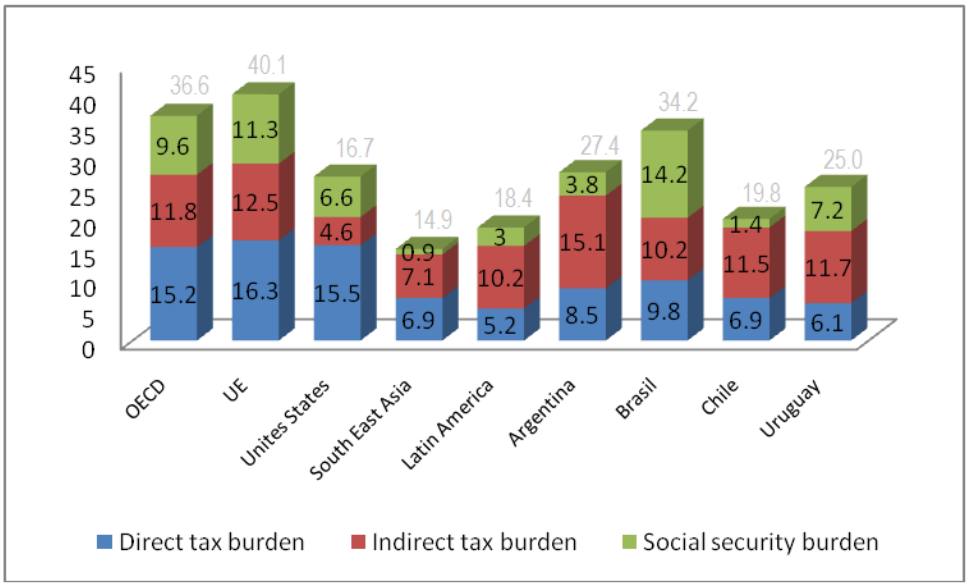
(a) Low tax revenues

Chile has the lowest tax revenue per dollar of GDP among all OECD countries. In 2006 Chile's total tax receipts amounted to 20% of GDP compared to an average of 36.3% for all OECD countries (Figure 2). As shown in Figure 2, even within Latin America, Chile's tax revenues as a proportion of GDP are much lower than that of the other most developed countries in the region, including Brazil (34%), Argentina (27%) and Uruguay (25%).[16] Chile is well below the international tax revenue norm given its per capita

[15] 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.

[16] In the UNDP's world Human Development Index ranking, Chile, Argentina, Uruguay and Brazil are ranked in places 45, 46, 52 and 72, respectively; and their 2008 per capita incomes were USD (PPP) 10,800, 8,236, 9,654 and 8,205, respectively (UNDP, 2010).

income (ECLAC, 2011). These low tax revenues impose a tight binding constraint on the scope of public expenditures (López & Miller, 2008).



Source: Gómez Sabaini & Martner (2010).

Figure 2. International Comparisons of the Tax Burden in 2006 (% of GDP)

By the early 1990s most countries in Latin America implemented tax reforms directed to increase tax revenues to finance new social programs. While Chile did 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 an increase of 19.4%, from 16.5% of GDP in 1990 to 19.7% in 2006. However, as Table 4 shows, this increase is well below the 49.3% average increase exhibited for the other 18 Latin American countries in the period. Thus, Chile has been one of the most conservative countries in terms of reforming its tax system to allow for

greater tax revenues, occupying the 15th place among 19 countries in terms of tax burden increases for the 1990-2006 period (Table 4).

Table 4
Tax Revenues of the Central Government in Latin American Countries

		1990 % of DP	2006 % of DP	Change 1990-2006 %
1	Bolivia	8,2	25,7	213,4
2	Venezaula	4,4	12,6	186,4
3	Nicaragua	9	21,3	136,7
4	Colombia	10,9	20,7	89,9
5	Dominican Republic	8,2	14,1	72,0
6	Argentina (1)	16,1	27,4	70,2
7	El Salvador	8,9	15	68,5
8	Guatemala	7,6	12,1	59,2
9	Paraguay	8,9	13,5	51,7
10	Peru	11,6	16,4	41,4
11	Ecuador	10,1	14,2	40,6
12	Brasil	26,4	34,2	29,5
13	Costa Rica (1)	16,9	21,4	26,6
14	Honduras (1) (2)	15,3	19,3	26,1
15	**Chile (1)**	**16,5**	**19,7**	**19,4**
16	Uruguay	22,4	25,6	14,3
17	Panama	14,7	15,9	8,2
18	Haiti	7,3	7,4	1,4
19	Mexico	12,6	11	-12,7
	Simple Average with Chile	12,4	18,3	47,2
	Simple Average without Chile	12,2	18,2	49,3

(1) Taxe revenues corresponds to the general government
(2) Data corresponding to 2005
Source: Gómez Sabaini & Martner (2010).

(b) 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 (Jorrat, 2009). This dependence on indirect taxation is very high by international

standards, being almost twice the average in OECD countries where it is 32% (see Figure 2). 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% is lower than that of 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 1990-1993 to an average of 32% in 2004-2006 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, over the last few years, Brazil's income tax revenues have been about 10% of GDP and Argentina's above 8%.

(c) Low corporate income taxes

Corporate income tax rates have also remained very low at 3.2% of GDP over the period 2004-2006, which is higher than the 2% shares observed over the early 1990s, 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, 2011b, 2006) this would yield an effective tax rate on profits equal to about 6.4%, well below Chile's legal corporate rate of 17%.

(d) Large tax expenditures or legal loopholes

According to the Chilean tax office, in 2004 tax expenditures were extremely high, reaching 4% of GDP and more than 20% of all tax revenues (SII, 2006). 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, since more than 80% of the income tax loopholes benefited the wealthiest 5% of the population, and 60% 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. The same study shows that VAT tax expenditures are 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 deferments especially directed to create incentives for investment in capital equipments and others are one of the most important components. Tax deferments are due mainly to exemptions to retained profits. However, part of the retained profits are never distributed because they correspond to "profits" generated by paper firms created to avoiding the high personal income marginal tax rate which reaches up to 40% for high incomes. These paper firms then become owners of durable consumption goods that are in fact used by the individuals.

As Table 5 shows, 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. Also, Chile's tax expenditures are among the highest in the group of comparable Latin-American countries considered in Table 5. 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 5
Tax Expenditures in Latin America
(% of GDP)

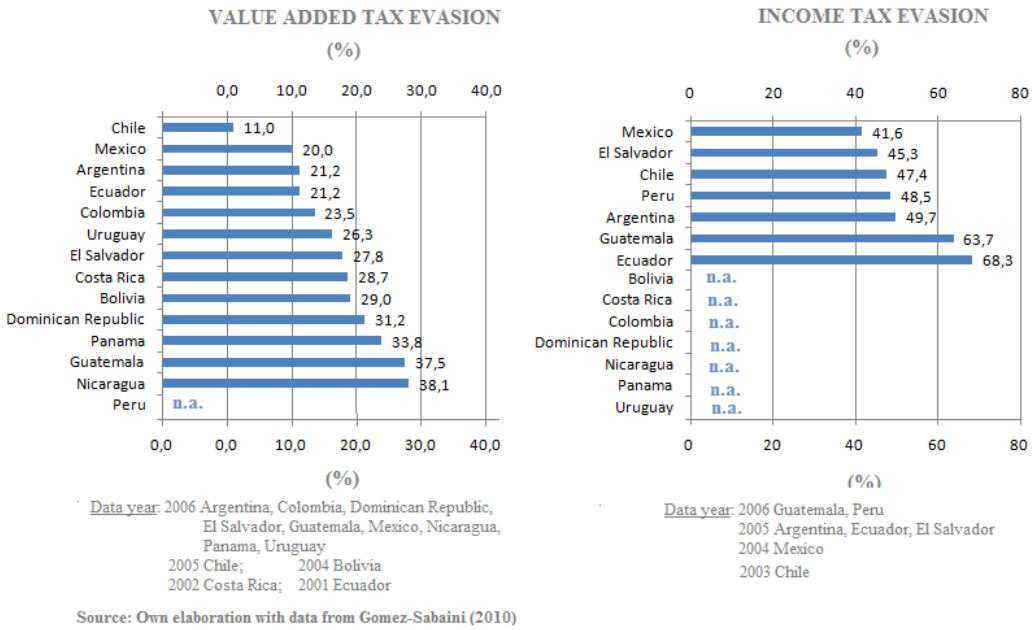
	2005	2007	2009
Argentina	2.21	2.2	2.08
Brazil	1.69	2.29	3.2
Chile	**4.38**	**4.88**	**3.96**
Colombia	3.7	3.52	N/A
Peru	2.07	2.22	1.81
Uruguay	4.75	4.59	5.61

Source: Villela (2011)

(e) 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, especially for the value added tax (VAT), but high for income taxes. In fact, the tax evasion rate for the VAT, estimated at about 11%, is the lowest in Latin America (Gómez 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 comparable to several countries in Latin America including Argentina (50%), Mexico (46%), Peru (51%) and El Salvador (51%) (Gómez Sabaini, 2010).

Figure 3 depicts the tax evasion rates for a sample of 14 countries in Latin America. The left panel shows that Chile has by far the highest efficiency in collecting value added taxes, exhibiting an evasion rate that is equal to about one half the evasion rate in the second most efficient country in the sample; however, at the same time, Chile shows a mediocre performance in collecting income taxes (see right panel).



Source: Own elaboration with data from Gomez-Sabaini (2010)

Figure 3. VAT and Income Tax Evasion Rates in Latin America

In 2005, the effective income tax revenues in Chile were about 5.9% of GDP. An evasion rate of 49.7% as estimated by Gómez Sabaini (2010) would imply a revenue loss of 5.8% of GDP. Using somewhat more detailed data, Jorratt (2009) estimated a lower value for income tax evasion, of the order of 4% of GDP. In any case, even the latter estimates indicate that income tax evasion is massive.

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 to under declaring their incomes. Therefore, 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 perplexing. As Figure 3 shows, in most countries in the Region for which there are data, the ratio of VAT/income tax evasion is about 1:2 and for some 1:3. But for Chile such ratio is almost 1:5. Such a high disparity may suggest that, for some reason, the Chilean governments must have made a conscious decision to place lower emphasis in collecting income taxes than VAT taxes. Moreover, Chile's ratio of 5:1 raises the key question of how a tax 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 – which is 40% – and the tax rate on profits – which has been around 17% for retained profits during most of the period considered. This difference is much greater in reality because of the many investment allowances and other legal loopholes that allow firms to reduce their effective profit tax rate to levels closer to 10%. High income individuals receiving non-wage income create paper firms allowing them to transform income into profits thus eluding taxes. Second, the tax office faces great restrictions in accessing bank account information, much greater than in other countries including Argentina, which has drastically limited the ability of the tax office to control income tax evasion (Fairfield, 2010).

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 the tax legal loopholes, especially the tax deferments and accelerated depreciation allowances, create additional incentives to investment in physical capital, but another significant part constitutes mainly pure tax losses. These not only represent massive losses of financial resources for the government but in addition they are resources that are appropriated mainly by the very rich, and therefore tend to deepen the country's high income inequality.

(f) Capital gains go mostly untaxed

Most capital gains are tax-exempted in Chile, 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 refrain from taxing both long and short term capital gains, since most of the OECD countries 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). In Latin America, on the other hand, 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.

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. Moreover, by refraining to tax capital gains Chile does not improve the international competitiveness of its financial markets.[17]

[17] 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

(g) Ineffective inheritance tax

The inheritance tax rate in Chile is 35%; however, 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.[18] 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. Taxing inheritances is often the last opportunity for society to recover part of the tax revenue losses that a defective income tax system and a lax enforcement have engendered. Moreover, it can also

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most middle and high income countries in the world do impose capital gain taxes renders this argument quite implausible.

[18] Moreover, double taxation may be criticized for making tax system more complicated than a single tax system which is equivalent, for example, revenue wise; however, double taxation can be better than single taxation since it is conceptually possible to design a double tax system that, ceteris paribus, is more efficient and/or more equitable than a single tax system.

represent a key opportunity for society to leveling highly uneven opportunities caused merely by the diversity of family backgrounds

(h) Negligible royalties on rents to natural resources

A large fraction of Chile's GDP consists of rents to natural resources. However, there are no official estimates of the rents generated by natural resources and calculating them is generally controversial, mostly due to the need to assume a "normal" rate of return to capital. Being aware of this, we have estimated natural resource rents generated by some of Chile's more important natural resource industries using a very conservative assumption about the pre-tax normal rate of return to capital of 20%.[19]

Our results indicate that the average annual rents generated by the natural resource industries included in our calculations amounts to USD 15,1 billion, for the period 2007-2010, or 10,1% of the country's average GDP of USD 150 billion for the same period (Table 6). However, our sample does not include many other important resource-based industries, such as the salmon industry and agriculture, for which there are no data. In fact, a more comprehensive measure of Chile's natural resource rents is provided by the World Bank public data bank which estimates them at 19,2% of GDP for the 2005-2009 period, or approximately USD 30 billion (World Bank, 2011c).

[19] In developed countries such as Canada the rate of return to capital used for official natural resource rents calculations is 10%.

Table 6
Chile: Average annual economic rents generated by natural resources
in selected industries; 2007-2010

		ANUAL RENTS (million USD)	SHARE OF CALCULATED RENTS (%)	SHARE OF GDP[a] (%)
FISHING	Private	200	1,3	0,1
FOREST	Private	750	5,0	0,5
MINING	Private non-copper	910	6,0	0,6
	Private copper	8.300	54,9	5,5
	Public copper	3.600	23,8	2,4
WATER	Private water/sanitation	160	1,1	0,1
	Private hydropower	1.200	7,9	0,8
	Total	**15.120**	**100,0**	**10,1**

a: average annual GDP of USD 150 billion for the period.
Source: own calculations based on COCHILCO, CODELCO and companies' annual reports.

The natural resources are a patrimony that belongs to all Chileans and yet the government has given rights of exploitation of all such resources for free to large foreign and domestic corporations until 2005 when a small royalty was charged to copper resources. 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 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.

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 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).

Moreover, a recent study showed that in the oil and gas sector, for the period of 1995-2002, Alaska captured on average every year 99% of the economic rents generated in the sector, Norway 88% and five Canadian Provinces 74% (Taylor et al. 2004). Other countries combine especial exploration and exploitation rights with actual royalties applied to sales values. As shown in Table 7, Norway charges a 50% special tax on profits above the normal rate of 28% applicable to all businesses in addition to significant exploitation and exploration rights. This contrasts with the case of Chile, where, since 2005, copper firms are taxed with the so called special tax on mining (IEM for its Spanish name), a modest 0,5% to 5% surcharge on declared profits, as the only intent to share part of the resource rents.[20]

Chile's tax policies are much more generous to the resource industries than the advanced countries. According to a study by Titelman (2010), the pre-tax average annual rate of return to the patrimony of the large private copper companies in Chile over the 2005-2010 period was in excess of 80% and the after-tax return was about 54%. These

[20] After the 2010 earthquake the tax surcharge has been increased to about 8% of declared profits.

figures suggest very large economic rents that the state has failed to capture. In addition, 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 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 economic 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.

Table 7
Natural Resources' Policies in Chile and Norway

POLICY	NORMAY			CHILE
	OIL & NATURAL GAS	**SAND/GRAVEL**	**HARD-ROCK[a]**	**COPPER**
Profit tax[b] **Special profit tax[c]**	28% 50% 78%	28% 0% 28%	28% 0% 28%	35% 0% 35%
Royalty		USD 1,3/ton[d]	USD 0,6/ton[e]	0,5-5%[f]
CO2 tax	oil: USD 14,3-168 gas: USD 19,1 (per tCO2e)	USD 19 (per tCO2e)	USD 19 (per tCO2e)	0
Reserve to be exploited by State	20-50% State Directed Financial Interest (SDFI). Under the SDFI arrangement, the state pays a share of all investment and operating costs in a project, corresponding to its direct interest. It also receives a corresponding proportion of production and other revenues on the same terms as other licensees.			33%
Exploration rights	substantial	substantial	substantial	Very low mining patent USD 1,65/ha[g]
Exploitation rights	substantial	substantial	substantial	Very low mining patent USD 8,25/ha[h]
Investment depreciation	For every USD invested in Norway the investor saves ¢ 93 on taxes			Accelerated depreciation

a: olivine, nephelinesyenite, quartz/quartzite, talc, feldspar/anorthosite, graphite, limestone, dolomite, etc.
b: applies to all businesses
c: this special tax replaced a royalty tax
d and e: NGU (2010)
f: increases with sales volune
g: as per 01/SEP/2011
h: as per 01/SEP/2011
Source: updated from Figueroa et al. (1998)

(i) Taxing part of the rents of natural resources: Revenue potential

Based on our estimate that natural resource rents constitute about 22% 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.[21] Using the average copper price of 2005-2009 as the "normal" reference price, the net pre-tax earnings of private copper firms are US$14 billion per annum (Titelman, 2010). 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 the state copper corporation, 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 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 about 15 % 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 40%

[21] 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.

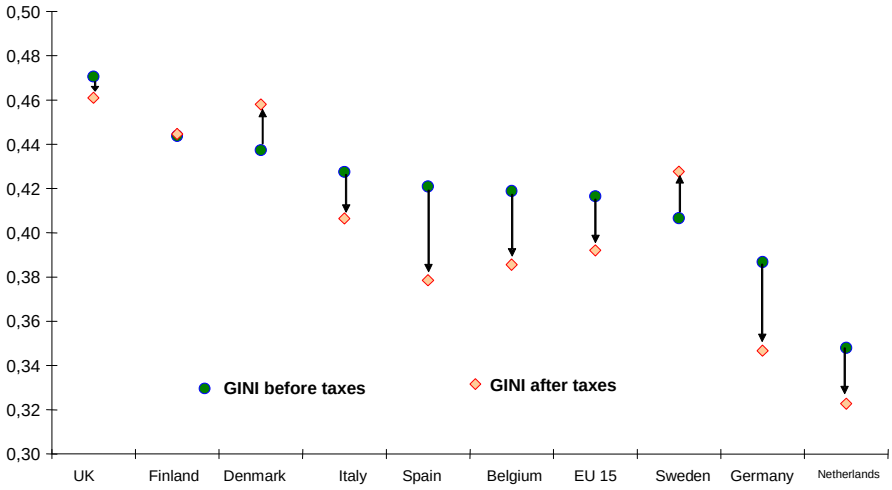
of these rents (or about 6 % of GDP) can be realistically subjected to the tax surcharge. We assume that the taxable resource sectors pay the average effective income tax rate of 6% that applies to the country as a whole yielding a base for the tax surcharge equal to 5.6% of GDP. Hence, a 25% royalty 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 or almost 4% of GDP. All this can be achieved by using well-designed mechanisms already successfully implemented by developed countries.

(i) 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 4). In Chile the opposite happens; the after-tax income Gini is slightly higher than the pre-tax one (Gómez-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 (Gómez-Sabaini, 2010). 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.



Source: Gomez-Sabaini 2010

Figure 4. Gini coefficients before and after taxes in OECD countries

(j) 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 very high value-added taxes while it applies very low effective rates to corporations and exempts capital gains almost completely.[22]

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.[23] 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.[24]

Value-added taxes are often justified by appealing to the most naive textbook models of perfect markets. Value-added taxes in the more realistic second best scenario

[22] 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.

[23] 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 & Montiel, 1989) and even in rich ones (Attanasio et. al., 2008; Grant, 2007; Jappelli, 1990).

[24] The VAT triggers an income and a substitution effect. In fact, the very high 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.

where taxes coexist with capital market imperfections they 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.

4. PUBLIC SPENDING HAS CONTRIBUTED TO REDUCE POVERTY BUT NOT INEQUALITY

As a result of the very low tax revenues prevailing in Chile during the Concertación governments, public spending has been meager. The share of total public spending in GDP was consistently below 22% over the twenty years of these governments (Table 8). This is one of the lowest spending ratios among the middle income countries in Latin America and among the OECD countries. 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 8
Chile: 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 emphasized the provision of goods that are complementary with private spending rather than substitute. As López & 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 which, 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 & 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 9 shows that, for the period 2005-2007, total social spending in Chile at 12.4% of GDP was lower than the average for Latin America (14%), much lower than levels exhibited by the richer countries in the region such as Argentina (21.5%), Brazil (23.7%) and Uruguay (20.7%), and also much lower than the average for OECD countries.[25] 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 9
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
Chile	**12.4**	**3.3**	**2.8**
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

[25] However, apart from Mexico there are other countries in OECD such as Turkey that spend even a smaller fraction of GDP on social services.

Table 9 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.

5. THE CONSEQUENCES

As shown above, government investment in education and health has been very low 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.[26] That is, more unequal countries of

[26] 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 & 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).

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. Moreover, since these deficiencies affect the two main pillars of human capital creation – education and health – the country has applied a permanent and powerful brake on productivity increases and, therefore, hence has affected its long term potential for economic development.

(a) Poor quality of education and health care

The low expenditures on public education is 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 (more than 10% of the population does not have access to health care at all (Hoffmeister, 2010)).[27]

Much debate exist in Chile about whether the real problem with public education and health services is due to problems of efficiency, management, and organization of the public systems, or to 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

[27] A recent survey showed that among those able to access public health care more than 70% were satisfied with the service (OECD, 2011b). 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.

health care are very 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 (MINEDUC, 2006). The total expenditures per pupil in the public primary and secondary education system are less than one fifth of the expenditures per pupil in the private sector; and at the tertiary level the gap between expenditures per student in the public and private universities is even larger (Marcel and Tokman, 2005).

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.[28]

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. 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, 2011a). Moreover, according to the same study, while the average score by

[28] The public system cannot have good managers if it does not pay them well and provide good working conditions. It cannot have a motivated personnel if it cannot afford spending in training, better working conditions and so forth.

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. Therefore, in the last decade, the education system may have contributed to perpetuate the basic conditions generating inequality.

(b) 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 provides 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 like 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 & Coco (2003) using indicators such as patents, scientific articles, telecommunications, engineering enrolments and others, ranked Chile 41st 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.

(c) Increasing specialization in resource-intensive and physical capital-intensive sectors

The systematic biases of the tax system in favor of the traditional (physical capital, natural resource and environment intensive) 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 or pay only partially 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.[29] 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 & Coco, 2003).

Moreover, the slow expansion of human capital and the large degradation of the natural capital that this pattern development has caused may explain the debacle in total factor productivity and the large decrease of the productivity of new investments documented by several studies (Di Bella & Cerisola, 2011). In fact, as Figure 5 shows,

[29] 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.

Chile's total factor productivity has consistently declined at alarming rates over the last 15 years.

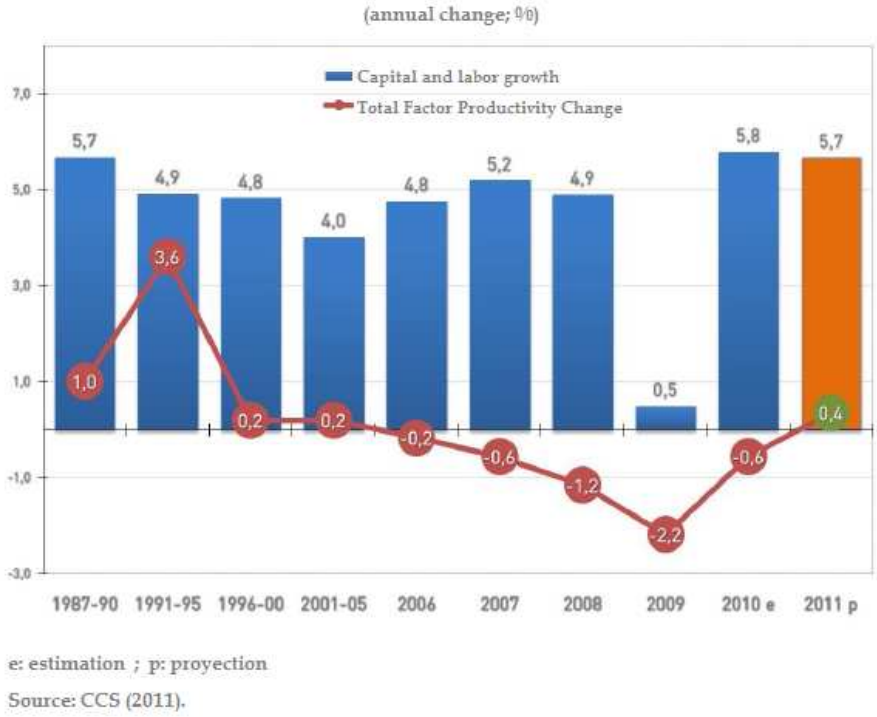


Figure 5. Chile: Productive Factor Endowments versus Total Factor Productivity; 1987-90/2011

Thus, the traditional sectors are able to soak-up most of the scarce 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.

(d) 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 & 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 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.

6. 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. Human capital underdevelopment, in turn, 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 rents 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 emerges 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.

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