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Top Income Shares, Business Profits, and Effective Tax Rates in Contemporary Chile

Tasha Fairfield and Michel Jorratt

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Tasha Fairfield and Michel Jorratt

Summary

This paper contributes to the burgeoning research on inequality and top incomes around the globe by presenting the first available estimates of top income shares and effective income tax rates in contemporary Chile based on analysis of anonymous income tax return microdata. We pay special attention to business income, which dominates at the top of the distribution. Our analysis includes not only distributed profits, but also the large proportion of accrued profits retained by firms. Our most conservative estimate of the income share received by the top 1 per cent of Chileans, constructed directly from income reported to the tax agency, is 15 per cent for 2005 and 2009 – the fifth highest share reported in the top incomes literature. When distributed profits are adjusted for widespread under-reporting, we estimate that the top 1 per cent share increases to roughly 22 per cent. When distributed profits are replaced by accrued profits in our definition of income, we obtain 19 per cent as our lowest estimate for the top 1 per cent share. Despite this impressive income concentration, the rich in Chile pay modest effective income tax rates. The top 1 per cent pay an average effective rate of 16-17 per cent when distributed profits are not adjusted for under-reporting, and less than 9 per cent when distributed profits are adjusted to national accounts. When we include corporate income tax and accrued profits in our analysis (without adjustments), the effective tax burden for the top 1 per cent is 16 per cent.

Keywords: top incomes; inequality; taxation; effective tax rates; Chile; Latin America.

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Contents

	Summary	3
	Acknowledgements	6
	Acronyms	6
	Introduction	7
1	Data and methods	10
	1.1 Income and profits	11
	1.2 Adjusting for undeclared income	13
	1.3 Income definitions for analysing top shares	15
	1.4 Ranking taxpayers	16
	1.5 Control incomes	17
	1.6 Control populations	18
2	Top income shares and compositions	18
3	Effective tax rates	30
4	Conclusion	34
	Appendices	
	Appendix 1 Adjusting for undeclared income	36
	Appendix 2 Assessing the effects of ranking shifts on income shares	38
	Appendix 3 Composition of top incomes, 2005 (2009)	40
	Appendix 4 Top incomes: shares within shares, 2005 (2009)	41
	Appendix 5 Average incomes and income thresholds	42
	Appendix 6 Effective tax rates, top 1%, 2005 (excluding corporate tax on retained profits)	44
	References	45
	Tables	
	Table 1.1 Dataset rankings and corresponding incomes	17
	Table 1.2 Control incomes, % GDP	18
	Table 1.3 Population and tax returns	18
	Table 2.1 Income shares with distributed profits only	20
	Table 2.2 Income shares	23
	Table 2.3 Income shares with distributed vs. accrued profits by different rankings, 2005 (2009)	26
	Table 3.1 Chile's individual income tax rate structure, 2005 (2009)	30
	Table 3.2 Average effective tax rates (%) (excluding corporate tax on retained profits)	31
	Table 3.3 Shares of total income tax revenue collected from top fractiles (excluding corporate tax on retained profits)	33
	Table 3.4 Effective tax rates (%), including corporate tax on retained profits	33
	Table 3.5 Shares of total income tax revenue collected from top fractiles, including corporate tax on retained profits	34

Figures

Figure 2.1	Income shares (%), excluding capital gains	21
Figure 2.2	Lorenz curves, 2005	22
Figure 2.3	Lorenz curves, including retained profits, 2005	24
Figure 2.4	Shares (%), including retained profits (Chile) or capital gains	25
Figure 2.5	Top income compositions, 2005 (left bar) and 2009 (right bar)	28

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Acronyms

AFP	Administradora de Fondos de Pensiones (Pension Plan Administrator)
CASEN	Encuesta de Caracterización Socioeconómica Nacional (National Socioeconomic Survey)
GDP	Gross Domestic Product
IGC	Impuesto global complementario (complementary global income tax)
IPC	Impuesto de primera categoría (first category income tax)
ISC	Impuesto de segunda categoría (second category income tax)
SII	Servicio de Impuestos Internos (Chilean Tax Service)
UF	Unidad de Fomento (an inflation-adjusted accounting unit used in Chile)
UTA	Unidad Tributaria Annual (Annual Tax Unit)

Introduction

Inequality is an increasingly salient issue around the globe for scholars, the development community, policymakers, and citizens at large. Many economists have argued that inequality is detrimental for development: inequality may both interfere with poverty reduction and hinder economic growth.¹ A growing literature in political science examines whether inequality undermines democratic stability, and to what extent democracy facilitates redistribution. Some argue that inequality hinders democratisation,² or that failure to improve equity and the material well-being of the majority cultivates disillusionment with democracy and may foster political violence and the rise of semi-authoritarian rulers.³ Others maintain that highly unequal democracies may be quite stable, yet material inequality engenders political inequality, allowing the super-rich to block public policies like progressive taxation that might erode their fortunes even if these policies are in the majority interest.⁴ Meanwhile, citizens have taken to the streets in several instances to voice equity-related demands in the context of the 'Occupy' and '99%' movements. The Chilean student movement, which captured the world's attention in 2011, brought the issue of inequality to the forefront of public debate by demanding that the government increase taxation of Chile's wealthy economic elites to fund massive investment in public education.⁵

To date, academic research and public debates on inequality, redistribution, and the influence of economic elites in Chile and Latin America more broadly⁶ have been constrained by inadequate empirical information on top income shares and effective tax rates paid by the wealthiest citizens. Latin America has long been recognised as the region characterised by the world's most extreme levels of inequality. Estimates based on household surveys indicate that the top decile's share of national income ranged from 34 per cent to 45 per cent (CEPAL 2012).⁷ Meanwhile, Latin America's economic elites are undertaxed compared to their counterparts in other countries; income tax revenue as a percentage of Gross Domestic Product (GDP) in the region tends to fall well below values predicted by worldwide regressions based on per capita GDP (Perry et al. 2006: 95; Jiménez et al. 2010: 26). Tax incidence studies suggest that the ratio of taxes paid to income earned for the top income quintiles or deciles are low (Goñi et al. 2011: 1563). Yet, by and large we lack accurate information on income shares and effective tax rates within the ranks of the top decile, which aggregates individuals of disparate means, from professionals culturally viewed as members of the 'middle class' to extraordinarily wealthy entrepreneurs who dominate business ownership. The household surveys employed in most income distribution and tax incidence studies fail to capture information about the very rich for two main reasons. First, the rich tend to be under-represented in, if not entirely absent from, national survey samples because they constitute such a tiny group and because sampling

¹ For example, Alesina and Rodrik (1994); Birdsall and Londoño (1997); World Bank (2004); Ferreira and Ravallion (2008). Some question this assessment (Forbes 2000; Banerjee and Duflo 2003); however, according to the World Bank (2004: 1.16): 'it is probably fair to say that the balance of academic opinion leans toward the view that high levels of inequality in incomes or in assets are causally related to lower rates of growth in mean incomes'.

² Acemoglu and Robinson (2006).

³ For example, Diaz-Cayeros and Magaloni (2009); Karl (2005); World Bank (2004). Indeed, public opinion polls in Latin America have found widespread discontent with high levels of inequality (Corporación Latinobarómetro 2009: 42).

⁴ Winters (2011). For variants on this theme, see Jacobs and Soss (2010) and Hacker and Pierson (2010). For an unusual case where elites were too weak to influence tax policy, see Fairfield (2011).

⁵ See Fairfield and Garay (2013).

⁶ On economic elites and tax policy in Latin America, see Fairfield (2010, 2013), Schneider (2012), and Flores-Macías (forthcoming).

⁷ Excluding Uruguay (30%), a historically more equitable Latin American country, and Venezuela (29%).

procedures are not designed to include them. Second, even if top income earners are included in survey samples, they are much more likely than average citizens to refuse to participate.⁸

Atkinson and Piketty (2009, 2010) and their collaborators have demonstrated that income tax return data provides far more accurate information than household surveys on top income shares and effective tax rates, even where under-reporting is widespread. To date, however, only a handful of Latin American countries have been analysed in this literature, given the difficulty of obtaining detailed income tax return data in the region. Many countries have refused to provide anonymous income tax return data to academic researchers. A few countries make some limited information publicly available. Argentina publishes statistics for the tiny minority (approximately 3 per cent of adults) who are required to file income tax declarations.⁹ The Chilean tax agency has also recently begun to publish some income tax return data.¹⁰ However, given the high level of aggregation, as well as top-coding problems that are characteristic of published tax agency data, it can provide at best an incomplete characterisation of the fortunes of the very rich. To our knowledge, Colombia is the only Latin American country that has provided extended panel microdata for analysis of inequality and tax incidence (Alvaredo and Londoño Vélez 2013).

This paper aims to contribute to scholarly research and public debates on inequality and redistribution, and to help broaden the scope of developing countries analysed in the top incomes literature, by presenting top income shares and effective tax rates estimated from original new datasets that we compiled with the generous cooperation of Chile's Servicio de Impuestos Internos (SII). Whereas most studies in the top incomes literature rely on tabulated tax return data or samples of individual tax returns, we obtained access to the full universe of individual Chilean tax returns for 2005 and 2009. Our datasets are extremely fine-grained, aggregating by units of only eleven taxpayers. We are therefore able to report income shares and effective tax rates for top income fractiles directly, without recourse to fitting techniques. Likewise, we are able to characterise the income distribution and effective tax rate curves within the top decile directly. By contrast, Chilean tax agency data provided for Agostini et al.'s (2012) tax reform simulations aggregated taxpayers into brackets of 7,422 individuals, and the publicly available tax agency statistics analysed by López et al. (2013) aggregate taxpayers into only eight brackets according to the marginal tax rate schedule; the top bracket contains 13,000 to 24,000 taxpayers (depending on the year). This paper therefore provides the most accurate description of top income shares and tax rates yet available for contemporary Chile, a country of special interest in Latin America given its reputation for successful poverty reduction, economic growth and political stability, which have nevertheless coexisted with high levels of inequality and recent eruptions of popular discontent. Moreover, this paper is only the second of its kind to provide microdata-based estimates of income shares and tax burdens in Latin America.¹¹ Access to tax return data has long been a highly sensitive issue in Chile, given restrictive interpretations of confidentiality and privacy laws.

A novel feature of this paper is our analysis of not only business profits that are formally distributed to individual taxpayers, but also the very large proportion of profits that are perpetually reinvested in Chilean firms. We thus contribute to emerging research on income from wealth and capital – whether realised or not (Atkinson 2009b; Atkinson and Piketty 2010;

⁸ Atkinson et al. (2010: 669); Alvaredo (2007); Székeley and Hilgert (1999); Groves and Couper (1998).

⁹ Argentina's very narrow coverage is partly due to the fact that pure wage earners are not required to file declarations; their taxes are automatically withheld by employers. Alvaredo's (2010) top income share analysis makes use of this tabulated data.

¹⁰ López et al. (2013) present some estimates using this data.

¹¹ See also Alvaredo and Londoño Vélez (2013).

Smeeding and Thompson 2010; Roine and Walderström 2011). Capital income has long been recognised as playing a potentially important role in augmenting inequality, but it is rarely analysed given data limitations.¹² We imputed accrued profits to Chilean taxpayers using ownership shares calculated from information that businesses report to the tax agency on profits distributed among their shareholders.

Estimating the distribution of retained profits in Chile is critical because the country has a unique integrated income tax system that creates strong incentives for business owners to avoid formally withdrawing profits. Chile's corporate tax serves as a withholding (advance payment) against personal income taxes that owners are required to pay when they receive distributed profits. Corporate taxes already collected at the firm level are credited against the recipient's personal income taxes when dividends are distributed, so that profits are not double-taxed. However, distributed profits enter into the personal income tax base, and personal income is subject to progressive marginal tax rates up to 40 per cent. Because the corporate tax rate (17 per cent between 2004 and 2010; currently 20 per cent) is much lower than the top personal income tax rate (40 per cent), business owners leave the majority of their profits in the firm. According to tax agency figures, on average only one-third of profits are distributed annually (Jorratt 2012: 42). In addition, independent professionals commonly incorporate their earnings to avoid paying the much higher personal income tax rates. Retained profits and incorporated income are not always channelled into productive investments. Owners find both legal and illegal ways to consume profits without declaring dividends and hence without paying the corresponding individual income tax: for example, luxury vehicles for personal use may be registered to the firm (avoidance),¹³ or distributed profits may simply be omitted from tax declarations (evasion). Income tax evasion is estimated at 46 per cent, essentially all of which is associated with distributed profits and dividends (Jorratt 2009: 7).¹⁴ Ignoring retained profits in income distribution studies therefore significantly underestimates the vast material resources at the disposal of Chile's economic elites.

This paper further contributes to the small but growing literature that analyses not only top income shares, but also effective tax rates paid by the very rich (Piketty and Saez 2006; Bach et al. 2012; Alvaredo and Londoño Vélez 2013). Such analysis can play an important role in informing policy debates and grounding scholarly analysis of redistributive politics and the ability of the super-rich to defend their material interests (Hacker and Pierson 2010; Winters 2011). Moreover, we include corporate tax in our estimates of effective tax rates. The most widely referenced incidence study for Chile excludes profits retained by firms from the definition of individual income, and ignores the corresponding corporate taxes because they are a credit against future personal income tax payments (Engel et al. 1999: 159). However, corporate tax is not only an important source of revenue in Chile (43-50 per cent of total income taxes in recent years),¹⁵ it is in practice the only tax ever paid on corporate profits given widespread personal income tax avoidance and evasion (Cantallopts et al. 2007). Corporate taxation in Chile therefore can have important implications for both tax capacity and tax equity. Agostini et al. (2012) embrace this view as well; they provide evidence that the tax deferral for capital income

¹² Among other problems, many forms of capital income are tax-exempt, especially in developing countries, and hence are not reported on tax returns. Only a handful of studies have analysed the contribution of capital gains to top income shares. On the serious nature of the problem of missing capital income and top income shares, see Atkinson et al. (2010).

¹³ Another frequent avoidance mechanism entails using capital gains to withdraw profits. An owner can buy a property, sell it at a higher price to a business in which he or she owns shares, and pay no tax on the capital gain.

¹⁴ It is difficult for the tax agency to control under-declaration of this type since most businesses are organised as partnerships rather than publicly-traded corporations, and the tax agency therefore cannot obtain information on distributed profits from a disinterested third party.

¹⁵ Authors' calculations using SII, Serie Ingresos Tributarios Consolidados, 2009-2011, Santiago, Chile
<http://www.sii.cl/aprenda_sobre_impuestos/estudios/estadistribu/ingresos_tributarios_new.htm>

(i.e. profits do not enter the individual income tax base until they are distributed) creates significant horizontal inequity and reduces the progressivity of the income tax system. However, their analysis is limited by lack of access to the business tax forms that we obtained in order to estimate ownership shares.¹⁶

Our results indicate that the concentration of income and profits in Chile is among the highest currently estimated in the top incomes literature, although uncertainty associated with the distribution of undeclared distributed profits and the lack of comparable studies analysing retained profits prevent us from confidently ranking Chile among the other income inequality leaders (the US, Argentina, Colombia and South Africa). When only distributed profits are included in the income definition, we conservatively estimate that the top 1 per cent of adults receive an income share of 15 per cent, while the top 0.01 per cent receive 1 per cent. These shares increase substantially when we adjust distributed profits for under-declaration. Depending on the assumptions employed to impute undeclared profits, estimated shares range from 22-24 per cent for the top 1 per cent, and 1.6-5.9 per cent for the top 0.01 per cent. When the income definition includes accrued profits instead of distributed profits, the top 1 per cent shares range from 19 per cent (unadjusted) to 32-33 per cent (adjusted for under-reporting), while the top 0.01 per cent shares rise to between 4 per cent (unadjusted) and 6-7 per cent (adjusted for under-reporting). Despite this impressive concentration of income, effective income tax rates paid by the richest Chileans are quite modest. The top 1 per cent pay an average effective rate of 16-17 per cent when distributed profits are not adjusted for under-reporting, and less than 9 per cent when distributed profits are adjusted to national accounts. Our estimated average effective tax rates including the corporate tax in the numerator and including accrued profits in the income denominator are 16 per cent for the top 1 per cent and 17 per cent for the top 0.01 per cent. Effective rates for the US that include the corporate tax are 1.5 to 2 times higher (Piketty and Saez 2006); to our knowledge, comparable analyses are not available for other countries.

1 Data and methods

Whereas multiple previous requests had been denied, in May 2011 Chile's tax agency (SII) graciously agreed to provide us with access to confidential, anonymised individual tax return records from 2005 and 2009 within the tax agency's premises. Compiling our datasets required detailed knowledge about the tax agency's information systems and filing forms, and extensive work on the tax agency's computers, as well as a lengthy process for obtaining authorisation for the project. The government has subsequently tightened restrictions on accessing tax return data.

By Latin American standards, our datasets are remarkably comprehensive in terms of the number of individuals they include. Income taxes in Latin America generally exclude the majority of the population: given high levels of poverty and inequality, most adults make less than the minimum taxable income. In Chile, approximately 82 per cent of individuals earn less than the taxable threshold (Agostini et al. 2012). Nevertheless, individuals registered with the SII comprised 63 per cent of adults in 2005 and 67 per cent in 2009 (many of whom did not receive enough income to owe taxes). Our datasets contain information on all reported income and

¹⁶ Agostini et al.'s (2012) analysis of retained profits relies on the Caracterización Socioeconómica Nacional (CASEN) household income survey, which almost certainly does not provide accurate information on capital income and business ownership for wealthy individuals.

taxes paid by these individuals. This section describes the key components of our datasets and the methods used to compile them.

1.1 Income and profits

Our datasets record income in eight categories: pensions (aggregated private and public), wages, independent work, interest earnings, rent from real estate, taxable capital gains, dividends and distributed profits, and accrued net business profits. Information on the first seven categories comes directly from forms filed by taxpayers, cross-checked against forms filed by withholding or reporting agents whenever possible (for example, employers in the case of wages and banks in the case of interest earnings). To reconstruct total, pre-tax wage income, deductions for mandatory health insurance payments and contributions to private pension funds were added back to the declared taxable amounts.¹⁷

The interest income category includes inflation-adjusted earnings from bank accounts and deposits in other financial institutions, as well as capital gains from mutual funds and investment funds, capital gains classified as habitual (e.g. stocks bought and sold within one year), and interest earned on voluntary pension savings (above the minimum contributions required by law). Only real interest earnings are taxable in Chile; taxpayers report losses associated with interest rates below inflation or negative habitual capital gains up to the point that they cancel out gains in this category. However, interest earnings entries in our datasets are occasionally negative, because information was included on taxpayers' inflation-driven losses as reported by financial institutions.¹⁸ When estimating income shares, we set negative net interest earnings entries to zero.¹⁹

Non-habitual capital gains are classified under the separate capital gains income category. As with interest earnings, reported capital gains are either positive or zero. Like most developing countries, Chile taxes only specific types of non-habitual capital gains. Capital gains from selling real estate and stocks in publicly-traded corporations are tax-exempt and hence are not reported to the tax agency. Capital gains received by businesses, which account for the majority of declared capital gains in Chile, were imputed to individual taxpayers following the same procedure used to impute retained profits, which is described later in this section.²⁰ Like capital gains, most forms of rental income are tax-exempt.²¹

We exclude untaxed forms of interest, capital gains, and rent from our income definitions for lack of adequate distributional information, as is the norm in the top incomes literature.²² Despite the difficulties that relying on income definitions dictated by country-specific tax systems creates for cross-national comparisons, this approach is largely inevitable for analyses employing tax agency data, and the associated problems are generally sidestepped in the literature.

¹⁷ These amounts are not explicitly declared in the tax data, but they can be calculated directly from the statutory contribution rates (7% of gross salary for health, with a maximum of 4.2 UF, and 12.7% for pensions with a maximum of 7.38 UF (one UF equalled 17,975 pesos in 2005 and 20,943 pesos in 2009)). The only source of uncertainty arises from the fact that commissions charged by pension funds vary; the percentage cited incorporates the average commission.

¹⁸ We have no such information on net negative capital losses, either for those classified as interest or those reported under the separate capital gains category.

¹⁹ This procedure likely underestimates taxable interest income, since one taxpayer's net inflationary losses may negate positive interest earned by another taxpayer within the same aggregated row of our dataset.

²⁰ Imputed capital gains from businesses are aggregated with capital gains received directly by individuals in our datasets.

²¹ For example, owners may rent apartments under a specified square footage tax-free.

²² Atkinson et al. (2010: 672) observe: 'In all cases, the estimates follow the tax law, rather than a "preferred" definition of income'. For example, Piketty and Saez (2006) ignore non-taxed sources of interest income in their analysis of the US, and Alvaredo (2010) ignores all interest income in Argentina, which is tax-exempt.

Accrued profits – a unique feature of our datasets – were estimated through a multi-stage procedure. First, tax returns were used to reconstruct businesses' profits from the more limited definition of taxable profits declared for the fiscal year. Tax return forms provided direct information on losses accumulated from previous years, which were added back to declared taxable profits to account for Chile's unlimited loss carry-forward provisions. Allowances for accelerated depreciation should also be added back to declared taxable profits; however, tax forms do not contain sufficient information to make this correction.²³

In the second stage, accrued profits were imputed to individual taxpayers using information filed by businesses on the profits distributed to each of their owners during the two years in question (2005 and 2009). Ownership shares were calculated as the ratio of profits received by a particular owner to the total profits distributed by the firm during the year in question.²⁴ Accrued profits were then allocated in proportion to these ownership shares through an iterative assignment process. Multiple iterations were necessary to trace interlocking business ownership down to the level of individual taxpayers.²⁵ Through this procedure, 40 per cent (37 per cent) of the total accrued profits for 2005 (2009) were imputed to Chilean taxpayers, 28 per cent (33 per cent) to foreign owners, and 2 per cent (2 per cent) to funds managed by pension and mutual administrators. Profits imputed to foreigners are omitted from our dataset; profits accrued to pension funds are discussed below.

We lack ownership information for a sizeable number of businesses that did not report any distributed profits in either 2005 or 2009. Profits accrued to these firms constituted approximately 30 per cent (28 per cent) of the total in 2005 (2009). We employ three alternative approaches for handling these profits. The first is simply to omit them from our datasets. The second entails imputing these profits based on the distribution of the accrued profits for which we do have ownership information. The third imputes the residual accrued profits in proportion to the distribution of taxpayers' declared distributed profits. This third approach assumes that all of the firms that did not distribute profits belong to individuals who own other businesses that did distribute profits. While all of these approaches are somewhat ad hoc, they provide a rough estimate of the uncertainty surrounding the distribution of accrued profits. All three approaches assume that the information we have fully identifies members of the Chilean business class. It should be noted that we impute accrued net losses in the same manner as accrued net profits;²⁶ as such, our datasets contain rows with large negative entries in this income category.

²³ For businesses registered under special tax regimes (most importantly, presumed income regimes for mining, which in practice include businesses with significant annual sales values), accrued profits were estimated using a different procedure. The first step entailed estimating operating cash flows (sales minus purchases and remunerations) from VAT declarations and forms filed by employers. The primary difference between accrued profits and cash flow arises from the treatment of fixed assets: purchases are deducted to compute cash flows, but only depreciation during the fiscal year is deducted to compute profits. A correction factor for this difference was then estimated by examining ratios of profits to cash flows for businesses in the general tax regime.

²⁴ For those firms that distributed profits during only one of the two years for which we obtained data, we assume that ownership did not change significantly across the four-year interval and thereby apply the same ownership shares calculated from the year in which the business did distribute profits to the year in which it did not. This situation arose only for partnerships (*sociedades de personas*), which change ownership less frequently than corporations.

²⁵ A small residual remained after nine iterations and was allocated along with profits from businesses for which we lacked ownership information as described in the following paragraph.

²⁶ Many of the businesses that reported net accrued losses still distributed profits, so we were able to calculate ownership shares for imputing these losses. In addition, partnerships must report various 'disallowed expenses' (*gastos rechazados*) that cannot be deducted in calculating taxable profits; businesses provide information on the distribution of these expenses among their owners which can be used to calculate shares in the same manner as with distributed profits.

Accrued profits in pension funds, which belong to the contributors (as opposed to owners of the businesses that administer the funds),²⁷ were imputed in proportion to taxpayers' pension and wage income.²⁸ This procedure is highly approximate, given that we lack information on taxpayers' accumulated pension contributions that would be needed to calculate ownership shares for members of any given pension plan administrator (AFP). However, our procedure captures the general idea that this form of capital income accrues to labour rather than business owners.²⁹ It bears emphasis that the profits accrued in these funds are small – only 2 per cent of total accrued profits, which corresponded to just 0.7 per cent of total pension and work income in 2005. As such, profits accrued in pension funds do not have a significant effect on top income shares.

1.2 Adjusting for undeclared income

In addition to estimating top income shares using declared income in the categories described above, which is the norm in the top incomes literature, we also estimate shares after adjusting income in three categories to the Chilean Central Bank's national accounting figures: independent work, distributed profits, and accrued profits. This section describes our rationale for adjusting these incomes and the procedures we employ to impute undeclared income. Appendix 1 provides additional methodological details.

The first two types of income – independent work and distributed profits – are subject to significant under-reporting. Most independent professionals opt to declare expenses under a simplified presumptive regime, which in practice probably inflates expenses and thereby reduces declared income in many cases. Regarding distributed profits, as previously discussed, the tax system creates strong incentives for under-declaration and provides many loopholes to access retained profits for consumption, and it is difficult for the tax agency to obtain information from impartial third parties that would help detect inconsistencies on tax declarations.³⁰ The amount of independent work income calculated from national accounts was 1.3 (1.5) times higher than the total declared to the tax agency in 2005 (2009). The discrepancy for distributed profits was far greater – the national accounts figure was 2.8 (3.2) times greater than the tax agency figure. We believe that this very large gap is explained primarily by evasion. The national accounts value, which is a residual calculated from changes in assets based on information provided by financial institutions, is accepted by Chilean experts as a good approximation of the profits actually distributed to households. The other components of household income in the national accounts come from reliable sources and should be free of significant measurement error, so the accounting discrepancy that would otherwise arise must reflect unreported distributed profits.

Total accrued profits constructed from national accounts surpassed the tax agency total by a lesser but still substantial factor of 1.9 (2.2). This discrepancy is likely explained by a combination of under-declaration, tax benefits that could not be estimated (especially for asset depreciation) which should be added back to declared taxable profits, and the inherent difficulties of constructing a matching definition of accrued profits from national accounts, which are derived from different data to serve different purposes. Despite the latter issue, we think it

²⁷ Any accrued profits imputed to pension fund administrators from other businesses are the property of the contributors who will later draw on these earnings for their pensions.

²⁸ Independent workers during these years were not required to contribute to pension funds, and their voluntary savings in pension funds tended to be small.

²⁹ We cannot distinguish between profits from pension funds and profits from mutual funds; however, pensions are known to dominate mutual funds. We impute the full amount to wage earners and pensioners.

³⁰ Tax agency access to bank information on checking accounts, which would help detect undeclared business income and independent work income, is highly restricted and cannot be used for general auditing operations.

best to adjust the imputed accrued profits to national accounts, given the two known sources of downward bias that affect our raw estimates.

Independent work. To adjust independent work income in our datasets, we first use Chilean household (CASEN) surveys to estimate the portion of the national accounts figure that accrues to individuals who did not file tax returns (Appendix 1). We then impute the difference between this amount and the tax agency total to taxpayers in proportion to their declared independent work income. In other words, we assume that the distribution of undeclared independent work income is identical to the distribution of declared independent work income.

Distributed profits. To adjust distributed profits, we impute the full difference between the national accounts value and the tax agency value to tax filers. In doing so, we assume that non-filers do not receive any substantial capital income,³¹ which we believe is appropriate for Chile given the relatively large percentage of adults registered with the tax agency and the evident concentration of capital income in tax agency data; household surveys also suggest that capital income is extremely concentrated (Cantellopts et al. 2007). We employ two alternative methods for imputing undeclared profits. The first method entails allocating the difference between the national accounts total and the tax agency total in proportion to taxpayers' declared distributed profits, again assuming that the distribution of undeclared profits does not differ from that of declared profits. This approach likely overestimates evasion among taxpayers who declared substantial distributed profits and underestimates evasion among taxpayers with large accrued profits who declared minimal distributed profits. Our second method makes the alternative assumption that evasion is proportional to the difference between taxpayers' accrued profits and the distributed profits that they declare. In other words, we assume that an individual with a large value of accrued profits who declared a minimal value of distributed profits has engaged in substantial evasion (rather than truthfully reinvesting profits in the firm). This approach alters the distribution of distributed profits to reflect the distribution of imputed accrued profits more closely. Of course, neither approach is likely to give an accurate depiction of the actual distribution of undeclared profits, which is by definition unknown. Together with the unadjusted data, however, they serve to delineate the range of uncertainty.

Accrued profits. For accrued profits, we simply assign the difference between national accounts and tax agency totals in proportion to the positive net accrued profits in our datasets. This procedure is likely to overestimate earnings for taxpayers at the top of the accrued profits ranking, since taxpayers with large net accrued losses do not receive any positive adjustment, even though they too may have either under-declared gains or over-declared losses.

Other income sources. We make no adjustments to wage income or pensions reported to the tax agency. Employers withhold taxes on wages, so it is unlikely that tax agency data suffers from under-reporting. It is possible that some individuals with taxable wage incomes are absent from the tax agency's records because they work for employers operating in the informal sector, but we think it is reasonable to assume that the informal sector by and large does not include individuals who fall within the ranks of the top 10 per cent.³² The amount of wage income reported in national accounts for 2005 (2009) exceeded the tax agency figure by 31 per cent (27

³¹ Alvarado and Saez (2010) make the same assumption for Spain that 'non-filers receive a negligible fraction of capital income'.

³² Most of the difference between the tax agency and national accounts wage figures comes from informal labour in the agricultural sector and domestic servants, who are not required to file tax returns. Some of the difference between tax agency and national accounts figures could arise from avoidance mechanisms whereby a portion of a taxpayer's salary is disguised as payments to a business owned by that taxpayer. If this practice is widespread, our control income, which includes the full national accounts value for wage income, would be inflated (assuming that this income is accurately reported to the tax agency as business income).

per cent); we allocate this amount entirely to the bottom of the income distribution. In the case of pensions, tax agency information comes directly from the pension administrators who distribute the funds, so this data should not be affected by under-declaration either.

We do not adjust reported capital gains, rent, or interest earnings in our datasets for lack of information on the total amounts of income in these categories beyond what is available in tax agency records. It should be noted that rental income and capital gains (including habitual capital gains classified as interest) may suffer from substantial under-reporting, since the tax agency does not receive information on these income sources from parties other than the taxpayers themselves. In contrast, the tax agency does receive independent information from financial entities on interest earnings from bank accounts and mutual funds, so data on these types of income is more accurate.

1.3 Income definitions for analysing top shares

We analyse top income shares using several different income definitions. We begin with a definition based on taxable income that corresponds to earnings realised during the year. This income, denoted Y1, includes pensions, wages, independent work, taxable interest, and distributed profits.³³ We exclude capital gains because this income category in our datasets includes capital gains received by businesses, which are not necessarily distributed to owners; these capital gains dominate those received directly by individuals.

We next construct an income Y2 that substitutes imputed accrued profits for distributed profits. The logic is to approximate more closely a Haig-Simons income definition – consumption plus changes in net worth – which aims to measure individuals' potential to consume without reducing their wealth during the period in question. This approach is arguably preferable for characterising material resources at the top when realised capital income is small compared to unrealised capital income (Smeeding and Thompson 2010).³⁴ Our Y2 income definition is particularly appropriate for Chile, given the tendency to under-declare or disguise distributed profits, as well as the fact that few capital gains are taxed. As Atkinson et al. (2010: 677) observe: 'When realized capital gains are untaxed and hence not observed, it is important to assess the effects of attributing retained profits to top income'.

We estimate top shares using a number of related income definitions that either include or exclude capital gains, alter the treatment of pensions, apply alternative adjustment procedures, or do not adjust independent work or profits to national accounts at all. Our preferred definition of income Y2 excludes capital gains (which are primarily received by businesses), because they may reflect profits generated in previous years rather than income generated during the year in question, and because including imputed capital gains along with accrued profits may result in some double-counting. In addition, since we are particularly interested in examining how top income shares change when examining accrued profits rather than distributed profits, we prefer to leave other components in the income definition unaltered compared to Y1.

³³ We would like to exclude public pensions, following top incomes studies that focus on market income, but tax agency figures mix public and private pension payments, and we do not have enough information to disaggregate the two. However, Chile's pension system was privatised in 1980, and the residual public system accounted for only 35% of pension payments in 2009. This figure excludes public pension top-ups that are paid to low income Chileans and financed by tax revenue. Recipients of these public-supported pensions do not earn enough to pay income taxes.

³⁴ Our income Y2 is similar to Smeeding and Thompson's (2010) 'More Complete Income', which includes imputed capital income. The authors substitute imputed capital income for reported interest, rents, and dividends to better approximate changes in net worth. For Chile, we lack sufficient information on real estate assets to be able to treat this income source similarly to retained profits.

Core income definitions:

Y1 = pensions + wages + independent work + taxable net interest + taxable rent + distributed profits; declared incomes only

Y1_NA = Y1 but adjusting independent work and distributed profits to national accounts

Y2 = pensions + wages + independent work + taxable net interest + taxable rent + imputed accrued profits; declared incomes and accrued profits for which ownership information exists only

Y2_ad = Y2 plus declared accrued profits in firms without ownership information imputed in proportion to declared distributed profits

Y2_aa = Y2 plus declared accrued profits in firms without ownership information imputed in proportion to the distribution of accrued profits for which we do have ownership information

Y2_NA = Y2_ad but adjusting independent work and accrued profits to national accounts

Auxiliary definitions:

Y1_NA_ada = Y1_NA but using the alternative distributed profits adjustment method based on the difference between taxpayers' positive accrued profits and distributed profits (calculated using accrued profits distribution from Y2_ad)

Y1_NA_ada' = Y1_NA_ada but calculated using the distribution of accrued profits from Y2

Y2_ad_ap = Y2_ad with imputed accrued profits from pension funds instead of pension payments

Y2_ad_cg = Y2_ad including capital gains.

1.4 Ranking taxpayers

Our work with the tax agency microdata produced three datasets based on different rankings of individual taxpayers, RY_a, RY_b, and RY_c, that correspond to distinct income definitions: one with unadjusted distributed profits, one with adjusted distributed profits, and one with adjusted accrued profits. After ranking individuals according to each income definition, the data was aggregated into groups consisting of eleven taxpayers each, following the tax agency's protocol for protecting taxpayer confidentiality.

Our subsequent analysis identified several minor errors affecting rankings. Below, we explain the shortcomings in our dataset rankings and assess the extent to which they may introduce errors in our income share estimates. We conclude that the effects are likely minimal, given the very fine level of aggregation in our datasets.

Our first dataset was constructed by ranking taxpayers according to income RY_a, which is similar to income Y1 with the exceptions that interest income was not included, and independent work income was adjusted to national accounts. The second dataset ranked taxpayers by income RY_b, which is similar to income Y1_NA, except that interest income was again excluded. In addition, the adjustment applied for independent work was too high, and distributed profits were inflated too much due to an error in the national accounts adjustment factor (2.5 instead of 1.8 for 2005 and 3.0 instead of 2.2 for 2009). The third dataset employed ranking income RY_c, which approximates Y2_NA_ad, with the same problems that interest income was omitted and independent work was slightly over-adjusted. Accrued profits in RY_c were also

adjusted incorrectly; net losses were amplified by the same factor as net gains, yet companies have no incentive to underestimate their losses.

The ranking income definitions described above determine the cohorts of eleven taxpayers aggregated in each dataset, and hence we cannot fully correct the ranking errors without renewed access to the tax agency microdata. However, we still have complete, correct information on the income sources and taxes paid for each given cohort (row) in our datasets, so we can re-rank the given cohorts according to the corrected income definitions. By comparing the new rank-orders of our aggregated rows with their original rank-orders, we endeavour to assess the magnitude of the errors introduced into our top income share estimates when we proceed in this manner. Appendix 2 displays the ratio of top income shares produced by the original rankings and by the re-rankings, the percentage difference in shares, the percentage of rows that moved in or out of each top fractile, and the corresponding amounts of income that moved into and out of each fractile upon re-ranking.

In all cases, the changes introduced by re-ranking datasets according to the desired corresponding income definition are marginal. The largest changes occur when re-ranking rows in the RY_c dataset according to income Y2. In this case, approximately 9 per cent of rows moved in or out of the top 1 per cent, producing a difference in income shares of only 0.6 per cent. The top 0.0001 per cent is not altered in any of the cases. The top 0.001 per cent is also unaffected, with the exception of the 2009 RY_a ~ Y1 re-ranking where one row shifts out of the fractile and is replaced by the second highest subsequent row.

Although we cannot know how income shares would change if the data was re-ranked at the individual level, these results suggest that the difference would probably be inconsequentially small. Moreover, the errors introduced will be much smaller than those in studies that work with pre-tabulated tax agency data.

In the remainder of the paper, we report top shares and effective tax rates for each income definition, calculated after re-ranking the rows in the most closely correlated dataset according to that income definition. The corresponding datasets employed for our primary income definitions are displayed in Table 1.1.

Table 1.1 Dataset rankings and corresponding incomes

RY_a	RY_b	RY_c
Y1	Y1_NA	Y1_NA_ada all Y2 incomes

1.5 Control incomes

We estimate control incomes (i.e. the denominator for calculating top income shares) by combining tax agency data with national accounts information, as is standard in the top incomes literature when sizeable portions of the adult population do not file tax returns. We construct total amounts of wage income, independent work, distributed profits, and accrued profits from national accounts. To these amounts we add total tax agency figures for taxable rent and interest, for which comparable figures could not be constructed from national accounts. This procedure produces control incomes corresponding to Y1_NA (adjusted distributed profits and other realised income) of approximately 60 per cent of GDP, the same value used for Argentina (Alvaredo 2010). This value is also similar to control incomes for other countries analysed in the

Atkinson and Piketty (2009, 2010) top incomes volumes.³⁵ When we replace distributed profits with imputed accrued profits (Y2_NA), our control income increases to 70-72 per cent of GDP.

For the income definitions that use profits declared to the tax agency without adjustments (Y1, Y2, Y2_ad, Y2_aa), we use the total value of declared profits from the tax agency datasets in the control income instead of the national accounts figures, in accordance with our assumption that capital income accrues only to tax filers.³⁶ These control incomes are substantially smaller (which is not surprising given the large discrepancy between capital income reported to the tax agency and capital income calculated from national accounts): 50-51 per cent of GDP for Y1, 54-55 per cent of GDP for Y2, and 57-59 per cent of GDP for Y2_ad (aa).

Table 1.2 displays the control incomes corresponding to the core and auxiliary income definitions we examine. The amounts change very little across the two years.

Table 1.2 Control incomes, % GDP

	2005	2009
Y1	50.7	50.0
Y1_NA	59.3	60.2
Y2	53.3	52.3
Y2_ad, aa	58.4	57.0
Y2_cg	58.5	57.2
Y2_ap	54.2	53.0
Y2_NA	70.0	71.7

1.6 Control populations

Income taxes in Chile are filed individually. There is no option for married couples to file jointly, and they receive no preferential tax treatment. For the control population, we therefore use estimates of the adult population over age 20, following the usual approach in the top incomes literature.³⁷

Table 1.3 Population and tax returns

	Population over 20 <i>Source: Instituto Nacional de Estadisticos</i>	Tax returns <i>Source: SII</i>
2005	10,750,033	6,808,535
2009	11,582,966	7,731,605

2 Top income shares and compositions

We begin our analysis of top income shares by discussing results calculated including distributed profits (Y1 incomes, Table 2.1a). Top shares are significantly smaller when distributed profits are not adjusted to national accounts (Y1) compared to scenarios that do adjust profits (Y1_NA and Y1_NA_ada). For the top 1 per cent, for example, we estimate an

³⁵ As Leigh (2009: 157) observes: 'there do not appear to be systematic differences between nations. On average, the personal income control total is about two-thirds of GDP'.

³⁶ We likewise exclude from the control income the amount of independent work income that we estimate is evaded by tax filers. Including this amount lowers top share estimates only slightly.

³⁷ Studies of Argentina, Canada, Italy, Japan, Portugal, and the US in Atkinson and Piketty (2009, 2010) also use the adult population over 20. A few studies use a cut-off age of 15, but to our knowledge very few Chileans under 20 file tax returns. Atkinson et al. (2010: 669) maintain that the chosen age cut-off makes little difference to top income shares.

unadjusted share of 15.5 per cent, whereas adjusted shares range from 21.7-23.0 per cent. We view the unadjusted shares as lower limits, given the problem of under-declared distributed profits. The adjusted shares we present are of course educated guesses given that the actual distribution of undeclared profits is unobservable. However, we believe that the general upward effect on top income shares is accurate. Note also that for the top 1 per cent, estimated adjusted shares do not vary much across the alternative methods used to impute undeclared profits.

Table 2.1b and Figure 2.1 place Chile's top income shares in a cross-national context. When examining this data, it is important to remember that definitions of income depend on tax systems and therefore vary in potentially non-trivial ways; methodological differences in how control incomes are calculated across countries may affect results as well.³⁸ At present these difficulties remain unresolved in the top incomes literature. Bearing these caveats in mind, we present some tentative comparative conclusions.

When profits are not adjusted to national accounts, Chile's top 1 per cent shares are similar to Singapore and the UK – higher than most European countries, but lower than the four inequality leaders in the World Top Incomes Database: Colombia, Argentina, the US, and South Africa (Figure 2.1a). However, we believe it is more appropriate to use Chile's adjusted top income shares in cross-national comparisons. Although adjusting top incomes to national accounts is not standard in the top incomes literature, Chile's tax system creates strong incentives for under-declaring distributed profits that are unique to our knowledge.³⁹ When profits are adjusted to national accounts, Chile's top 1 per cent share surpasses that calculated for any other country in the World Top Incomes Database. Evasion-adjusted top 1 per cent shares for Argentina in 2003 and 2004 (Alvaredo 2007) reach similarly high levels.⁴⁰

Shares with adjusted profits for Chile's top 0.1 per cent and higher fractiles are more sensitive than top 1 per cent shares to the method used for imputing undeclared dividends. Adjusted top 0.01 per cent Y1_NA_ada shares are similar to adjusted Argentine shares and higher than all other countries that have been analysed using tax return data (Figure 2.1b). Chile's adjusted Y1_NA shares are substantially lower but similar to South Africa. Unadjusted Chilean shares are closer to those in European countries.

Our estimated income shares for the top 10 per cent, 1 per cent and 0.1 per cent do not vary significantly from 2005 to 2009. Shares at the very top show more percentage variation. For the top 0.0001 per cent, Y1 (unadjusted) and Y1_NA shares are about half as large in 2009, a recessionary year, whereas Y1_NA_ada shares (distributed profits adjusted to the gap with accrued profits) are roughly two times larger in 2009.

Figure 2.2 shows the Lorenz curves (cumulative income distribution) for the top 10 per cent and top 1 per cent in 2005, plotted directly from our datasets. For the top 1 per cent Y1_NA_ada curve, note the break in the line at the top right corner. The gap between the highest two points illustrates the remarkably disproportionate share in this adjusted scenario received by the top 0.0001 per cent of Chilean adults.

³⁸ For more on these issues, see Atkinson et al. (2010). Appendix 4 displays shares within shares, following Atkinson (2009a), which are independent of the estimated control income.

³⁹ Similar incentives do not exist in Argentina or Colombia, where the top personal income tax rate matches the corporate tax rate and dividends do not enter the personal income tax base. In Argentina, tax agency officials have observed that, if anything, individual taxpayers have incentives to over-declare capital income in order to justify changes in patrimony that might otherwise alert officials to investigate for potential evasion or money laundering (AFIP 2008, interview).

⁴⁰ Alvaredo's methodology for adjusting incomes differs from ours. He views the adjusted Argentine shares as upper limits that likely overestimate evasion among the very rich.

Table 2.1 Income shares with distributed profits only

a) Chile 2005 (2009)

	Top 0.0001%	Top 0.001%	Top 0.01%	Top 0.1%	Top 1%	Top 10%
Y1	0.090 (0.049)	0.332 (0.256)	1.082 (0.973)	3.998 (3.781)	15.47 (14.88)	49.24 (48.78)
Y1_NA	0.211 (0.106)	0.627 (0.449)	1.812 (1.627)	6.121 (5.884)	21.69 (21.56)	55.40 (55.79)
Y1_NA_ada	0.645 (1.136)	1.598 (2.166)	3.702 (4.209)	8.590 (9.106)	22.28 (22.74)	55.01 (55.52)
Y1_NA_ada'	1.017 (1.751)	2.380 (3.279)	5.271 (5.937)	10.68 (11.31)	23.02 (23.66)	55.04 (55.56)

b) Cross-national comparisons, c. 2005 (2009)

	Top 0.001%	Top 0.01%	Top 0.1%	Top 1%	Top 10%
Argentina adjusted, 2004 ¹	NA	3.77	10.29	22.10	NA
Argentina, 2004 ²	NA	2.49	7.02	16.75	NA
Colombia, 2003 ³	0.5 (0.9)	1.6 (2.4)	6.0 (7.1)	19.9 (20.2)	NA
United States, 2005 ⁴	NA	3.29 (3.06)	7.76 (7.52)	17.68 (17.45)	44.94 (46.35)

¹ Alvaredo (2007)

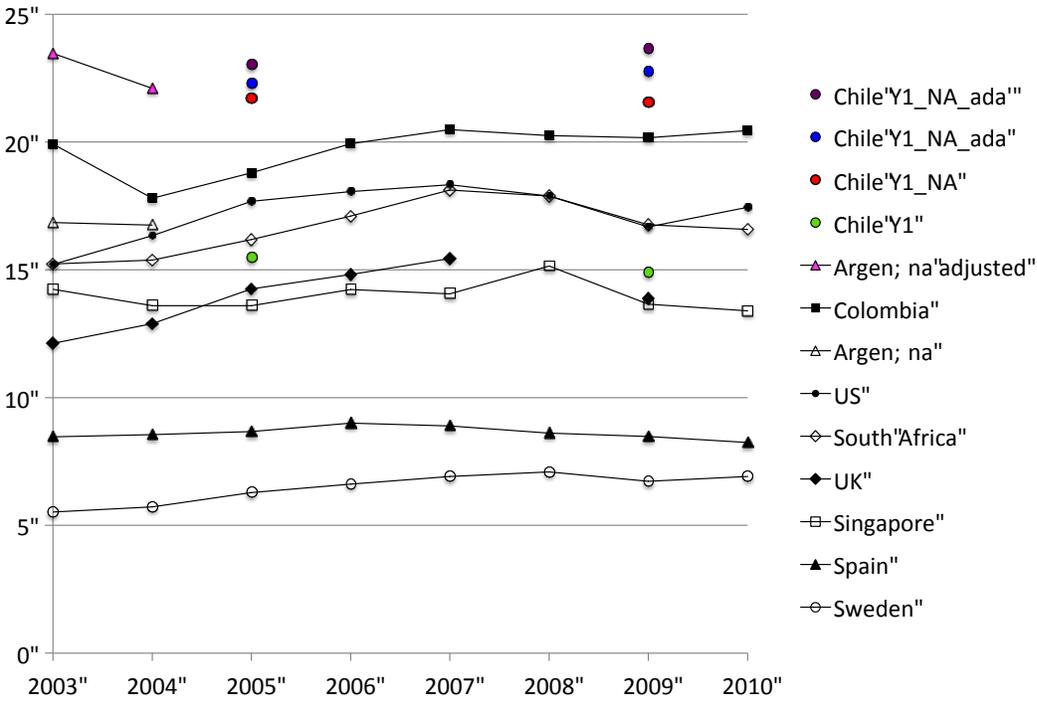
² Alvaredo (2010)

³ Alvaredo and Londoño Vélez (2013)

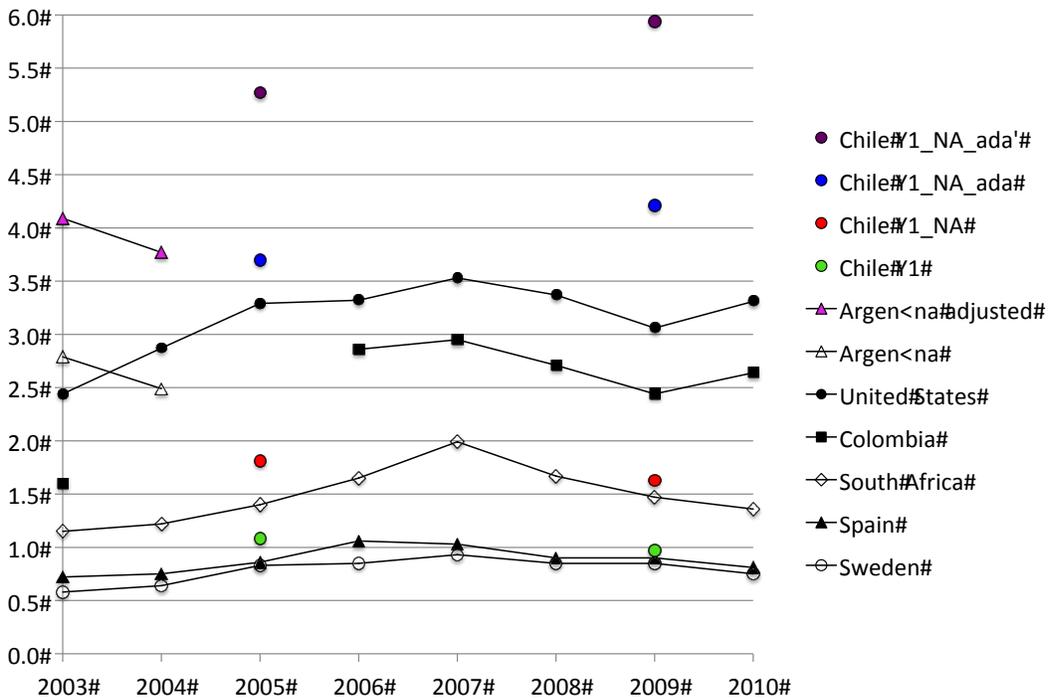
⁴ Piketty and Saez (2006)

Figure 2.1 Income shares (%), excluding capital gains

a) Top 1%



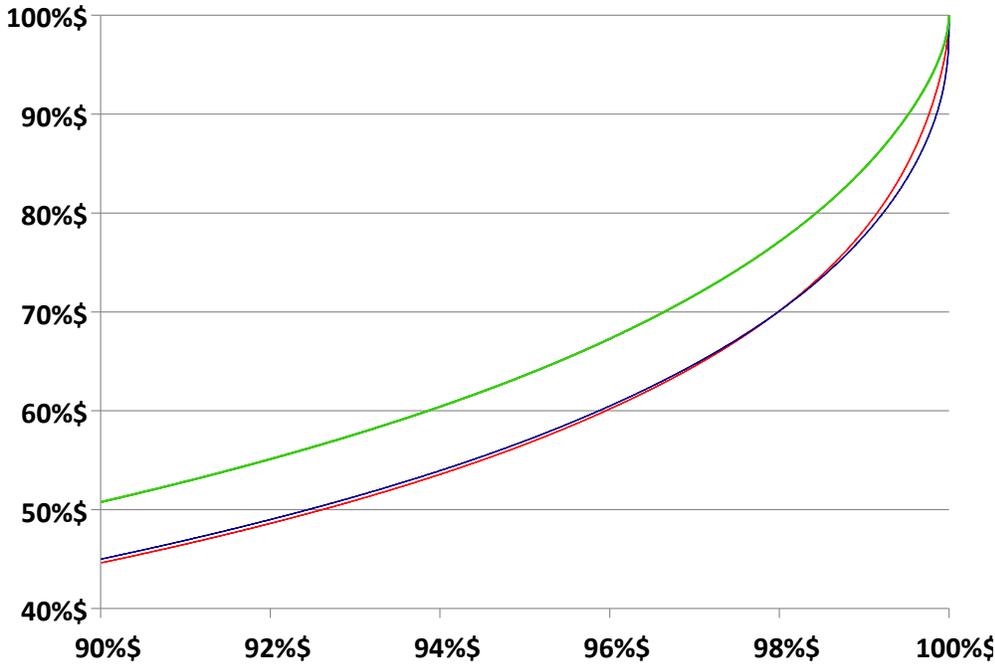
b) Top 0.01%



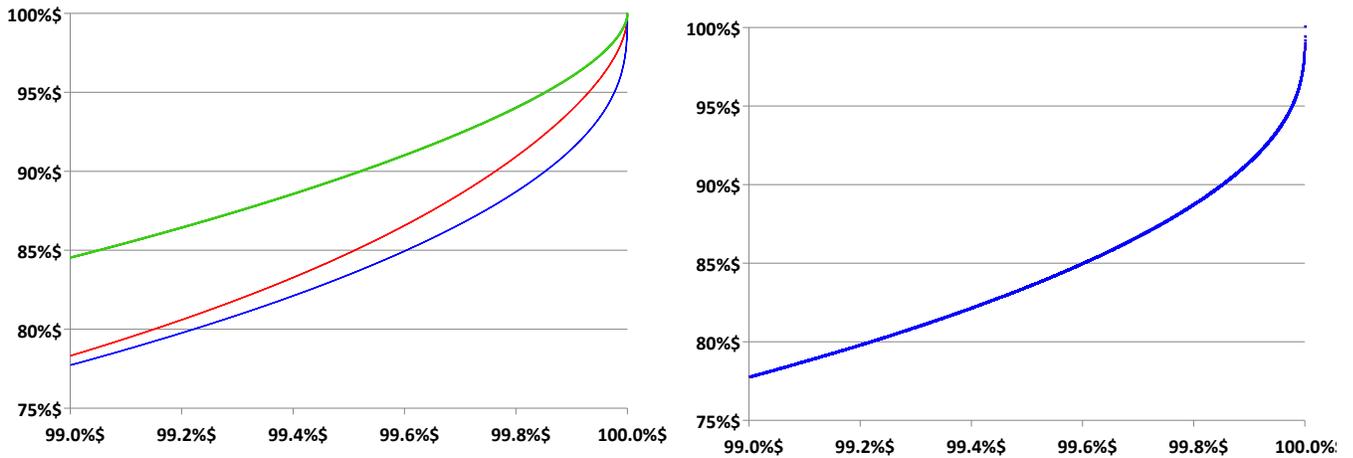
Source: Authors' calculations, Alvaredo et al. *World Top Incomes Database*, Alvaredo (2007)

Figure 2.2 Lorenz curves, 2005
Y1 (green), Y1_NA (red), Y1_NA_ada (blue)

a) Top 10%



b) Top 1%



Top income shares based on accrued profits (Table 2.2) are significantly larger than shares including only distributed profits, indicating the very high concentration of capital ownership in Chile. These findings agree with other studies that report more significant inequality when working with income definitions that include broader sources of realised and/or unrealised capital income (Smeeding and Thompson 2010; Atkinson and Piketty 2010; Roine and Waldenström 2011). Interestingly, unadjusted shares with accrued profits are close to Y1_NA_ada shares with adjusted distributed profits. This similarity arises from the fact that the alternative dividends adjustment procedure produces a distribution of distributed profits that is

similar to the distribution of declared accrued profits. Figure 2.3 displays the 2005 Lorenz curves for Y2_ad and Y2_NA. As with Y1_NA_ada (Figure 2.2), the top 1 per cent Y2_NA curve shows a break at the top, indicating the very high income share accruing to the top 0.0001 per cent.

Cross-national comparisons are complicated by the fact that the distribution of retained profits has rarely been analysed in other countries.⁴¹ However, we can tentatively compare Chile's income shares with accrued profits to income shares including capital gains in other countries, assuming for these other countries as Piketty and Saez (2006: 9) do for the US that 'realized capital gains on corporate stock reported on individual tax returns are of comparable magnitude to retained earnings from corporations estimated in National Accounts'. Chile's top 1 per cent shares with accrued profits in all but one of the scenarios exceed those for the US; top 0.01 per cent shares are comparable or slightly higher than those for the US (Figure 2.4). Chile's top fractile shares in all scenarios exceed those in the handful of additional countries for which top income studies have included capital gains.

Table 2.2 Income shares

a) Chile, 2005 (2009), with accrued profits

Chile	Top 0.0001%	Top 0.001%	Top 0.01%	Top 0.1%	Top 1%	Top 10%
Y2	0.756 (1.222)	1.771 (2.292)	3.958 (4.199)	8.229 (8.282)	19.34 (19.23)	52.60 (52.46)
Y2_ad	0.719 (1.129)	1.773 (2.152)	4.078 (4.185)	9.322 (9.103)	23.52 (22.82)	56.29 (55.85)
Y2_aa	1.125 (1.817)	2.639 (3.398)	5.802 (6.132)	11.66 (11.64)	24.52 (24.09)	56.46 (56.08)
Y2_ad_ap	0.775 (1.215)	1.911 (2.315)	4.394 (4.501)	10.04 (9.785)	25.24 (24.43)	58.84 (58.51)
Y2_ad_cg	0.749 (1.156)	1.803 (2.304)	4.143 (4.422)	9.430 (9.380)	23.63 (23.07)	56.35 (55.99)
Y2_NA	1.100 (1.880)	2.701 (3.571)	6.143 (6.833)	13.67 (14.31)	31.66 (32.32)	62.76 (63.65)
Y2_NA_cg	1.168 (1.513)	2.833 (3.687)	6.437 (7.012)	14.30 (14.51)	32.99 (32.50)	65.30 (63.75)

b) Cross-national comparisons, 2005 (2009), with capital gains

	Top 0.0001%	Top 0.001%	Top 0.01%	Top 0.1%	Top 1%	Top 10%
United States	NA	NA	5.13 (3.89)	10.98 (8.3)	21.92 (18.12)	48.33 (46.5)
Germany	NA	NA	2.25	4.81	11.76	37.01
Japan	NA	NA	1.36 (1.06)	3.6 (3.15)	11.04 (10.42)	42.43 (41.31)
Spain	NA	NA	1.59 (1.19)	4.11 (3.18)	10.86 (9.27)	34.7 (32.97)
Sweden	NA	NA	1.26 (1.2)	3.33 (2.9)	8.99 (8.41)	29.77 (30.03)

Source: Alvaredo et al. *World Top Incomes Database*

⁴¹ Atkinson (2009b: 99-100) analyses how retained profits affect top income shares in the UK during the inter-war period, drawing on limited data available on personally-owned shares.

Figure 2.3: Lorenz curves, including retained profits, 2005
Y2_ad (blue), Y2_NA (purple)

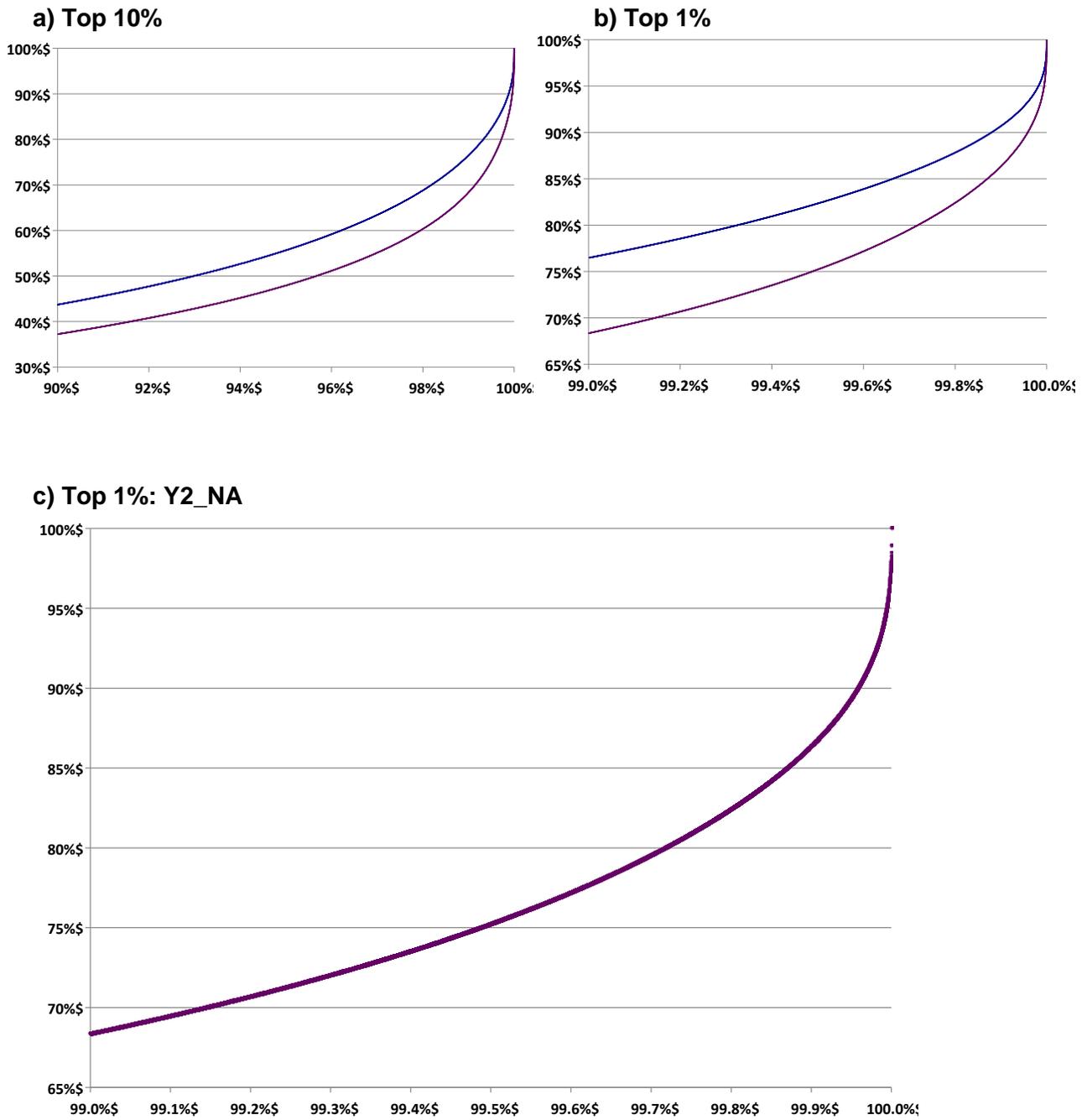
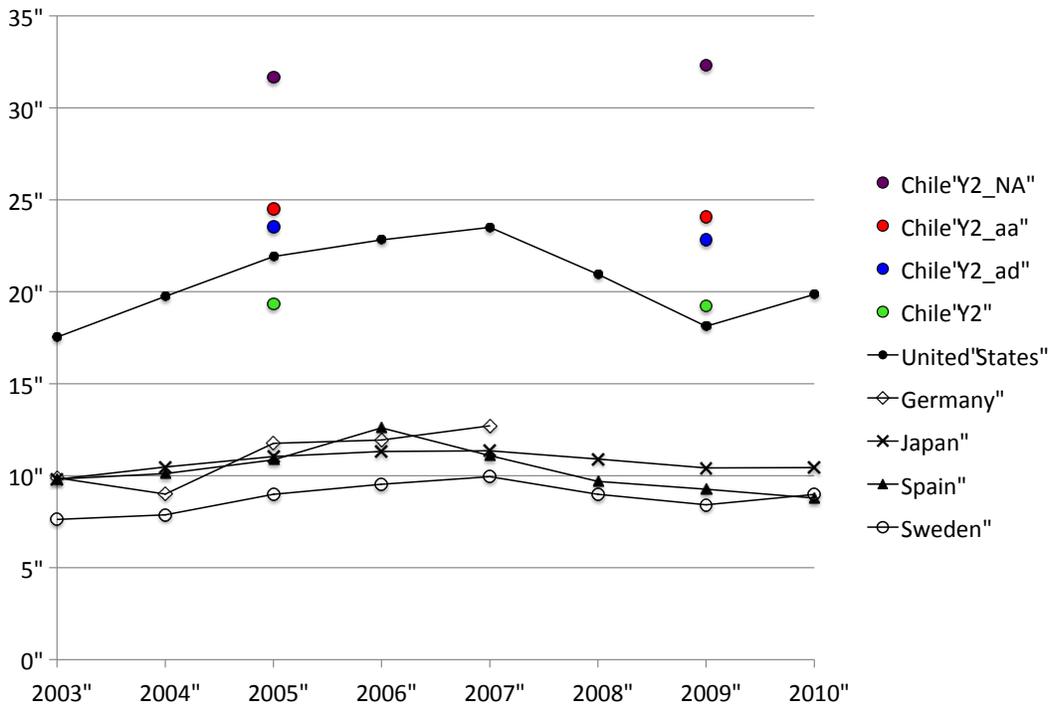


Figure 2.4 Shares (%), including retained profits (Chile) or capital gains

a) Top 1%



b) Top 0.01%

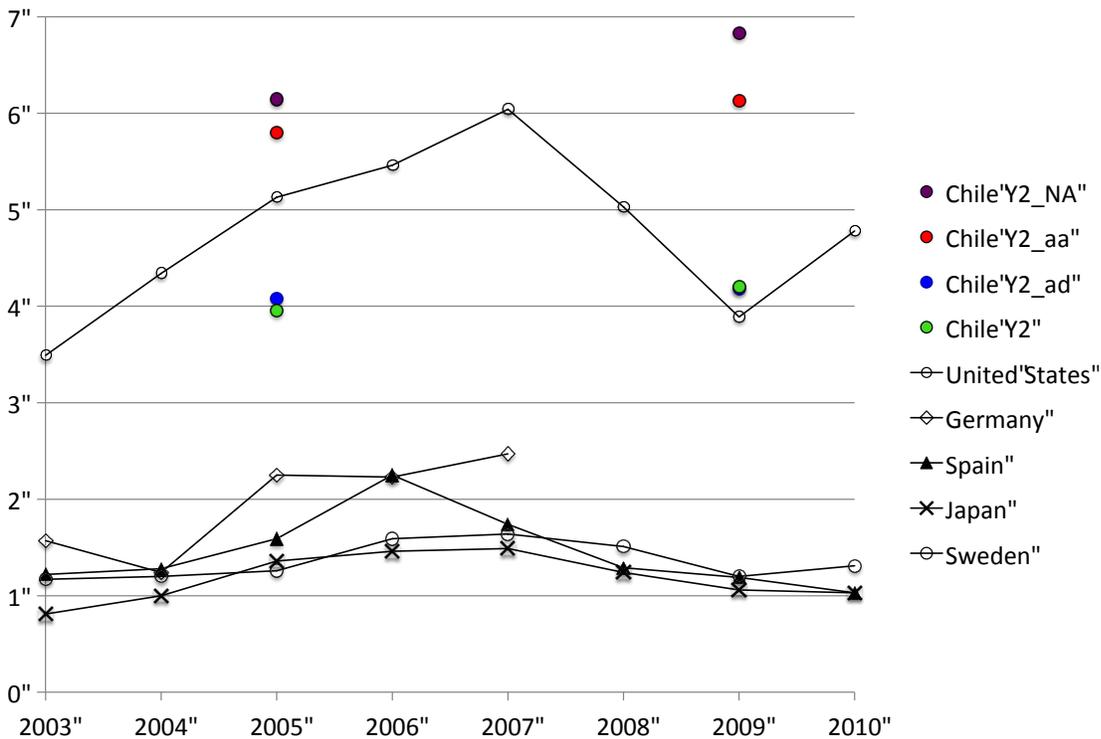


Table 2.3 compares Chile's income shares with distributed vs. accrued profits. Here we calculate shares with accrued profits using two different rankings: one that includes only distributed profits, and one that includes accrued profits instead. The goal is to assess how much retained profits augment income shares for those who already declare high levels of realised income, and to ascertain how much top shares are affected by re-ranking taxpayers based on their accrued profits rather than their distributed profits.⁴² These rankings in fact may be quite different for the top percentiles. While distributed profits are correlated with accrued profits, there are taxpayers who declare relatively low distributed profits even though their accrued profits are quite large. On the other hand, there are cases in which business owners receive distributed profits even though the net profits they accrued were actually negative. The mismatch between distributed and accrued profits in these latter cases may occur for several reasons. First, businesses may distribute profits accrued during a previous year even if they registered losses in the current year. Second, an individual may hold ownership in multiple businesses, some of which distribute profits but some of which accrue large losses that overwhelm profits accrued in the other firms. Third, some of the mismatch between distributed and accrued profits may be an artifact of our imperfect reconstruction of accrued profits from taxable profits, due to the difficulties of estimating tax allowances for depreciation.

Ranking by dividends (Y1) produces smaller top shares of income including accrued profits (Y2) than ranking by Y2, particularly for the top two fractiles (Table 2.3). This result indicates that the two rankings do produce significantly different sets of top taxpayers. Ratios of top 1 per cent shares with accrued profits to those with distributed profits range from 1.46–1.53, a similar factor to ratios of top 1 per cent shares with capital gains to those without in Sweden (Roine and Waldenström 2011).

Table 2.3 Income shares with distributed vs. accrued profits by different rankings 2005 (2009)

	Top 0.0001%	Top 0.001%	Top 0.01%	Top 0.1%	Top 1%	Top 10%
Y1	0.090 (0.049)	0.332 (0.256)	1.082 (0.973)	3.998 (3.781)	15.47 (14.88)	49.24 (48.78)
Y2_ad ranked by Y1	0.187 (0.091)	0.941 (0.394)	2.340 (1.642)	6.681 (5.395)	20.93 (18.90)	54.02 (52.97)
Y2_ad	0.719 (1.129)	1.773 (2.152)	4.078 (4.185)	9.322 (9.103)	23.52 (22.82)	56.29 (55.85)
Ratio Y2_ad to Y1	7.99 (23.0)	5.34 (8.41)	3.77 (4.30)	2.33 (2.41)	1.52 (1.53)	1.14 (1.15)

	Top 0.0001%	Top 0.001%	Top 0.01%	Top 0.1%	Top 1%	Top 10%
Y1_NA	0.211 (0.106)	0.627 (0.449)	1.812 (1.627)	6.121 (5.884)	21.69 (21.56)	55.40 (55.79)
Y2_NA ranked by Y1_NA	0.351 (0.203)	1.509 (0.883)	3.845 (2.929)	10.66 (9.344)	29.45 (28.69)	60.47 (60.32)
Y2_NA	1.100 (1.880)	2.701 (3.571)	6.143 (6.833)	13.67 (14.31)	31.66 (32.32)	62.76 (63.65)
Ratio Y2_NA to Y1_NA	5.21 (17.7)	4.31 (7.95)	3.39 (4.20)	2.23 (2.43)	1.46 (1.50)	1.13 (1.14)

We turn now to the composition of top incomes in Chile. Figure 2.5 shows the share of each income type for the top percentiles (Appendix 3 tabulates the data). For income definitions Y1_NA, Y2_ad, and Y2_NA, business income dominates other income sources for Chileans within the top 1 per cent. The minimum business income was 44 per cent, for the case of top 1-0.5 per cent Y2_ad earners (unadjusted accrued profits) in 2009. The top 0.1 per cent and higher fractiles receive over 80 per cent of all income from business profits, whether distributed or accrued. For comparison, the charts with accrued profits (Y2_ad and Y2_NA) also display declared distributed profits and capital gains as a percentage of total Y2 income, even though

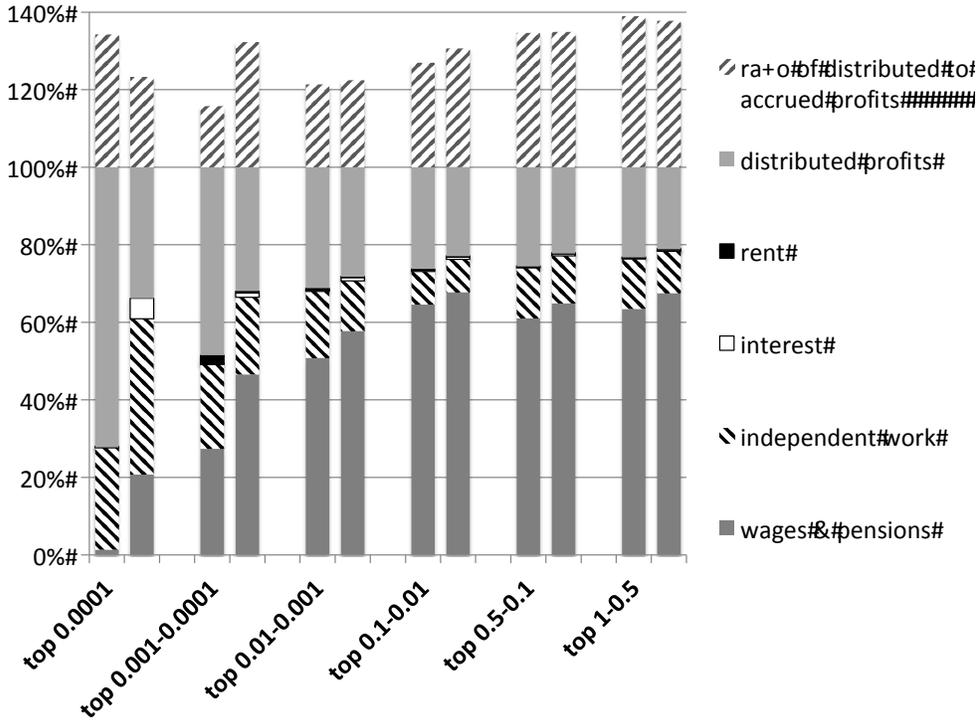
⁴² Roine and Waldenström (2011) use a similar approach to assess the importance of capital gains at the top of the income distribution in Sweden.

neither distributed profits nor capital gains are included in the income definition. Likewise, the chart with unadjusted distributed profits (Y1) also displays the ratio of declared distributed profits to unadjusted accrued profits. These percentages are all generally low (16-39 per cent), indicating that declared distributed profits are not a good measure of business income accruing to the wealthiest Chileans.

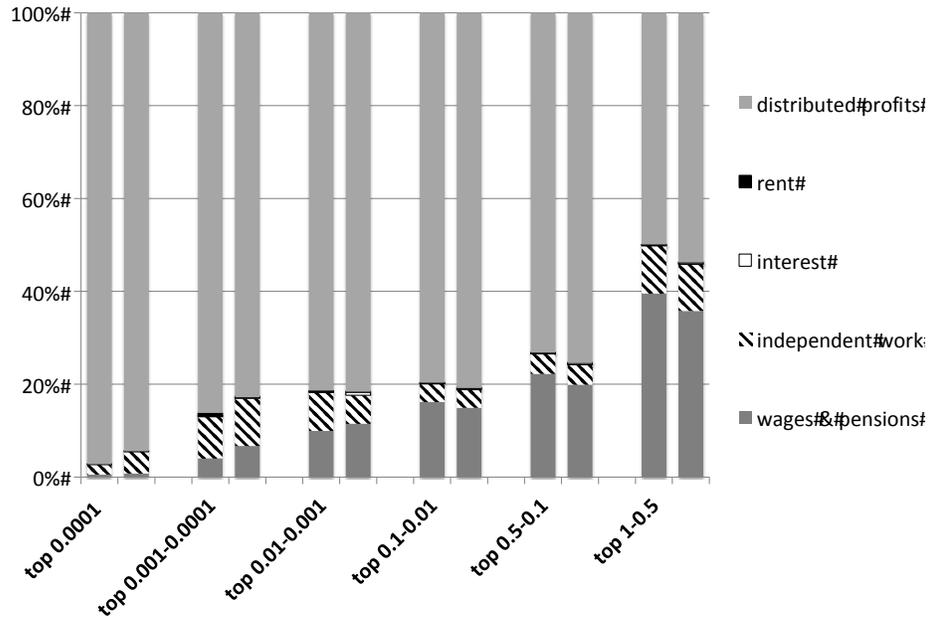
Incomes with unadjusted distributed profits (Y1) show two distinct features from the other scenarios. First, business income makes up a much smaller share of total declared income. Distributed profits dominate work income only for the top 0.001 per cent and higher in 2005, and in 2009 they reach a maximum contribution of only 33 per cent. Second, the composition of top incomes is more variable across the two years. Declared distributed profits make up a much lower share of the two top percentile incomes in 2009 (34 per cent and 32 per cent respectively) compared to 2005 (72 per cent and 48 per cent respectively). This fluctuation may reflect a combination of reduced profits distributed by big businesses in 2009 and greater evasion in the recessionary context. In contrast, the composition of unadjusted top incomes with accrued profits (Y2_ad) does not vary much across the two years. Accrued profits make up a consistently high percentage (over 98 per cent) of the top two percentiles. The large variability of income compositions in the unadjusted Y1 data likely indicates the importance of taking undeclared distributed profits into account. The total amounts of income (whether adjusted or not) from each of the different sources as a percentage of GDP do not vary much across the two years, making the large variation in the weight of business income at the top of the unadjusted distribution more questionable.

Figure 2.5 Top income compositions (2005 (left bar) and 2009 (right bar))

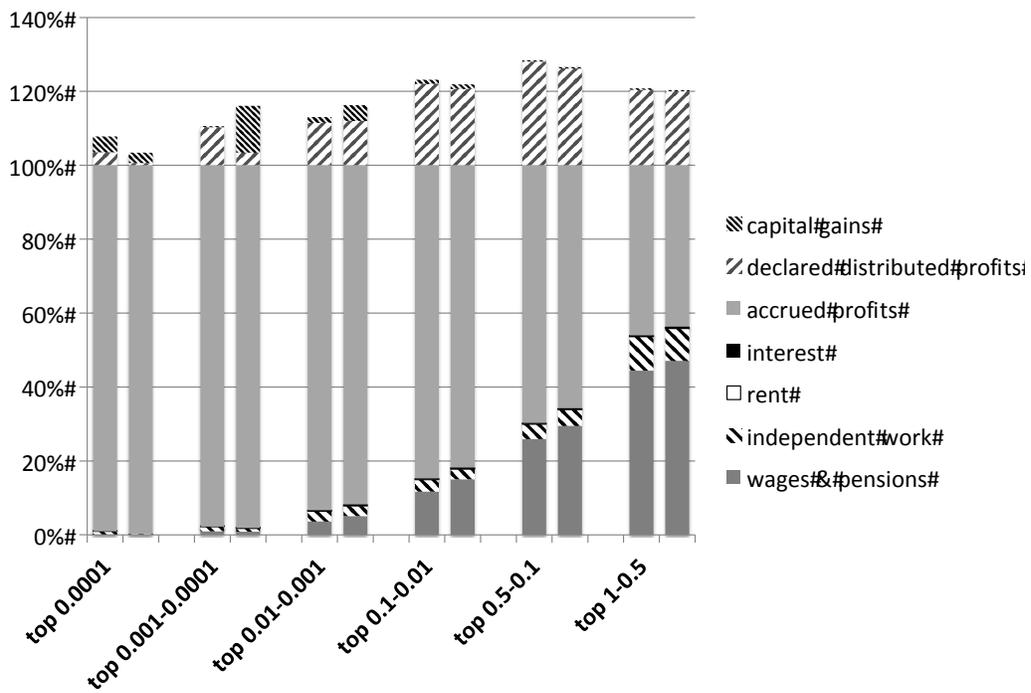
a) Y1



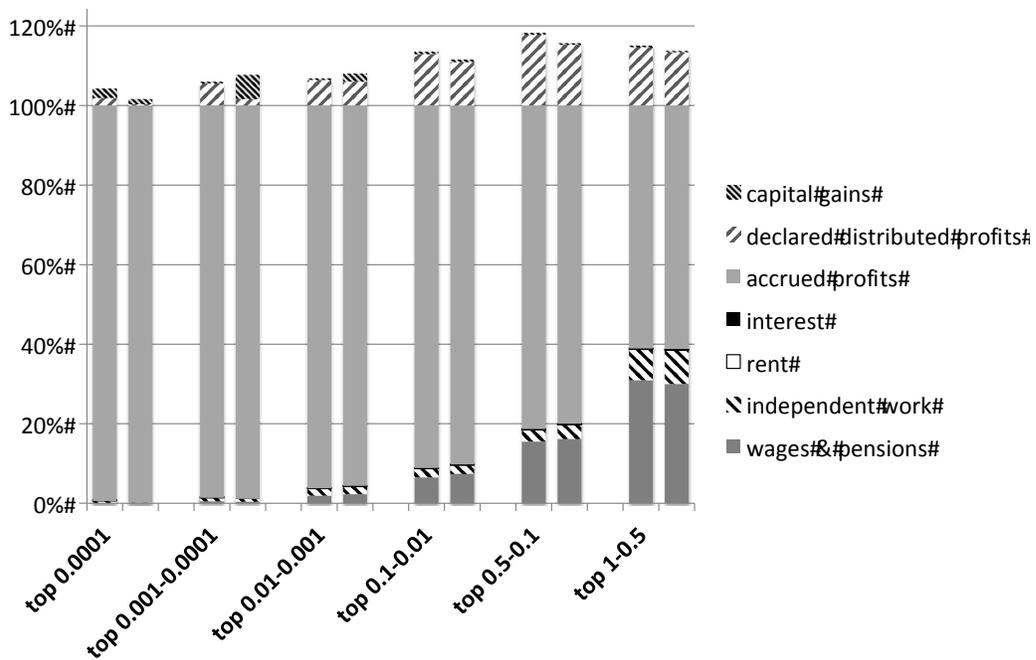
b) Y1_NA



c) Y2_ad



d) Y2_NA



3 Effective tax rates

While Chile’s individual income tax imposes comparatively high top marginal rates, effective tax rates – understood as taxes paid divided by total income earned – are of course much lower, because the progressive tax rates apply only to income exceeding the corresponding thresholds displayed in Table 3.1. After describing our tax data, we present estimated effective individual income tax rates, ignoring retained profits and the corresponding corporate tax paid by companies. We then incorporate the corporate tax on retained profits into our analysis.

Table 3.1: Chile’s individual income tax rate structure, 2005 (2009)

Threshold (UTA)*	Marginal rate (%)	Percentage of taxpayers	Percentile of adult population
0-13.5	0	84.1 (81.7)	
13.5-30	5	10.5 (12.0)	Top 10.4 (12.5)
30-50	10	2.9 (3.3)	Top 3.56 (4.30)
50-70	15	1.2 (1.4)	Top 1.64 (2.06)
70-90	25	0.6 (0.7)	Top 0.87 (1.13)
90-120	32	0.4 (0.5)	Top 0.49 (0.64)
120-150	37	0.2 (0.2)	Top 0.23 (0.29)
150 and above	40	0.2 (0.2)	Top 0.13 (0.16)

* Chile’s tax system is fully inflation-adjusted. One UTA equalled 378,842 pesos (USD 674) in 2005 and 442,356 pesos (USD 804) in 2009

Source: SII and authors’ calculations

Our datasets contain information on the amounts of both individual and corporate income taxes collected by the tax agency. Chile’s individual income tax is divided into two categories. People who earn only wage income pay the ‘second category tax’ (*impuesto de segunda categoría* (ISC)) with progressive marginal rates rising from 5 per cent to 40 per cent.⁴⁴ People who receive any other sources of income instead of or in addition to wages pay the ‘complementary global tax’ (*impuesto global complementario* (IGC)), which applies the same progressive rate schedule to the sum total of taxable income.⁴⁵ The 17 per cent corporate income tax on accrued profits (*impuesto de primera categoría* (IPC)) was imputed to individuals using the same iterative assignment procedure that we employed to allocate accrued profits (Section 1.1). We imputed the comparatively small amount of corporate tax corresponding to accrued profits in pension funds (approximately 5 per cent of the total) in proportion to taxpayers’ work and pension income,⁴⁶ a similar procedure to that employed by Piketty and Saez (2006) for the US.

Amounts registered for the corporate tax and the IGC and may be negative, indicating that the tax agency has reimbursed the taxpayer. Loss carry-back is the most common scenario leading to negative corporate taxes. In general, the total annual amount of IGC paid tends to be negative, primarily because the credit for the 17 per cent corporate tax paid by companies when profits accrue tends to exceed the income tax that individuals owe on their distributed profits. However, at the very top of the income distribution IGC amounts are primarily positive.

⁴⁴ All marginal rates except for the top rate were lowered in 2012; the present rates (corresponding to the same thresholds) are 4%, 8%, 13.5%, 23%, 30.4%, 35.5%, and 40%.

⁴⁵ Capital gains are an exception: this income pays the corporate tax rate but does not enter into the IGC base and hence receives a preferential tax treatment compared to other income sources.

⁴⁶ We estimated the amount of corporate tax from pension funds by applying an effective tax rate (16.8%) calculated from aggregate figures to accrued profits in these funds. We do not take independent work into account when imputing corporate tax from pensions funds since the bulk of pension contributions were made by dependent workers. The 2008 pension reform, however, made pension contributions mandatory for independent workers from 2015.

Table 3.2 displays effective tax rates ignoring corporate taxes paid on accrued profits that are retained and excluding retained profits from the income definition, as is most common in incidence studies. However, we do include corporate taxes corresponding to distributed profits – that is, the portion of income taxes owed on distributed profits that was collected from the company when profits accrued rather than from the individual recipient when those profits were distributed. (Recall that Chile’s corporate tax is credited against individual income taxes owed when profits are distributed.) This part of the corporate tax was imputed to individuals by applying an effective tax rate from aggregate figures to declared distributed profits; as such, it should be stressed that these amounts are rough approximations.⁴⁷

Estimated effective tax rates are of course much higher when distributed profits are not adjusted to national accounts (scenario Y1) than when profits are adjusted to national accounts (scenarios Y1_NA and Y1_NA_ada). In the unadjusted scenario, the top 0.001 per cent paid 32 per cent (33 per cent) in 2005 (2009), while according to scenario Y1_NA, rates were less than half as high: 13 per cent (12 per cent). When declared profits are adjusted in proportion to the gap between positive accrued profits and declared distributed profits (Y1_NA_ada), average effective tax rates are particularly low. In this scenario, the top 0.001 per cent paid only 3 per cent in 2005 and merely 0.8 per cent in 2009. This result is explained by the different ranking of taxpayers which tends to place at the top individuals with large accrued profits but fewer declared distributed profits, and hence comparatively low personal income taxes paid.

Effective tax rates are fairly stable over time for the top 0.001 per cent and lower: the variation tends to be roughly within a percentage point. Rates for the richest 0.0001 per cent vary more substantially. The effective tax rate using unadjusted profits is 10 points higher in 2009 than in 2005, while the rate for scenario Y1_NA is two points higher in 2009 compared to 2005. In contrast, the top fractile rate in scenario Y1_NA_ada is lower in 2009 than in 2005 (0.3 per cent vs. 1.9 per cent). Tax legislation did not change over this period, so the temporal variation likely reflects the changing fortunes of Chilean firms and associated re-ranking of taxpayers.

Table 3.2: Average effective tax rates (%) (excluding corporate tax on retained profits)

Income denominator	Y1 (unadjusted)		Y1_NA (adjusted dividends)		Y1_NA_ada (alternative dividend adjustment)		Colombia ¹		US ²	Germany ³
	2005	2009	2005	2009	2005	2009	2006	2009	2004	2005
Top 0.0001%	28.82	38.12	9.52	11.96	1.87	0.29	NA	NA	NA	28.7
Top 0.001%	32.14	33.26	12.59	12.33	3.00	0.84	7.3	4.8	NA	31.0
Top 0.01%	31.81	30.51	13.17	11.81	4.41	2.95	8.3	7.1	25.6	32.9
Top 0.1%	26.82	26.55	11.65	10.39	7.09	5.98	8.7	7.7	24.8	33.7
Top 1%	16.12	17.17	8.98	8.55	8.55	8.33	7.5	7.1	20.8	30.5
P 99.99-100%	31.81	30.51	13.17	11.81	4.41	2.95	8.3	7.1	26.2	
P 99.9-99.99%	24.96	25.18	11.01	9.85	9.12	8.58	NA	NA	25.1	
P 99.5-99.9%	15.17	16.66	8.05	7.66	9.88	10.17	7.7	7.6	23.8	
P 99-99.5%	9.05	10.83	7.76	8.14	8.89	9.53	5.6	5.7	21.4	

¹ Alvaredo and Londoño Vélez (2013). Individual income tax including corporate tax on dividends

² Piketty and Saez (2006), individual income tax only. Taxpayers ranked excluding capital gains

³ Bach et al. (2012)

It should be noted that effective tax rates vary substantially within the fractiles and percentiles reported in Table 3.2 for both of the adjusted profits scenarios (Appendix 6). Most of the spread in rates for taxpayers with similar incomes likely arises from imputing undeclared distributed profits, which substantially lowers effective rates for taxpayers with capital income. The spread

⁴⁷ The exact amounts will be obtained pending renewed access to tax agency data.

of rates when profits are not adjusted to national accounts is much smaller; horizontal inequities in this case arise primarily from personal income tax benefits designed to promote savings.⁴⁹

The average effective tax rates in Table 3.2 are not strictly progressive. With the exception of the 2009 unadjusted profits scenario, the richest 0.0001 per cent tend to pay lower rates than the top 0.001 per cent. In the alternative dividend adjustment scenario (Y1_NA_ada), average effective rates are strictly decreasing above the 99-99.5 percentile. Regressive effective tax rates in this case arise from the fact that taxpayers ranked at the top of the Y1_NA_ada distribution have large accrued profits and large differences between their accrued and declared distributed profits. These taxpayers accordingly receive a large upwards adjustment of distributed profits, and these imputed undeclared distributed profits augment the income denominator and hence lower the effective tax rates.

Table 3.2 includes effective individual income tax rates for the US (Piketty and Saez 2006), Germany (Bach et al. 2012), and Colombia (Alvaredo and Londoño Vélez 2013), the only countries to our knowledge for which similar studies have been conducted. These comparisons illustrate that tax regressivity at the very top of the income distribution is not a feature exclusive to Chile. The Colombian and German rates display similar features. As Alvaredo and Londoño Vélez (2013) note, this occurrence is not uncommon in other OECD countries. Regressive tax benefits and exemptions that erode the income tax base in Chile (Jorratt 2009) and other countries contribute to the low top effective income tax rates, as does preferential tax treatment for capital income.

Chilean effective tax rates calculated with declared distributed profits only are similar to or even higher than rates in Germany and the US. However, when profits are adjusted for under-declaration, the resulting Chilean rates are less than half those in the US. The average effective tax rate for Chile's top 0.01 per cent reaches a maximum across the two different adjusted dividends scenarios of only 13 per cent in 2005, whereas the top 0.01 per cent paid 26 per cent in the US and 33 per cent in Germany.

Our estimates of Chilean effective tax rates with adjusted profits are more similar to Colombian rates. Rates in scenario Y1_NA are higher than the Colombian rates, while rates in scenario Y1_NA_ada are lower. For example, the top 0.01 per cent in Chile paid 12-13 per cent in the first scenario but only 3-4 per cent in the second scenario, while the top 0.01 per cent in Colombia paid 7-8 per cent. Two caveats should be kept in mind when comparing the Chilean and Colombian rates. First, Alvaredo and Londoño Vélez (2013) do not adjust incomes to national accounts. Doing so would likely reduce the Colombian rates. However, given that the Chilean tax system creates much stronger incentives than the Colombian tax system to under-declare profits, we believe that comparing the unadjusted Colombian tax rates to adjusted Chilean tax rates is more appropriate than considering unadjusted Chilean rates. Second, the Colombian rates are sensitive to Alvaredo and Londoño Vélez's (2013: 22) assumption that 33 per cent of income reported under the tax agency's category of '*ingresos no constitutivos de renta*' (tax-exempt income) are dividends taxed at the firm level.⁵⁰ They estimate that if dividends instead comprise 75 per cent of income in this category, the average effective tax rate for the top 0.01 per cent would rise from 8 per cent to 14 per cent, which exceeds our maximum estimated rate for Chile of 12 per cent (scenario Y1_NA). Given these caveats, as well as the uncertainty

⁴⁹ Part of the spread likely arises from our imperfect data on interest income; losses were set to zero only after aggregating taxpayers into groups of eleven.

⁵⁰ The authors do not explain this assumption. Dividends in Colombia, as in Argentina and many other countries, are taxed only at the firm level.

regarding the actual distribution of undeclared profits in Chile, it is difficult to ascertain whether effective tax rates are actually higher or lower than in Colombia.

Table 3.3 displays the shares of total income tax revenue (excluding corporate tax on retained profits) collected from the top fractiles and percentiles. These figures are less sensitive to the income definitions and adjustment procedures employed; differences arise primarily from the distinct rankings of taxpayers. Shares for the top 0.001 per cent and 0.01 per cent are similar in Chile and Germany: 2.8 per cent in Germany and 1.7–3.1 per cent in Chile for 2005. However, the share collected from the top 0.0001 per cent in Germany (1.2 per cent) is significantly higher than in Chile (0.4–0.7 per cent), while the share collected from the top 1 per cent is significantly larger in Chile (65.6–73.4 per cent) than in Germany (26.8 per cent), given the greater concentration of income and the higher income tax threshold in Chile.

Table 3.3: Shares of total income tax revenue collected from top fractiles (excluding corporate tax on retained profits)

Income denominator	Y1		Y1_NA		Y1_NA_ada		Germany ¹
	2005	2009	2005	2009	2005	2009	2005
Top 0.0001%	0.77	0.49	0.69	0.48	0.42	0.10	1.2
Top 0.001%	3.14	2.24	2.72	1.99	1.65	0.58	2.8
Top 0.01%	10.13	7.83	8.21	7.15	5.62	3.94	6.0
Top 0.1%	31.55	26.47	24.54	21.28	20.96	17.27	12.5
Top 1%	73.39	67.37	67.04	57.86	65.56	60.09	26.8
P 99.99-100	10.13	7.83	8.21	7.15	5.62	3.94	
P 99.9-99.99%	21.42	18.64	16.33	14.13	15.34	13.34	
P 99.5-99.9%	27.96	26.32	25.11	21.31	27.06	25.49	
P 99-99.5%	13.88	14.58	17.38	15.27	17.54	17.33	

¹ Bach et al (2012)

Table 3.4 displays average effective tax rates defined as all taxes paid during the year divided by all income accrued during the year (i.e. using income Y2 in the denominator, which substitutes accrued profits for distributed profits). Average effective rates at the top are under 19 per cent.

Table 3.4: Effective tax rates (%), including corporate tax on retained profits

Income denominator	Y2_ad		USA ¹
	2005	2009	2004
Ranked by			
Top bracket	18.18	14.48	NA
Top 0.001%	16.34	15.54	NA
Top 0.01%	16.91	16.67	31.2
Top 0.1%	17.83	17.58	29.2
Top 1%	15.58	16.06	24.3
P 99.99-100%	16.91	16.67	30.8
P 99.9-99.99%	18.68	18.51	30.0
P 99.5-99.9%	15.96	16.79	28.1
P 99-99.5%	11.33	12.52	25.1

* Effective tax rates are essentially unchanged when imputed accrued pensions are substituted for pension payments received

¹ Piketty and Saez (2006), including both individual income tax and corporate tax. The denominator used to calculate effective rates includes only realized income.

Table 3.5: Shares of total income tax revenue collected from top fractiles, including corporate tax on retained profits

Income denominator	Y2	
	2005	2009
Top 0.0001%	3.22	3.87
Top 0.001%	6.78	7.79
Top 0.01%	15.69	15.30
Top 0.1%	34.38	31.83
Top 1%	70.62	67.50
P 99.99-100%	15.69	15.30
P 99.9-99.99%	18.68	16.53
P 99.5-99.9%	15.96	22.49
P 99-99.5%	11.33	13.19

The average tax rates reported for the top fractiles and percentiles again mask significant variation of rates within these groups. This variation is due largely to the fact that total income tax liabilities (individual plus corporate) for the year do not correspond directly to income definition Y2 (profits accrued during the year in question, which may or may not be distributed); the individual income tax reflects distributed profits, while the corporate tax reflects accrued profits. As such, taxpayers with large distributed profits but few accrued profits (or significant losses) have very high effective tax rates calculated with income denominator Y2. Even when obvious outliers of these types are eliminated, variation of rates among taxpayers with similar incomes remains high. In addition to the distinct tax treatment of retained versus distributed profits, loss carry-forward or carry-back and use of other tax benefits contribute to the apparent horizontal inequities in these effective tax rates.

For comparative context, Table 3.4 also displays average effective tax rates for the US calculated by Piketty and Saez (2006), the only study of which we are aware that fully includes corporate tax in analysing top fractile tax incidence.⁵² The Chilean rates are roughly one half to two thirds of the US rates. When comparing the Chilean and US effective tax rates, however, it should be kept in mind that Piketty and Saez's (2006) corporate tax incidence assumptions and imputation methods differ from ours. They impute corporate taxes paid in proportion to individuals' realised capital income, including dividends, capital gains, and interest; whereas we impute corporate taxes paid in proportion to ownership of accrued profits, which we judge more appropriate for Chile.⁵³ It should also be noted that Piketty and Saez (2006) do not impute reinvested corporate profits in their analysis, since they maintain that realised capital gains on stocks in the US are of comparable magnitude. The Chilean context is very different, given that few companies are publicly traded, only 35 per cent of profits are distributed annually according to tax return data, and total reported capital gains are less than 2 per cent of reported accrued profits.

Conclusion

To restate this study's main findings, income is very concentrated in Chile, particularly when retained profits are incorporated into the analysis. Our results indicate that top income shares in

⁵² Bach et al. (2012) include a local business tax for Germany, but they do not appear to impute national corporate taxes on undistributed profits.

⁵³ We treat the portion of corporate tax corresponding to pension and insurance funds in a similar manner as Piketty and Saez (2006), imputing this amount in proportion to taxpayers' wage and pension income.

Chile – whether profits are adjusted to national accounts or not – are among the highest of those countries that have so far been analysed with similar methods. Meanwhile, effective tax rates paid by citizens at the top of the income distribution are very low by OECD standards when declared incomes are adjusted to national accounts, and comparable to Colombia’s remarkably low effective tax rates - though higher in some scenarios. Effective rates in Chile that include imputed corporate income taxes reach only two thirds of US rates.

We hope to extend our research on inequality and taxation in Chile during the coming year. Our ultimate goal is to build panel datasets, extending forward and backward from the two years for which we currently have data. Another key objective is to obtain more complete information on business ownership so that we can more accurately impute retained accrued profits.

Beyond this Chilean research agenda, our analysis highlights the need for more research in three areas. First, more efforts to analyse the distribution of capital income – whether realised or not – could make a significant contribution to our understanding of inequality around the globe, although data constraints will likely remain problematic. As the Chilean case illustrates, realised capital income may correlate only roughly with unrealised capital income at the top of the distribution. Second, more analysis of how tax systems affect income definitions across countries (or over time) is in order; the literature is beginning to engage with these questions more extensively. In the Chilean case, the structure of income tax creates a particular set of incentives that must be taken into account in order to estimate income shares and effective tax rates that are more or less comparable with other countries. Additional attention to income comparability issues and ways to arrive at greater cross-national systemisation will become increasingly important as top incomes are analysed in more developing countries. Third, the top incomes literature could fruitfully expand to include more analyses of effective tax rates paid by the rich and super-rich. We are aware of only a handful of studies that engage in such analysis. This line of inquiry could help to shed light on the relationship between taxation and inequality within the top of the income distribution, and could serve as a valuable input for policy debates on tax reform.

To that end, we hope that this study and future extensions of this project will inform tax reform initiatives in Chile. The evidence presented in this paper supports the view that there is substantial room to increase taxes on the rich in Chile. Such initiatives could contribute to reducing inequality, both by raising more revenue to finance social spending, and by helping to curtail the growth of top incomes – a point that has been made in the broader top incomes literature (Saez 2004; Atkinson et al. 2010).

Finally, we reiterate our thanks to Chile’s Servicio de Impuestos Internos, and hope that tax agencies across Latin America will adopt policies of greater openness to allowing academics to access anonymous tax return microdata. The potential benefits for policymaking and for strengthening tax administration and state capacity more broadly in developing countries should not be underestimated. As Chaudhry (1997) noted in her renowned study of oil-dependent nations, analysing tax records can play a critical role in keeping the state informed about society and its economic activities, which is critical not only for tax policy formulation and effective tax administration, but also for economic policymaking much more broadly.

Appendices

Appendix 1 Adjusting for undeclared income

Independent work

To adjust independent work income in our datasets, we first use Chilean household surveys (CASEN) to estimate the portion of the national accounts figure that accrues to individuals who did not file tax returns. We assume that non-filers did not earn enough to owe income taxes. While some non-filers may be tax evaders, we believe it is highly unlikely that the tax agency lacks records on any independent workers who belong to the ranks of Chile's top income earners. The amount of independent work income calculated from CASEN that corresponds to the same number of individuals who file tax returns exceeds the tax agency figure. We impute the difference to taxpayers in proportion to their declared independent work income.

For this procedure, we rank the household survey data by independent work income. If we rank the survey data by total income instead and match to tax-filers on that basis, the adjustment amount changes only marginally.

Distributed profits

a) Imputing undeclared profits in proportion to declared distributed profits

This procedure does not alter the distribution of declared distributed profits. When using this approach, we would ideally first subtract from the declared values those profits distributed directly to individual taxpayers by publicly-traded corporations. These dividends are not subject to under-declaration, because the tax agency checks amounts reported by shareholders against records provided by these corporations, which are disinterested third parties (unlike closed companies). However, the vast majority (at least 90 per cent) of shareholders in publicly-traded companies are businesses, not individuals. The potential for bias in our adjustment procedure associated with inflating dividends from publicly-traded corporations that were not under-declared is thereby minimal. (Moreover, we lack information to distinguish dividends paid by publicly-traded companies from profits distributed by other firms.) The owners of privately-held businesses that receive dividends from publicly-traded corporations may in turn access those dividends without declaring distributed profits to the tax agency. In fact, the low prevalence of direct individual ownership in publicly-traded companies likely reflects the avoidance and evasion incentives created by the income tax system.

b) Imputing in proportion to the difference between accrued and declared distributed profits

This approach entails allocating undeclared distributed profits estimated from national accounts to taxpayers in our unadjusted datasets who have positive differences between their accrued profits and their distributed profits. The assumption here is that taxpayers with large accrued profits who declare very few distributed profits are engaged in evasion. This approach captures the inherent incentives that the tax system creates for under-declaring dividends, yet it of course fails to distinguish taxpayers who actually do reinvest their profits in the firm from those who do so only on paper.

Taxpayers with net losses (instead of positive accrued profits) receive no imputed undeclared distributed profits. Likewise, taxpayers whose declared distributed profits exceed their accrued profits receive no imputed distributed profits. Among the population of taxpayers with positive accrued profits whose declared distributed profits are of a smaller value, we allocate undeclared distributed profits in proportion to the distribution of total net positive differences between accrued and distributed profits in the unadjusted datasets:

$$\text{Adjustment for taxpayer}_i = (P_{D_NA} - P_{D_SII}) * \max[0, (P_{+A_i} - P_{D_i})] / (P_{+A} - P_D)$$

Where:

P_{+A} = positive unadjusted accrued profits

P_D = unadjusted distributed profits (positive by definition)

P_{D_NA} = total value of distributed profits from national accounts

P_{D_SII} = total value of distributed profits declared to the tax agency (SII)

In contrast to adjustment method (a), method (b) alters the distribution of distributed profits substantially. Because the value of imputed undeclared profits is so large, the adjusted distribution is very close to the distribution of positive accrued profits.

Accrued profits

The national accounts figure was obtained starting from the gross operating surplus, subtracting fixed capital consumption (depreciation), subtracting imputed home-owner rent and mixed income, adding net interest, royalties, and rent payments, and finally subtracting the state-owned copper company's operating surplus. For 2009, due to changes in national accounts formatting, we must also subtract mixed income (independent work and sole proprietorship). To this figure, we add back sole proprietorship income from tax agency figures; this amount cannot be distinguished from independent work in the national accounts figures.

We attribute the full difference between the national accounts and tax agency figures to domestic businesses only. The rationale is that mining companies account for the majority of foreign-owned profits (roughly 95 per cent), and national accounts figures obtain data on this sector's profits directly from these companies' public balance sheets. Any evasion that these foreign companies engage in is therefore not captured in the national accounts figure. Applying this adjustment procedure yields accrued domestic profits of 23 per cent GDP for 2005 and 24 per cent GDP for 2009.

We impute the difference between the national accounts and tax agency figures only to taxpayers in our unadjusted database with net positive accrued profits. Taxpayers with net losses receive no adjustment, for lack of any information that could be used to discern a reasonable distribution. As usual, we then assume that the distribution of the accrued profits we must impute from national accounts follows the distribution of the positive accrued profits in our unadjusted datasets.

As noted in the article text, this procedure likely overestimates accrued profits at the top of the distribution. Pending renewed access to tax agency files, we plan to assess an alternative approach that entails using information on the distribution of businesses' gross earnings as the basis for the adjustment. This option has the advantage that accrued net losses will receive a positive adjustment along with accrued net profits. This positive adjustment for net losses is desirable given that our estimates of accrued profits do not correct for tax benefits associated with depreciation, which may account for some of the large negative values in our datasets.

Appendix 2 Assessing the effects of ranking shifts on income shares

RY_a Dataset: Re-ranking by Y1 2005 (2009)

	Income share ratio: re-ranked rows/original ranking	% difference in income shares	% fractile income moved in	% fractile income moved out	% rows moved in/ out of fractile
Top 0.001%	1 (1.004)	0 (0.36)	0 (5.68)	0 (5.32)	0 (9.09)
Top 0.01%	1.000 (1.000)	0.049 (0.04)	1.72 (1.15)	1.67 (1.11)	3.06 (1.91)
Top 0.1%	1.000 (1.001)	0.040 (0.09)	1.31 (2.12)	1.27 (2.03)	2.25 (3.61)
Top 1%	1.001 (1.001)	0.057 (0.09)	1.35 (1.90)	1.29 (1.81)	2.26 (3.10)
Top 10%	1.000 (1.001)	0.003 (0.07)	0.01 (0.91)	0.01 (0.84)	0.03 (2.10)

RY_b Dataset: Re-ranking by Y1_NA 2005 (2009)

	Income share ratio: re-ranked rows/original ranking	% difference in income shares	% fractile income moved in	% fractile income moved out	% rows moved in/ out of fractile
Top 0.001%	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)
Top 0.01%	1.000 (1.000)	0.028 (0.00)	0.53 (1.06)	0.51 (1.04)	1.02 (1.90)
Top 0.1%	1.000 (1.000)	0.042 (0.03)	1.46 (1.00)	1.42 (0.97)	2.56 (1.71)
Top 1%	1.000 (1.000)	0.040 (0.05)	0.94 (0.95)	0.90 (0.91)	1.87 (1.84)
Top 10%	1.000 (1.000)	0.018 (0.02)	0.30 (0.28)	0.30 (0.27)	1.00 (0.83)

RY_c Dataset: Re-ranking by Y1_NA_ada 2005 (2009)

	Income share ratio: re-ranked rows/original ranking	% difference in income shares	% fractile income moved in	% fractile income moved out	% rows moved in/ out of fractile
Top 0.001%	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)
Top 0.01%	1.000 (1.000)	0.038 (0.024)	0.72 (0.60)	0.68 (0.58)	2.04 (1.90)
Top 0.1%	1.001 (1.001)	0.135 (0.121)	1.82 (1.13)	1.69 (1.01)	4.50 (2.85)
Top 1%	1.003 (1.002)	0.266 (0.220)	2.34 (1.75)	2.08 (1.52)	5.03 (3.68)
Top 10%	1.002 (1.003)	0.218 (0.026)	0.83 (0.70)	0.62 (0.44)	1.92 (1.36)

RY_c Dataset: Re-ranking by Y2 2005 (2009)

	Income share ratio: re-ranked rows/original ranking	% difference in income shares	% fractile income moved in	% fractile income moved out	% rows moved in/ out of fractile
Top 0.001%	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)
Top 0.01%	1.001 (1.001)	0.050 (0.095)	1.02 (1.31)	1.08 (1.42)	3.06 (4.76)
Top 0.1%	1.003 (1.002)	0.293 (0.210)	2.10 (1.69)	2.38 (1.90)	6.55 (5.32)
Top 1%	1.006 (1.005)	0.635 (0.536)	3.58 (3.89)	4.20 (4.44)	8.99 (9.55)
Top 10%	1.001 (1.001)	0.078 (0.088)	0.90 (0.98)	0.97 (1.02)	2.65 (2.71)

**RY_c Dataset: Re-ranking by Y2_ad
2005 (2009)**

	Income share ratio: re-ranked rows/original ranking	% difference in income shares	% fractile income moved in	% fractile income moved out	% rows moved in/ out of fractile
Top 0.001%	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)
Top 0.01%	1.000 (1.000)	0.000 (0.025)	1.10 (0.61)	1.08 (0.58)	3.06 (1.90)
Top 0.1%	1.001 (1.001)	0.065 (0.056)	1.46 (1.11)	1.40 (1.06)	3.79 (3.80)
Top 1%	1.002 (1.001)	0.172 (0.090)	1.88 (1.87)	1.74 (1.75)	4.38 (4.28)
Top 10%	1.000 (1.000)	0.038 (0.049)	0.65 (0.73)	0.61 (0.68)	1.95 (2.11)

**RY_c Dataset: Re-ranking by Y2_aa
2005 (2009)**

	Income share ratio: re-ranked rows/original ranking	% difference in income shares	% fractile income moved in	% fractile income moved out	% rows moved in/ out of fractile
Top 0.001%	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)
Top 0.01%	1.000 (1.001)	0.039 (0.076)	1.01 (1.03)	1.05 (1.11)	3.06 (3.81)
Top 0.1%	1.001 (1.001)	0.121 (0.096)	1.46 (1.11)	1.59 (1.20)	4.71 (3.61)
Top 1%	1.002 (1.003)	0.249 (0.255)	2.24 (2.34)	2.51 (2.58)	6.19 (6.32)
Top 10%	1.000 (1.001)	0.048 (0.062)	0.66 (0.73)	0.71 (0.79)	2.15 (2.29)

**RY_c Dataset: Re-ranking by Y2_NA
2005 (2009)**

	Income share ratio: re-ranked rows/original ranking	% difference in income shares	% fractile income moved in	% fractile income moved out	% rows moved in/ out of fractile
Top 0.001%	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)
Top 0.01%	1.000 (1.000)	0.016 (0.015)	0.36 (0.55)	0.35 (0.55)	1.02 (1.91)
Top 0.1%	1.000 (1.000)	0.000 (0.035)	0.22 (0.75)	0.22 (0.72)	0.61 (2.18)
Top 1%	1.000 (1.000)	0.032 (0.031)	0.38 (0.87)	0.37 (0.81)	1.09 (2.51)
Top 10%	1.000 (1.000)	0.007 (0.020)	0.22 (0.40)	0.21 (0.38)	0.83 (1.49)

Appendix 3 Composition of top incomes, 2005 (2009)

Income Sources, % Y1

	Wages and pensions	Independent work	Interest	Rent	Distributed profits	Ratio of unadjusted distributed profits to accrued profits
Top 0.0001%	1.31 (20.73)	26.32 (40.17)	0.07 (5.270)	0.03 (0.00)	72.27 (33.83)	34.25 (23.21)
Top 0.001%	20.27 (41.41)	22.99 (23.85)	0.09 (1.94)	1.67 (0.37)	54.95 (32.30)	19.55 (29.94)
Top 0.01%	41.44 (53.51)	18.94 (15.79)	0.23 (1.12)	0.93 (0.28)	38.47 (29.31)	20.53 (24.17)
Top 0.1%	58.30 (64.08)	11.35 (10.37)	0.31 (0.72)	0.49 (0.21)	29.55 (24.61)	24.25 (28.30)
Top 1%	61.12 (65.58)	12.54 (11.26)	0.24 (0.53)	0.27 (0.16)	25.83 (22.47)	31.69 (33.53)
Top 10%	73.40 (75.34)	10.94 (9.74)	0.19 (0.42)	0.19 (0.14)	15.28 (14.37)	36.80 (37.90)
Top 0.001-0.0001%	27.35 (46.49)	21.75 (19.97)	0.10 (1.14)	2.32 (0.45)	48.47 (31.94)	15.78 (32.29)
Top 0.01-0.001%	50.81 (57.75)	17.14 (12.93)	0.29 (0.83)	0.59 (0.24)	31.17 (28.25)	21.36 (22.42)
Top 0.1-0.01%	64.56 (67.74)	8.54 (8.50)	0.34 (0.59)	0.32 (0.19)	26.24 (22.99)	26.90 (30.62)
Top 0.5-0.1%	61.04 (64.88)	12.96 (12.23)	0.23 (0.50)	0.19 (0.14)	25.57 (22.25)	34.63 (34.87)
Top 1-0.5%	63.39 (67.50)	12.95 (10.79)	0.18 (0.42)	0.20 (0.15)	23.28 (21.14)	38.95 (37.77)

Income Sources, % Y1_NA

	Wages and pensions	Independent work	Interest	Rent	Distributed profits
Top 0.0001%	0.53 (0.77)	2.12 (4.65)	0.12 (0.17)	0.00 (0.00)	97.23 (94.41)
Top 0.001%	2.86 (5.29)	6.65 (8.95)	0.12 (0.22)	0.48 (0.02)	21.59 (85.53)
Top 0.01%	7.47 (9.76)	7.71 (6.92)	0.11 (0.53)	0.37 (0.08)	84.33 (82.71)
Top 0.1%	13.62 (13.49)	4.98 (4.73)	0.14 (0.37)	0.21 (0.08)	81.06 (81.33)
Top 1%	24.97 (23.01)	6.29 (6.19)	0.16 (0.33)	0.15 (0.09)	68.44 (70.38)
Top 10%	53.96 (52.72)	9.77 (10.10)	0.15 (0.32)	0.14 (0.10)	35.97 (36.75)
Top 0.001-0.0001%	4.04 (0.77)	8.94 (4.65)	0.12 (0.24)	0.72 (0.02)	86.18 (82.79)
Top 0.01-0.001%	9.92 (6.68)	8.28 (10.27)	0.11 (0.64)	0.31 (0.11)	81.39 (81.63)
Top 0.1-0.01%	16.20 (14.91)	3.83 (3.89)	0.15 (0.30)	0.14 (0.08)	79.68 (80.81)
Top 0.5-0.1%	22.18 (19.84)	4.32 (4.33)	0.17 (0.31)	0.12 (0.07)	73.20 (75.46)
Top 1-0.5%	39.54 (35.76)	10.25 (10.02)	0.15 (0.32)	0.12 (0.12)	49.93 (53.78)

Income Sources, % Y2_ad

	Wages and pensions	Independent work	Interest	Rent	Accrued profits	Distributed profits (declared)	Capital gains
Top 0.0001%	0.05 (0.01)	0.86 (0.16)	0.00 (0.00)	0.01 (0.00)	99.08 (99.83)	3.51 (0.64)	4.29 (2.72)
Top 0.001%	0.55 (0.40)	1.11 (0.53)	0.02 (0.04)	0.02 (0.00)	98.30 (99.04)	7.51 (1.98)	1.85 (7.43)
Top 0.01%	2.29 (2.66)	2.03 (1.60)	0.07 (0.23)	0.10 (0.02)	95.52 (95.49)	9.75 (6.88)	1.70 (5.84)
Top 0.1%	7.58 (9.33)	2.70 (2.23)	0.12 (0.30)	0.13 (0.06)	89.37 (88.08)	16.70 (14.33)	1.34 (3.34)
Top 1%	23.25 (25.87)	4.78 (4.61)	0.17 (0.36)	0.14 (0.09)	71.66 (69.07)	21.66 (19.91)	0.62 (1.44)
Top 10%	53.38 (55.64)	8.08 (7.26)	0.16 (0.35)	0.14 (0.11)	38.24 (36.64)	12.54 (11.89)	0.28 (0.60)
Top 0.001-0.0001%	0.90 (0.81)	1.28 (0.93)	0.03 (0.08)	0.02 (0.01)	97.78 (98.16)	10.24 (3.42)	0.18 (12.62)
Top 0.01-0.001%	3.62 (5.05)	2.73 (2.75)	0.11 (0.43)	0.17 (0.04)	93.37 (91.72)	11.47 (12.09)	1.59 (4.15)
Top 0.1-0.01%	11.69 (15.02)	3.23 (2.77)	0.16 (0.35)	0.15 (0.09)	84.77 (81.77)	22.10 (20.66)	1.06 (1.21)
Top 0.5-0.1%	25.93 (29.49)	4.01 (4.34)	0.19 (0.39)	0.16 (0.11)	69.71 (65.66)	28.07 (26.22)	0.17 (0.25)
Top 1-0.5%	44.40 (47.07)	9.20 (8.75)	0.21 (0.42)	0.14 (0.13)	46.06 (43.63)	20.42 (20.00)	0.12 (0.08)

Income Sources, % Y2_NA

	Wages and pensions	Independent work	Interest	Rent	Accrued profits	Distributed profits (declared)	Capital gains
Top 0.0001%	0.03 (0.01)	0.56 (0.11)	0.00 (0.00)	0.01 (0.00)	99.41 (99.88)	1.92 (0.31)	2.34 (1.30)
Top 0.001%	0.30 (0.19)	0.72 (0.36)	0.01 (0.02)	0.01 (0.00)	98.96 (99.43)	4.11 (0.94)	1.01 (3.56)
Top 0.01%	1.18 (1.17)	1.31 (1.10)	0.02 (0.10)	0.05 (0.01)	97.44 (97.62)	5.42 (3.35)	0.94 (2.84)
Top 0.1%	4.08 (4.44)	1.81 (1.61)	0.07 (0.15)	0.08 (0.03)	93.97 (93.77)	9.57 (7.31)	0.76 (1.69)
Top 1%	13.92 (13.94)	3.50 (3.75)	0.10 (0.20)	0.09 (0.05)	82.40 (82.05)	13.60 (11.35)	0.39 (0.81)
Top 10%	39.83 (38.57)	7.22 (7.37)	0.12 (0.25)	0.11 (0.07)	52.72 (53.73)	9.41 (8.32)	0.21 (0.42)
Top 0.001-0.0001%	0.49 (0.40)	0.83 (0.64)	0.02 (0.04)	0.01 (0.00)	98.65 (98.92)	5.62 (1.65)	0.10 (6.06)
Top 0.01-0.001%	1.87 (2.26)	1.77 (1.91)	0.03 (0.18)	0.08 (0.02)	96.25 (95.63)	6.45 (5.99)	0.03 (2.05)
Top 0.1-0.01%	6.45 (7.43)	2.22 (2.07)	0.10 (0.19)	0.10 (0.04)	91.13 (90.26)	12.96 (10.93)	0.61 (0.63)
Top 0.5-0.1%	15.51 (16.17)	2.91 (3.56)	0.12 (0.23)	0.10 (0.06)	81.36 (79.98)	17.88 (15.30)	0.11 (0.13)
Top 1-0.5%	30.89 (29.97)	7.79 (8.47)	0.15 (0.27)	0.10 (0.8)	61.07 (61.21)	14.71 (13.39)	0.09 (0.07)

Appendix 4 Top incomes: shares within shares, 2005 (2009)

Y1 incomes (distributed profits)

	Y1 shares within		Y1_NA shares within		Y1_NA_ada shares within		Y1_NA_ada' shares within	
	Top 1%	Top 10%	Top 1%	Top 10%	Top 1%	Top 10%	Top 1%	Top 10%
0.0001%	0.58 (0.33)	0.18 (0.10)	0.97 (0.49)	0.38 (0.19)	2.89 (5.00)	1.17 (2.05)	4.56 (7.40)	1.85 (3.15)
0.001%	2.15 (1.72)	0.67 (0.52)	2.89 (2.08)	1.13 (0.80)	7.17 (9.53)	2.90 (3.90)	10.3 (13.9)	4.32 (5.90)
0.01%	6.99 (6.54)	2.20 (1.99)	8.35 (7.55)	3.27 (2.92)	16.6 (18.5)	6.73 (7.58)	22.9 (25.1)	9.58 (10.7)
0.1%	25.8 (25.4)	8.12 (7.75)	28.2 (27.3)	11.1 (10.6)	38.6 (40.0)	15.6 (16.4)	46.4 (47.8)	19.4 (20.4)
1%	100	31.4 (30.5)	100	39.2 (38.6)	100	40.5 (41.0)	100	41.8 (42.6)

Y2 incomes (accrued profits)

	Y2 shares within		Y2_ad shares within		Y2_aa shares within		Y2_NA shares within	
	Top 1%	Top 10%	Top 1%	Top 10%	Top 1%	Top 10%	Top 1%	Top 10%
0.0001%	3.91 (6.35)	1.44 (2.33)	3.06 (4.95)	1.28 (2.02)	4.59 (7.54)	1.99 (3.24)	4.56 (5.82)	1.75 (2.95)
0.001%	9.16 (11.9)	3.37 (4.37)	7.54 (9.43)	3.15 (3.85)	10.76 (14.1)	4.67 (6.06)	8.53 (11.1)	4.30 (5.61)
0.01%	20.5 (21.8)	7.52 (8.00)	17.3 (18.3)	7.24 (7.49)	23.7 (25.5)	10.3 (10.9)	19.4 (21.1)	9.79 (10.7)
0.1%	42.6 (43.1)	15.6 (15.8)	39.6 (39.9)	16.6 (16.3)	47.6 (48.3)	20.7 (20.7)	43.2 (44.3)	21.8 (22.5)
1%	100	36.8 (36.7)	100	41.8 (40.9)	100	43.4 (43.0)	100	50.5 (50.8)

Appendix 5: Average incomes and income thresholds

Y1

	Chilean pesos				USD			
	Average income		Threshold		Average income		Threshold	
	2005	2009	2005	2009	2005	2009	2005	2009
Top 0.0001%	2,756,727,378	2,149,063,140	1,795,894,443	1,596,413,500	4,942,879	3,911,135	3,220,082	2,905,354
Top 0.001-0.0001%	820,095,454	904,518,379	501,481,445	633,083,121	1,470,451	1,646,156	899,168	1,152,164
Top 0.01-0.001%	260,106,932	335,430,229	187,978,489	239,448,182	466,378	610,458	337,050	435,778
Top 0.1-0.015	101,271,514	130,013,620	72,039,594	91,193,768	181,582	236,615	129,169	165,966
Top 0.5-0.1%	39,811,977	62,480,165	38,167,187	49,402,507	71,384	113,709	68,435	89,909
Top 1-0.5%	32,565,451	42,534,681	28,197,132	37,167,633	58,391	77,410	50,558	67,642
Top 0.0001%	2,756,727,378	2,149,063,140			4,942,879	3,911,135		
Top 0.001%	1,013,758,647	1,017,658,812			1,817,694	1,852,063		
Top 0.01%	337,010,168	406,901,795			604,267	740,531		
Top 0.1%	124,917,766	157,623,552			223,981	286,863		
Top 1%	48,329,283	62,021,762			86,656	112,875		
Top 10%	15,382,291	20,335,763			27,581	37,010		

Y1_NA

	Chilean pesos				USD			
	Average income		Threshold		Average income		Threshold	
	2005	2009	2005	2009	2005	2009	2005	2009
Top 0.0001%	25,271,948,816	5,598,497,017	1,044,897,589	3,127,500,696	45,313,212	10,188,848	1,873,527	5,691,819
Top 0.001-0.0001%	421,225,402	1,813,177,012	140,202,776	1,259,596,029	755,267	3,299,847	251,387	2,292,371
Top 0.01-0.001%	105,511,733	661,495,116	46,771,201	448,180,843	189,185	1,203,872	83,862	815,656
Top 0.1-0.015	46,324,469	237,097,389	43,312,277	169,142,968	83,061	431,500	77,660	307,828
Top 0.5-0.1%	17,143,645	113,247,161	6,833,980	83,362,896	30,739	206,101	12,253	151,714
Top 1-0.5%	8,597,578	66,586,692	5,899,319	54,432,378	15,416	121,183	10,578	99,063
Top 0.0001%	25,271,948,816	5,598,497,017			45,313,212	10,188,848		
Top 0.001%	6,229,073,946	2,157,297,013			11,168,879	3,926,120		
Top 0.01%	1,461,990,318	818,198,172			2,621,384	1,489,060		
Top 0.1%	335,199,920	295,041,912			601,022	536,954		
Top 1%	84,558,115	108,096,402			151,615	196,727		
Top 10%	20,235,263	27,976,632			36,282	50,915		

Y2_ad

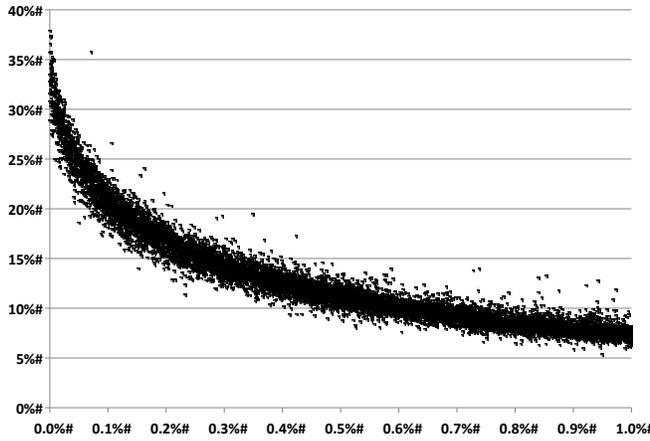
	Chilean pesos				USD			
	Average income		Threshold		Average income		Threshold	
	2005	2009	2005	2009	2005	2009	2005	2009
Top 0.0001%	25,271,948,816	56,412,287,963	1,044,897,589	11,742,069,805	45,313,212	102,666,169	1,873,527	21,369,694
Top 0.001-0.0001%	421,225,402	5,110,525,776	140,202,776	2,664,920,597	755,267	9,300,777	251,387	4,849,957
Top 0.01-0.001%	105,511,733	1,079,916,820	46,771,201	613,841,077	189,185	1,965,368	83,862	1,117,145
Top 0.1-0.015	46,324,469	259,132,258	43,312,277	158,439,889	83,061	471,601	77,660	288,349
Top 0.5-0.1%	17,143,645	94,695,374	6,833,980	66,823,693	30,739	172,339	12,253	121,614
Top 1-0.5%	8,597,578	54,363,468	5,899,319	45,668,838	15,416	98,937	10,578	83,114
Top 0.0001%	25,271,948,816	56,412,287,963			45,313,212	102,666,169		
Top 0.001%	6,229,073,946	9,774,322,339			11,168,879	17,788,540		
Top 0.01%	1,461,990,318	1,990,759,303			2,621,384	3,623,034		
Top 0.1%	335,199,920	431,801,622			601,022	785,847		
Top 1%	84,558,115	108,240,046			151,615	196,989		
Top 10%	20,235,263	26,491,179			36,282	48,212		

Y2_NA

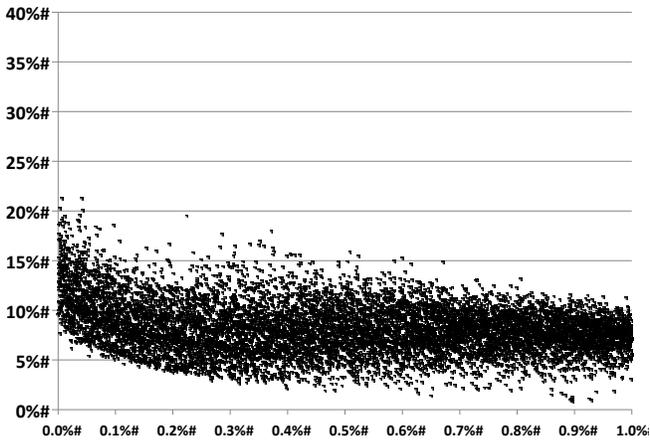
	Chilean pesos				USD			
	Average income		Threshold		Average income		Threshold	
	2005	2009	2005	2009	2005	2009	2005	2009
Top 0.0001%	46,297,995,325	118,211,956,433	18,149,560,075	24,412,133,934	83,013,420	215,136,970	32,542,598	44,428,268
Top 0.001-0.0001%	7,493,760,347	10,633,300,947	4,105,956,111	5,572,295,754	13,436,493	19,351,817	7,362,078	10,141,164
Top 0.01-0.001%	1,646,544,104	2,182,726,743	919,981,993	1,228,015,105	2,952,293	3,972,400	1,649,550	2,234,896
Top 0.1-0.015	360,375,536	495,801,807	211,512,455	291,348,556	646,162	902,322	379,247	530,233
Top 0.5-0.1%	97,504,301	165,367,443	78,346,112	108,837,656	174,828	300,956	140,476	198,076
Top 1-0.5%	59,220,807	82,889,647	46,175,105	64,547,051	106,184	150,853	82,793	117,471
Top 0.0001%	46,297,995,325	118,211,956,433			83,013,420	215,136,970		
Top 0.001%	11,374,183,844	20,413,178,718			20,394,185	37,150,467		
Top 0.01%	2,639,160,404	4,092,583,617			4,732,078	7,448,198		
Top 0.1%	588,953,752	854,455,264			1,056,008	1,555,045		
Top 1%	136,388,041	193,037,327			244,547	351,314		
Top 10%	27,040,882	38,014,716			48,485	69,184		

Appendix 6: Effective tax rates, top 1%, 2005 (excluding corporate tax on retained profits)
(Horizontal axis: income ranking within cumulative top percentile of adults)

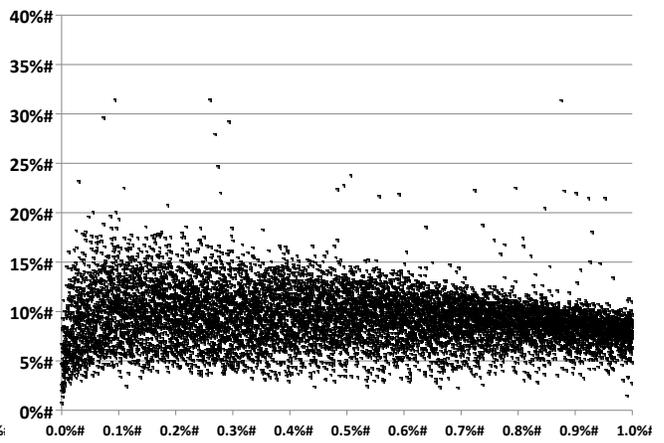
Y1



Y1_NA*



Y1_NA_ada*



*Outliers above 40% excluded

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