

## TOP INCOME SHARES, BUSINESS PROFITS, AND EFFECTIVE TAX RATES IN CONTEMPORARY CHILE

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We contribute to research on inequality and world top incomes by presenting the first calculations of Chilean top income shares and effective tax rates using individual tax return microdata from 2005 and 2009. We pay special attention to business income, which dominates at the top. Our analysis includes not only distributed profits, but also the large proportion of accrued profits retained by firms, which are rarely analyzed given the difficulty of identifying individual owners. Our most conservative top 1 percent income-share estimate is 15 percent—the fifth highest in the top incomes literature. When distributed profits are adjusted for evasion, the top 1 percent share reaches 22–26 percent. When we broaden the income concept to include accrued profits, which we impute to taxpayers using ownership shares calculated from business tax forms, the top 1 percent share increases to a minimum of 23 percent. Despite this impressive income concentration, the top 1 percent pays modest average effective income-tax rates of 15–16 percent.

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### 1. INTRODUCTION

Latin America has long been recognized as the region characterized by the world's most extreme levels of inequality. A growing body of research in economics and political science strives to understand the causes and consequences of inequality in Latin America (Goñi *et al.*, 2011; Haggard and Kaufman, 2012; Schneider, 2013), as well as prospects for redistribution and equitable development (Huber and Stephens, 2012; Fairfield, 2015). However, most empirical research on inequality in Latin America draws on household surveys, which fail to capture information about the very rich. Atkinson and Piketty (2009, 2010) and their collaborators have demonstrated that income tax return data provide far more accurate information on top income shares, even where under-reporting is

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widespread. To date, however, only a handful of developing countries have been analyzed in this literature, given the difficulty researchers have faced in obtaining access to detailed income-tax return data.<sup>1</sup>

This paper contributes to research and public debate on inequality and redistribution and helps broaden the scope of developing countries analyzed in the top incomes literature by estimating Chilean income shares and effective tax rates from original new datasets 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.<sup>2</sup> We are therefore able to directly report income shares and effective tax rates for top-income fractiles without recourse to fitting or extrapolation techniques. Our analysis accordingly provides the most accurate description of top income shares, income compositions, and tax rates available for contemporary Chile, a country of special interest in Latin America given its reputation for successful poverty reduction, economic growth, and political stability that have nevertheless coexisted with high levels of inequality and popular disaffection—the 2011–12 student protests forced the issues of inequality and progressive taxation onto the national agenda, and the Bachelet government (2014–) responded with sweeping reforms. Using our two years of microdata in conjunction with the limited tabulated data published by the SII, we also estimate more approximate top shares for 2004–11.

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 realized or not (Atkinson, 2009; Atkinson and Piketty, 2010; Smeeding and Thompson, 2010; Roine and Waldenström, 2012; Piketty and Zucman, 2014). Capital income has long been recognized to augment inequality, but it is rarely analyzed given data limitations and the difficulty of accurately allocating unrealized income. We imputed accrued profits and accumulated retained profits to Chilean taxpayers using ownership shares calculated directly from businesses tax-return forms. Several recent studies have also attempted to impute accrued profits to Chilean taxpayers, but they employ extremely limited information about ownership, and given their reliance on tabulated data, they are unable to rank taxpayers taking accrued profits into account (Agostini *et al.*, 2012; López *et al.*, 2013). These problems are potentially serious; we find that there is significant re-ranking of taxpayers when comparing income definitions that include accrued profits rather than distributed profits; shares of income with accrued profits are substantially higher when taxpayers are ranked according to income including accrued profits as opposed to income including only distributed profits.

<sup>1</sup>A few Latin American countries make limited information available. Argentina publishes statistics for the approximately 3 percent of adults required to file income-tax declarations; the Chilean tax agency has also recently published some highly-aggregated income-tax return data. Colombia is the only country that has provided extended panel microdata for analysis of inequality and tax incidence (Alvaredo and Londoño Vélez, 2013); recent data (2009–11) are now available for Uruguay (Burdín *et al.*, 2014).

<sup>2</sup>By contrast, Chilean tax-agency data provided for Agostini *et al.* (2012) aggregated taxpayers into brackets of 7422 individuals.

Estimating the distribution of retained profits is particularly important in Chile because the country has a unique integrated income tax that creates strong incentives for business owners to avoid formally withdrawing profits. Chile's corporate tax serves as a withholding (an 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 the personal income-tax base, and personal income is subject to progressive marginal tax rates reaching 40 percent. Because the corporate tax (17 percent from 2004 to 2010; currently 20 percent) is much lower than the top personal income-tax rate (40 percent), 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, p. 42). In addition, independent professionals commonly incorporate to avoid paying the much higher personal income tax rates. Retained profits and incorporated income are not always channeled 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, or capital gains can be used to withdraw profits (avoidance). And distributed profits may simply be omitted from tax declarations (evasion). Income-tax evasion is estimated at 46 percent, essentially all of which is associated with distributed profits (Jorratt, 2009, p. 7). It is difficult for the tax agency to detect and control under-declaration of distributed profits because the vast majority of Chilean businesses are organized as partnerships and close corporations, rather than publicly-traded corporations; the small number of publicly-traded corporations (amounting to only 0.05 percent of Chilean firms) are overseen by the Superintendencia de Valores y Seguros and are subject to independent auditing, which minimizes possibilities for evasion. Given these considerations, 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 analyzing 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. Moreover, we include the 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 credited against future personal income tax payments (Engel *et al.*, 1999). However, the corporate tax is not only an important source of revenue in Chile (43–50 percent of total income taxes in recent years), it is in practice the only tax that many corporate profits ever pay, 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 (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-return forms that we obtained in order to estimate ownership shares.

We find 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 analyzing accrued profits prevent us from confidently ranking Chile among the other income-inequality leaders (the U.S., Argentina, Colombia, and South Africa). When only distributed profits are included in the income definition, we conservatively estimate that the top 1 percent of adults receives an income share of 15 percent while the top 0.01 percent receives 1 percent. These shares increase substantially when we adjust distributed profits for under-declaration. Depending on the assumptions employed to impute undeclared profits, estimated shares for 2005 and 2009 range from 22 to 26 percent for the top 1 percent, and 1.6 to 7.4 percent for the top 0.01 percent. When the income definition includes accrued profits instead of distributed profits, top 1 percent shares range from 23 to 26 percent (unadjusted) to 32 to 33 percent (adjusted for under-reporting), while top 0.01 percent shares rise to 5–7 percent (unadjusted) and 9–11 percent (adjusted for under-reporting). Despite this impressive concentration of income, effective income tax rates paid by the richest Chileans are modest. The top 1 percent pays an average effective rate of at most 15–16 percent. Our estimated average effective tax rates, including the corporate tax in the numerator and accrued profits in the denominator, are also 15 percent for the top 1 percent; the effective rate for the U.S. including corporate tax is 24 percent (Piketty and Saez, 2006).

## 2. 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, anonymized 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 authorization for the project.

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; most adults make less than the minimum taxable income given high levels of poverty and inequality. In Chile, approximately 82 percent of individuals earn less than the taxable threshold (Agostini *et al.*, 2012). Nevertheless, individuals registered with the SII comprised 63 percent (67 percent) of adults in 2005 (2009) (many of whom did not receive enough income to owe taxes). Our datasets contain information on all reported income and taxes paid by these individuals. This section describes the key components of our datasets and the methods used to compile them.

### 2.1. *Income and Profits*

Our datasets record income in eight categories: pensions (aggregated private and public), wages, independent work, rent from real estate, interest earnings, taxable capital gains, dividends and distributed profits, and accrued net business profits (Appendix 1). Information on the first seven categories comes directly from forms filed by taxpayers, crosschecked against forms filed by withholding or reporting agents whenever possible. 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. We exclude the many untaxed forms of interest, capital gains, and rent from our analysis for lack of adequate information, as is the norm in the top incomes literature.

Accrued profits—a unique feature of our datasets—were allocated using ownership shares calculated from business tax forms: the ratio of profits distributed to a particular owner to total profits distributed by the firm. After multiple iterations to trace through interlocking business ownership, 49 percent (45 percent) of the total accrued profits for 2005 (2009) were imputed to Chilean taxpayers, 31 percent (37 percent) to foreign owners, and 3 percent (2 percent) to funds managed by pension and mutual administrators. Profits imputed to foreigners are omitted from our dataset; profits accrued to pension funds were imputed in proportion to taxpayers' pension and wage income (see Appendix 1). We lack ownership information to impute the remaining 17 percent (16 percent) of profits reported to the tax agency in 2005 (2009). We employ three alternative approaches for handling these residual profits. The first is to simply omit them. The second entails imputing these residual 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. While all of these approaches are ad hoc, they provide a rough estimate of the uncertainty surrounding the distribution of accrued profits.

Our datasets also include retained profits accumulated since 1984, as reported in businesses' "Taxable Profit Fund" (*Fondo de Utilidades Tributables*, FUT) ledgers. These retained profits were imputed to individual taxpayers using the same ownership shares calculated as described above. The tax agency uses the FUT, which was created in 1984 when the Pinochet dictatorship established Chile's integrated income tax system, to keep track of how much tax credit (corporate tax paid by the firm) owners are due when they eventually withdraw these profits and pay individual income taxes. Total FUT profits reported at the end of 2012 were equivalent to Chile's GDP. FUT funds imputed to taxpayers in our datasets make up 56–61 percent of the total.

### 2.2. *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 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 employed to impute undeclared income. Appendix 2 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. 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 that would help detect inconsistencies on tax declarations—especially for partnerships and close corporations. Tax agency access to bank information on checking accounts is highly restricted and cannot be used for general auditing operations. 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 cannot be estimated which should be added back to declared taxable profits (e.g., asset depreciation), 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 best to adjust the imputed accrued profits to national accounts, given the 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 surveys (CASEN) to estimate the portion of the national accounts figure that accrues to individuals who did not file tax returns. 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. We thus assume that

non-filers receive negligible capital income (Alvaredo and Saez, 2010), 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 (Cantallupo *et al.*, 2007). We employ three 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. 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 large accrued profits who declared few distributed profits has engaged in substantial evasion (rather than actually reinvesting profits in the firm). This approach alters the distribution of distributed profits to more closely reflect the distribution of imputed accrued profits. The third approach imputes undeclared profits in proportion to the distribution of retained profits accumulated in the FUT ledger. The assumption here is that the larger the taxpayer's FUT account, the fewer distributed profits the taxpayer has truthfully declared. This approach attempts to capture the view shared by many experts that the FUT serves more to facilitate tax evasion than to stimulate productive investment. Of course, none of these approaches 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 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. We also employ an alternative approach that uses the distribution of gross earnings as the basis for the adjustment. This approach has the advantage that accrued net losses also receive a positive adjustment, which is desirable because our estimates of accrued profits do not correct for tax benefits associated with depreciation; depreciation may account for some of the large net negative values in our datasets.

### 2.3. *Income Definitions for Analyzing Top Shares*

We analyze top income shares using several different income definitions. We begin with a definition based on taxable income that corresponds to earnings realized during the year. This income, denoted  $Y_{Rzd}$ , includes pensions, wages, independent work, taxable interest, and distributed profits.

We next construct an income  $Y_{\text{AcrdProf}}$  that substitutes imputed accrued profits for distributed profits. The logic is to more closely approximate a Haig–Simons income concept—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 characterizing material resources at the top when realized capital income is small compared to unrealized capital income (Smeeding and Thompson, 2010). Our  $Y_{\text{AcrdProf}}$  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, p. 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 various 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  $Y_{\text{AcrdProf}}$  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  $Y_{\text{Rlzd}}$ .

#### Core Income Definitions

$Y_{\text{Rlzd}}$  = pensions + wages + independent work + taxable net interest  
+ taxable rent + distributed profits; declared incomes only

$Y_{\text{Rlzd\_NatAcc}}$  =  $Y_{\text{Rlzd}}$  but adjusting independent work and  
distributed profits to National Accounts

$Y_{\text{AcrdProf}}$  = pensions + wages + independent work + taxable net interest  
+ taxable rent + imputed accrued profits; declared incomes and  
accrued profits for which ownership information exists only

$Y_{\text{AcrdProf\_NatAcc}}$  =  $Y_{\text{AcrdProf}}$  but adjusting independent work and  
accrued profits to National Accounts

#### Auxiliary Definitions

$Y_{\text{Rlzd\_CG}}$  =  $Y_{\text{Rlzd}}$  + capital gains received by individuals

$Y_{\text{Rlzd\_NatAcc\_alt1}}$  =  $Y_{\text{Rlzd\_NatAcc}}$  but using the alternative  
distributed-profits adjustment method based on the  
difference between taxpayers’ positive accrued profits  
and distributed profits



$Y\_Rlzd\_NatAcc\_alt2 = Y\_Rlzd\_NatAcc$  but using the distribution of accumulated retained profits in the FUT to adjust dividends

$Y'\_AcrdProf = Y\_AcrdProf$  + declared accrued profits in firms without ownership information imputed in proportion to declared distributed profits

$Y''\_AcrdProf = Y\_AcrdProf$  + declared accrued profits in firms without ownership information imputed in proportion to the distribution of accrued profits for which ownership information exists

$Y\_AcrdProf\_CG = Y\_AcrdProf$  including capital gains

$Y\_AcrdProf\_Pens = Y\_AcrdProf$  with imputed accrued profits from pension funds instead of pension payments

$Y\_AcrdProf\_NatAcc\_alt = Y\_AcrdProf\_NatAcc$  but using the distribution of gross income to adjust accrued profits

#### 2.4. *Ranking Taxpayers*

Our work with the tax agency microdata produced six datasets based on rankings of individual taxpayers that correspond to each of the four core income definitions listed above, as well as two alternative adjustment procedures ( $Y\_Rlzd\_NatAcc\_alt2$ ,  $Y\_AcrdProf\_NatAcc\_alt$ ). After ranking individuals according to each income definition, the data were aggregated into groups consisting of 11 taxpayers each (rows in our datasets), following the tax agency's protocol for protecting taxpayer confidentiality. When analyzing the additional auxiliary income definitions listed above, we employ the dataset with the ranking that is most closely correlated with the definition in question.

#### 2.5. *Control Incomes*

We estimate control incomes (the denominator for calculating income shares) by combining tax agency data with national accounts, as is standard in the top incomes literature when sizable 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  $Y\_Rlzd\_NatAcc$  (adjusted distributed profits and other realized income) of approximately 60 percent GDP, the same value used for Argentina (Alvaredo, 2010). This value is also similar to control incomes for other countries analyzed in the Atkinson and Piketty (2009, 2010) top incomes volumes. When we

replace distributed profits with imputed accrued profits ( $Y_{\text{AcrdProf\_NatAcc}}$ ), our control income increases to 66–67 percent GDP.

For the income definitions including unadjusted declared profits ( $Y_{\text{Rlzd}}$ ,  $Y_{\text{AcrdProf}}$ ,  $Y'_{\text{AcrdProf}}$ ,  $Y''_{\text{AcrdProf}}$ ), we use the total value of declared profits from the tax agency datasets in the control income instead of the national accounts figures, in accord with our assumption that capital income accrues only to tax filers. 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) (Table A1).

## 2.6. 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 treatments. For the control population (Table A2), we therefore use estimates of the adult population over age 20, following the usual approach in the top incomes literature.

It should be noted that using households as the unit of analysis would result in lower top income shares, considering that female labor participation is relatively low in Chile. Sanhueza and Mayer (2011) illustrate this phenomenon for the top decile and top centile using household survey data; however, they find that differences between shares constructed using household income, per capita household income, and individual income are small. Analyzing gender inequality with tax return data is an interesting potential avenue for future research if the tax agency is able to supply such information.

## 3. RESULTS: TOP INCOMES

### 3.1. Realized Income Shares

We begin our analysis with the standard realized income definition ( $Y_{\text{Rlzd}}$ , Table 1). Top shares are significantly smaller when distributed profits are not adjusted to national accounts compared to scenarios that do adjust profits for under-reporting. For the top 1 percent, we estimate unadjusted shares of 15–15.5 percent, whereas evasion-adjusted shares range from 21.6 to 26.2 percent. We view the unadjusted shares as lower limits. The adjusted shares are of course educated guesses given that the actual distribution of undeclared profits is unobservable. However, we believe that the upward effect on top income shares is accurate.

Our estimated income shares for the top 10 percent, 1 percent, and 0.1 percent do not vary significantly from 2005 to 2009. Shares at the very top show more variation. For the top 0.0001 percent,  $Y_{\text{Rlzd}}$  (unadjusted) and  $Y_{\text{Rlzd\_NatAcc}}$  (adjusted) shares are about half as large in 2009, a recessionary year, whereas  $Y_{\text{Rlzd\_NatAcc\_alt1(2)}}$  shares are 1.8 (1.3) times larger in 2009.

Figure 1 shows Lorenz curves (cumulative income distributions) for the top 10 percent and top 1 percent in 2005, plotted directly from our datasets. As expected, the data are closely approximated by Pareto distributions; the estimated Pareto shape parameter is 2.37 (2.46) for the top 1 percent of the unadjusted 2005 (2009)  $Y_{\text{Rlzd}}$  curve.

TABLE 1  
REALIZED INCOME SHARES (WITH DISTRIBUTED PROFITS), 2005 (2009)

	Top 0.0001%	Top 0.001%	Top 0.01%	Top 0.1%	Top 1%	Top 10%	Top 20%
Y_Rlzd	0.091 (0.053)	0.335 (0.261)	1.090 (0.988)	4.020 (3.825)	15.54 (15.02)	49.30 (48.93)	63.79 (63.94)
Y_Rlzd_CG	0.091 (0.052)	0.336 (0.299)	1.096 (1.034)	4.054 (3.886)	15.60 (15.10)	49.35 (48.98)	63.83 (63.98)
Y_Rlzd_NatAcc	0.211 (0.106)	0.628 (0.454)	1.817 (1.636)	6.145 (5.911)	21.75 (21.63)	55.41 (55.81)	68.46 (69.21)
Y_Rlzd_NatAcc_alt1	0.974 (1.718)	2.901 (3.663)	6.155 (6.795)	11.97 (12.57)	24.39 (24.88)	55.28 (55.69)	68.24 (68.96)
Y_Rlzd_NatAcc_alt2	0.902 (1.140)	3.051 (3.346)	7.006 (7.379)	13.18 (13.70)	25.86 (26.23)	56.17 (56.63)	68.80 (69.56)

TABLE 2  
INCOME SHARES WITH ACCRUED PROFITS, 2005 (2009)

	Top 0.0001%	Top 0.001%	Top 0.01%	Top 0.1%	Top 1%	Top 10%	Top 20%
Y_AcrdProf	0.8277 (1.353)	2.468 (2.895)	5.298 (5.458)	10.66 (10.60)	23.25 (23.04)	55.15 (55.23)	68.72 (69.35)
Y'_AcrdProf	0.7997 (1.290)	2.387 (2.780)	5.216 (5.337)	10.86 (10.71)	24.34 (23.88)	56.58 (56.48)	69.78 (70.27)
Y''_AcrdProf	1.058 (1.755)	3.152 (3.750)	6.706 (7.005)	13.09 (13.18)	26.50 (26.44)	58.01 (58.30)	71.07 (71.92)
Y_AcrdProf_NatAcc	1.422 (2.425)	4.232 (5.176)	8.960 (9.617)	17.14 (17.72)	32.02 (32.55)	61.92 (62.60)	73.68 (74.71)
Y_AcrdProf_NatAcc_alt	1.583 (NA)	5.390 (NA)	10.91 (NA)	19.26 (NA)	32.96 (NA)	61.52 (NA)	73.12 (NA)
Y_AcrdProf_CG	0.8543 (1.377)	2.497 (3.028)	5.372 (5.744)	10.82 (11.01)	23.44 (23.42)	55.27 (55.44)	68.79 (69.48)
Y_AcrdProf_Pen	0.8959 (1.460)	2.671 (3.126)	5.734 (5.894)	11.54 (11.45)	25.03 (24.75)	57.32 (57.59)	70.13 (71.10)

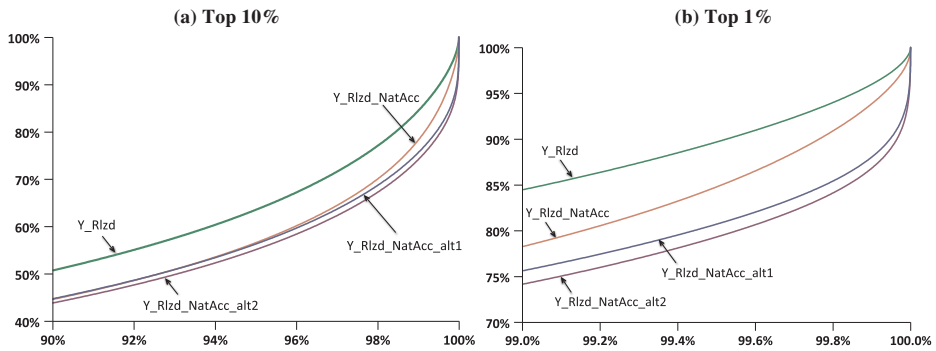


Figure 1. Lorenz Curves, 2005 Realized Income

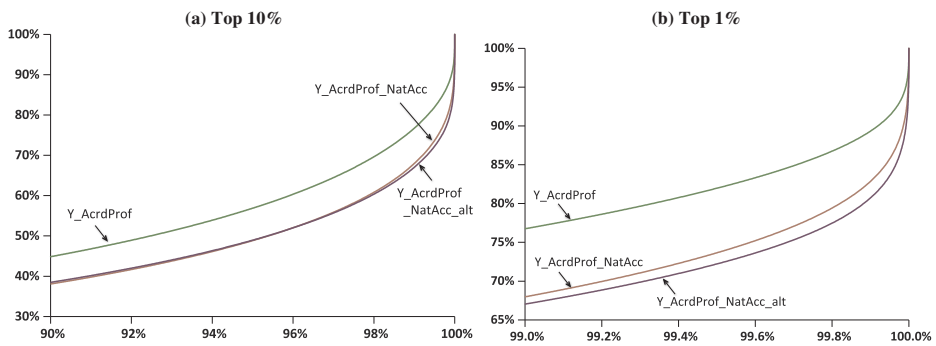


Figure 2. Lorenz Curves, 2005 Income with Accrued Profits

### 3.2. Shares with Imputed Accrued Profits

Top income shares including accrued profits instead of distributed profits ( $Y_{AcrdProf}$ , Table 2, Figure 2) are significantly larger, indicating the very high concentration of capital ownership in Chile. Estimates for the top 1 percent share start from a minimum of 23 percent when no adjustments are made to the tax agency data ( $Y_{AcrdProf}$ ). These findings agree with other studies that report more significant inequality when working with income concepts that include broader sources of realized and/or unrealized capital income (Atkinson and Piketty, 2010; Smeeding and Thompson, 2010; Roine and Waldenström, 2012).

To further assess the importance of accrued profits at the top, following Roine and Waldenström’s (2012) approach for capital gains, we calculate shares with accrued profits using two different rankings: one including only distributed profits, and one including accrued profits instead. We then compare these to shares including distributed profits only (Table A3).

The results indicate that retained profits are an important resource for those who are already at the top of the realized income distribution ( $Y_{Rlzd}$ ), and including accrued profits in the income concept significantly augments inequality. Shares increase substantially when accrued profits are substituted for distributed profits

without altering the original ranking of taxpayers. Shares with accrued profits increase further when taxpayers are re-ranked according to this income concept. Ratios of shares with accrued profits to those with distributed profits, ranking taxpayers according to the respective income definitions, range from 1.47 to 1.53. These ratios are similar to ratios of top 1 percent shares with capital gains to those without in Sweden (Roine and Waldenström, 2012).

These results also indicate that rankings corresponding to the two different income concepts differ non-trivially. Indeed, there are taxpayers in our datasets who declare relatively low distributed profits even though their accrued profits are quite large, and taxpayers who receive substantial distributed profits even though their net accrued profits for the year are 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 overwhelmed 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.

Another way to assess the differences in these two rankings entails identifying the percent of taxpayers in a given top  $Y_{Rlzd}$  fractile who also fall within the same fractile of the  $Y_{AcrdProf}$  distribution (Table A4). Continuity across the top 1 percent is quite high—nearly 78 percent—whereas much smaller percentages of taxpayers in the top 0.01 percent and top 0.001 percent were also at the top of the  $Y_{AcrdProf}$  distribution.

### 3.3. *Estimated Top Shares from Published Tabulated Data (2004–12)*

We hope to build a more extended time series from tax-return microdata in the future. In the meantime, we provide rough estimates of top income shares from published tabulated data (reported income with distributed profits, available only for the years 2004–12) by applying fixed adjustments based on comparisons with our much more accurate 2005 and 2009 estimates (Table A5). We first estimate shares directly from the tabulated data for 2005 and 2009, substituting the total amount of reported income from the tabulated data for the total reported income in our more detailed datasets. Total income in the tabulated data is less than the total income in our datasets, partly due to accounting differences in the way the tax agency reports the data. We apply standard Pareto interpolation procedures used in the top income literature to estimate income shares for the top 1 percent, 0.1 percent, and 0.01 percent from the tabulated data. These shares agree well with our  $Y_{Rlzd}$  shares for 2005 and 2009 (1–5 percent relative difference). We then calculate adjustment factors in order to estimate shares of different income concepts from the tabulated data (Table A6). Adjustment factors for  $Y_{Rlzd\_NatAcc}$  top shares are quite stable for each of the three top fractiles across the two years for which we have tax-return microdata (1–3 percent relative difference). Adjustment factors for  $Y_{AcrdProf}$  and  $Y_{AcrdProf\_NatAcc}$  are also reasonably stable for the top 0.1 percent and 1 percent (2–5 percent and 6–10 percent relative difference, respectively). We

proceed to multiply top fractile shares estimated from the tabulated data for the other years by the geometric mean of our 2005 and 2009 adjustment factors.

For the  $Y_{\text{AcrdProf\_NatAcc}}$  top 0.01 percent, we report shares with two significant figures only. Given the more substantial relative variation between the 2005 and 2009 adjustment factors, applying a constant adjustment factor across the full time series likely produces more error, so these shares should be treated as rougher approximations.

Top income shares are fairly constant from 2004 to 2011, except for anomalously high 2008 values. The published tax agency data for this year reports an unusually high mean income for taxpayers in the top bracket; access to microdata will be necessary for analyzing why this year appears out of line with the others.

### 3.4. *International Comparisons*

Figure 3 places Chile's standard top income shares ( $Y_{\text{Rlzd}}$ ) in cross-national context. We plot the Chilean estimates from tabulated data along with our microdata estimates, with and without adjusting for under-declaration. When examining Figure 3, it is important to recognize that income definitions 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. At present, these difficulties remain unresolved in the top incomes literature. Bearing these caveats in mind, we discuss some tentative comparative conclusions.

When profits are not adjusted to national accounts, Chile's top 1 percent shares are higher than most European countries but lower than the four inequality leaders in the World Top Incomes Database (Colombia, Argentina, the U.S., South Africa) (Figure 3a). However, we think it is more appropriate to use Chile's adjusted shares in cross-national comparisons. Although adjusting to national accounts is not standard in the top incomes literature, Chile's tax system creates strong incentives to under-declare distributed profits, and Chile's tax agency has weak capacity for detecting undeclared distributed profits. 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, taxpayers have incentives to over-declare capital income in order to justify changes in patrimony that might otherwise alert officials to investigate for evasion or money laundering (AFIP, 2008). While Nordic countries have similar gaps between tax rates on personal (wage) income and capital income, avoidance (income shifting) may be more salient than evasion (undeclared income). Roine and Waldenström (2008, p. 375) estimate that correcting for evasion in Sweden causes top 1 percent shares to rise by at most 25 percent. For Chile, top 1 percent shares increase by 40–44 percent in the most conservative adjustment scenario ( $Y_{\text{Rlzd\_NatAcc}}$ ); higher fractiles increase by far more.

When profits are adjusted to national accounts, Chile's top 1 percent share surpasses all other countries in the World Top Incomes Database. Evasion-adjusted top 1 percent shares for Argentina (Alvaredo, 2007) reach similarly high

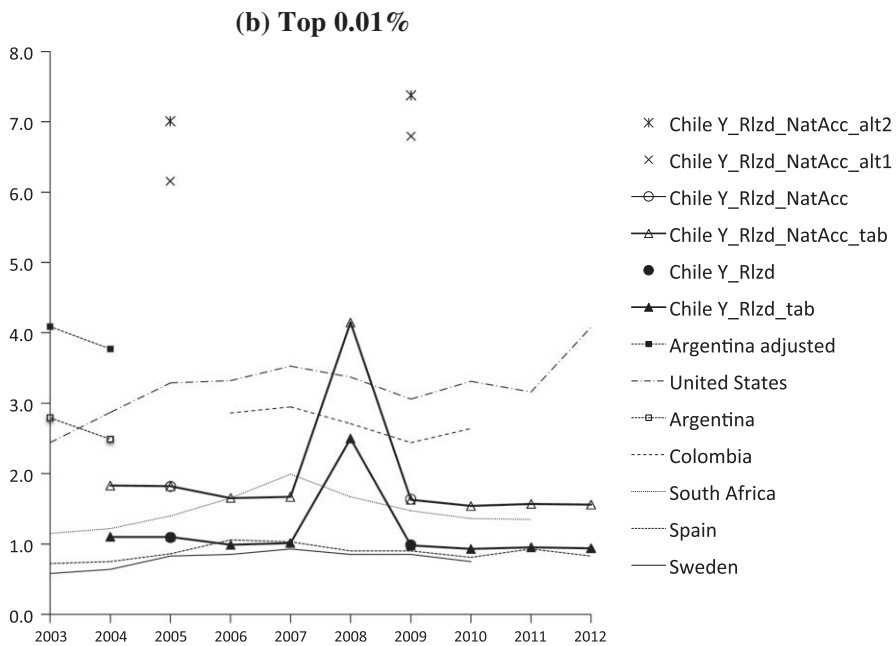
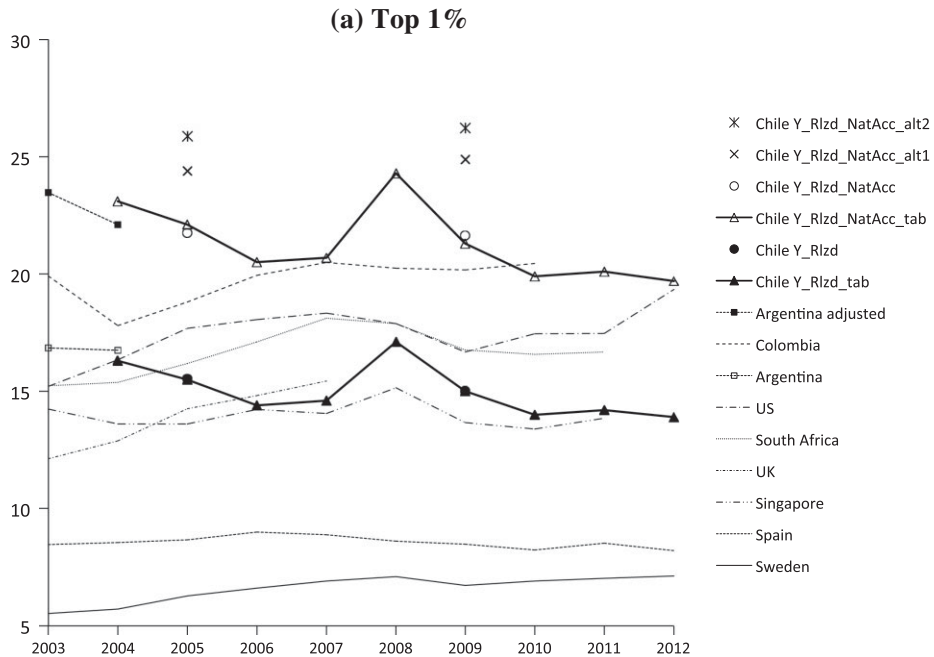


Figure 3. Standard Realized Income Shares (%), Excluding Capital Gains

*Notes:* The standard realized income definition includes only distributed profits. For the Chilean estimates, the 2008 values for estimates from tabulated data are outliers that likely reflect an error in the published data.

*Source:* Authors' calculations from own datasets and published tabulated data (Chile); World Top Incomes Database (<http://topincomes.g-mond.parisschoolofeconomics.eu/#Database>); Alvaredo (2007) (evasion-adjusted Argentine shares).

levels.<sup>3</sup> Shares with adjusted profits for Chile's top 0.1 percent and higher fractiles are sensitive to the method used for imputing undeclared dividends. Adjusted top 0.01 percent  $Y_{Rlzd\_NatAcc\_alt1(2)}$  shares exceed those in all other countries analyzed (Figure 3b). Chile's adjusted  $Y_{Rlzd\_NatAcc}$  shares are substantially lower but similar to South Africa. Unadjusted Chilean shares are closer to European shares.

Turning to our more complete income definition ( $Y_{AcrdProf}$ ), cross-national comparisons become more difficult since the distribution of accrued profits has rarely been analyzed. We tentatively compare Chilean income shares with accrued profits to income shares including capital gains in other countries (Figure 4), assuming for these other countries as Piketty and Saez (2006, p. 9) do for the U.S. 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 percent shares with accrued profits exceed U.S. shares with capital gains. Chile's unadjusted top 0.01 percent shares are similar to U.S. shares, whereas adjusted top 0.01 percent shares are significantly higher.

### 3.5. *Mobility at the Top*

Our data suggest that mobility in Chile among top income fractiles (Table A7) is similar to developed countries. After four years, 60 percent of taxpayers who were in the top 1 percent in 2005 remained within that fractile (64 percent if taxpayers who no longer existed in 2009 are eliminated from the initial group). For the U.S. and Germany, studies have found that the probability of remaining in the top 1 percent after 3–5 years is 60–68 percent (Kopczuk *et al.*, 2010; Jenderny, forthcoming). For the top 0.1 percent in Chile, we find that 43 percent remained in that fractile four years later; similarly, the probability of remaining in the top 0.1 percent in Canada is 40–50 percent (Saez and Veall, 2007).

Mobility among fractiles based on accrued profits (Table A8) is slightly lower for all but the top 0.001 percent of Chileans. Forty percent of taxpayers remained in the top 0.001 percent  $Y_{AcrdProf}$  fractile after four years, compared to 32 percent for the  $Y_{Rlzd}$  fractile.

### 3.6. *Heavy Concentration of Accumulated Retained Profits*

Our datasets allow us to examine not only the distribution of profits accrued during the year in question, but also the distribution of retained profits accumulated in the FUT since 1984. These retained profits represent a significant source of wealth in Chile—at least on paper (the FUT is an accounting mechanism, and many of these profits in practice have probably been withdrawn)—and they are heavily concentrated (Table A9). Depending on the income definition used to rank taxpayers and the year, the top 0.1 percent owns 36–78 percent of retained profits. As such, accumulated retained profits are significantly more concentrated than yearly (declared) distributed and accrued profits. (The top 0.1 percent receives 17–66 percent of accrued profits and 12–23 percent of distributed profits.)

<sup>3</sup>Alvaredo's methodology for adjusting incomes differs from ours; he views his estimates as upper limits that likely overestimate evasion among the very rich.



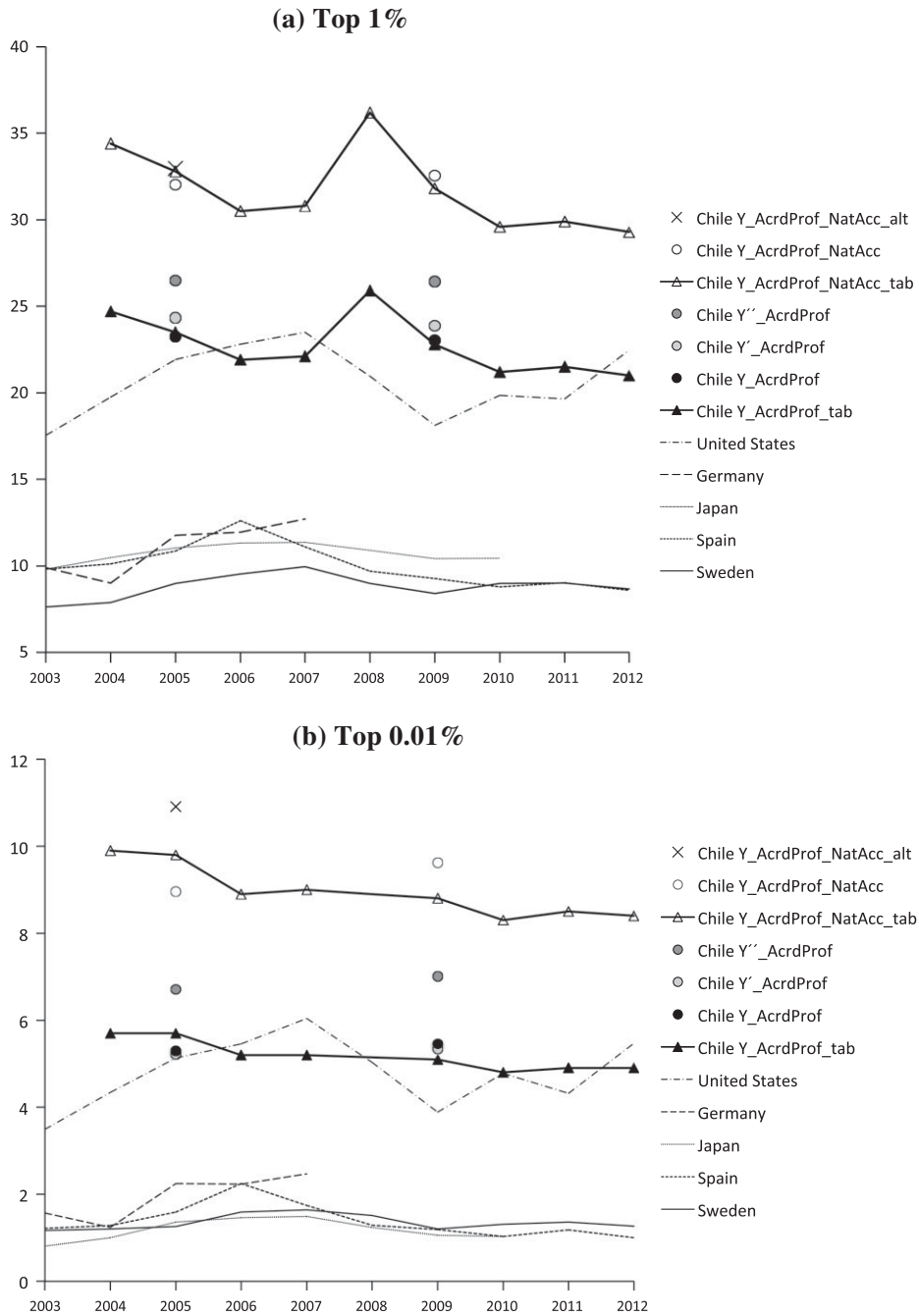


Figure 4. Income Shares (%), Including Accrued Profits (Chile) or Capital Gains

*Note:* The 2008 values for estimates from the tabulated Chilean data are outliers that likely reflect an error in the published data; they are not displayed in the Top 0.01 percent chart because the derivation procedure amplifies their extremity (see Tables A5 and A6).

*Source:* Authors' calculations from own datasets and published tabulated data (Chile); World Top Incomes Database (<http://topincomes.g-mond.parisschoolofeconomics.eu/#Database>).

Additionally, our data show that FUT wealth is only loosely correlated with reported income  $Y_{Rlzd}$ . The correlation with reported  $Y_{AcrdProf}$  income is much stronger.

### 3.7. *Income Composition: Importance of Profits at the Very Top*

We focus our analysis of top income compositions on income definitions  $Y_{Rlzd}$  and  $Y_{AcrdProf}$ , without any adjustments for under-reported profits or independent work. Figure 5 shows the share of each income type for the top percentiles. For  $Y_{Rlzd}$ , distributed profits dominate other income sources only for the top 0.001 percent; wages dominate for lower percentiles within the top 1 percent. The  $Y_{Rlzd}$  figure also displays the ratio of declared distributed profits to accrued profits. These ratios vary widely, from a minimum of 12 percent to a maximum of 75 percent, with no consistent pattern over time or across percentiles. For  $Y_{AcrdProf}$ , accrued profits dominate within the top 0.1 percent, constituting over 84 percent of total income in that fractile; less than 13 percent of accrued profits are distributed. Compared to  $Y_{AcrdProf}$ ,  $Y_{Rlzd}$  income compositions are much more variable over time, even though shares of each source in aggregate personal income change only marginally. Declared distributed profits make up a much lower share of the two top percentile incomes in 2009 (44 and 32 percent, respectively) compared to 2005 (87 and 46 percent, respectively). For comparison, the figures also display capital gains as a percent of total income, even though they are not included in the income definition. For the most part, capital gains are negligible compared to other income sources.

To get a sense of how individuals in the top 1 percent can be characterized in terms of their income sources, we rank our rows of 11 aggregated taxpayers by their share of specific income types: wages and pensions, independent work, and profits (income shares from interest and rent are small). This procedure follows Bach *et al.* (2012), except that we are not able to rank at the individual level. However, each row for this purpose can be considered a “typical” taxpayer in the corresponding cohort. Most of those in the top 1 percent receive income from a mix of sources (Table A10). For  $Y_{Rlzd}$ , approximately 9 percent (16 percent) receive over 80 percent of their income from wages in 2005 (2009); 0 percent report distributed profits in excess of 80 percent of total income. Independent work plays a much less significant role compared to wages and profits; 98 percent (99 percent) of typical taxpayers receive under 30 percent of their income from this source. For  $Y_{AcrdProf}$ , the fraction of wage-earners (over 80 percent of income from wages and pensions) in the top 1 percent drops to 5 percent (10 percent), while the fraction of business people (over 80 percent from accrued profits) increases to 3 percent.

When we examine the top 0.01 percent alone, business activity grows in importance relative to wage income for 2006. One percent of these typical taxpayers report distributed profits surpassing 80 percent of total  $Y_{Rlzd}$  income compared to just 3 percent in the wage-earners category. The figures are more dramatic for  $Y_{AcrdProf}$  incomes. Accrued profits exceed 80 percent of total income for 66 percent (61 percent) of typical taxpayers in 2005 (2009), whereas none have wage-income shares over 30 percent. Accordingly, when we focus on accrued profits rather than distributed profits, the top of the distribution is clearly and consistently dominated by business owners.

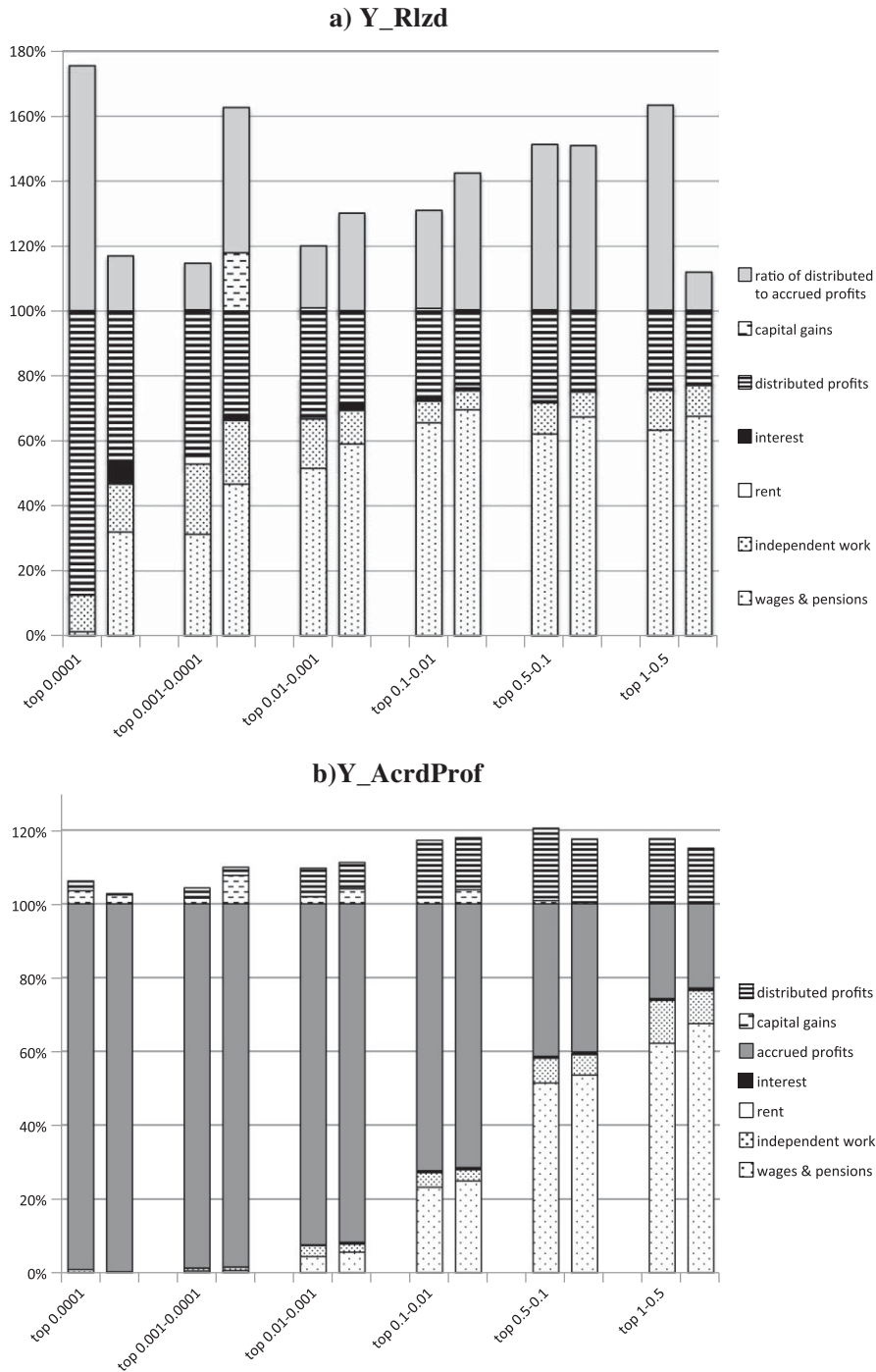


Figure 5. Top Income Compositions, % Total; 2005: Left Bar, 2009: Right Bar

The same phenomenon is apparent within the top 0.001 percent as well; the top of the  $Y_{\text{Rlzd}}$  distribution is dominated by wage earners, whereas the top of the  $Y_{\text{AcrdProf}}$  distribution is dominated by business owners. All typical taxpayers in the  $Y_{\text{AcrdProf}}$  top 0.001 percent have accrued profits exceeding 98 percent of total income. In stark contrast, all typical taxpayers in the  $Y_{\text{Rlzd}}$  top 0.001 percent have wage income shares above 96 percent. These results further indicate the importance of analyzing accrued profits.

#### 4. EFFECTIVE TAX RATES

##### 4.1. Tax Data

Our datasets contain information on both individual and corporate income taxes. Chile's individual income tax is divided into two categories. People who earn only wage income pay the "second category tax" (ISC, *impuesto de segunda categoría*), with progressive marginal rates rising from 5 to 40 percent as of 2010 (Table A11). People who receive any other sources of income instead of or in addition to wages pay the "complementary global tax" (IGC, *impuesto global complementario*), which applies the same progressive rate schedule to the sum total of taxable income (excepting capital gains). The corporate income tax on accrued profits (IPC, *impuesto de primera categoría*) was imputed to individuals using the same iterative assignment procedure employed to allocate accrued profits (Section 2.1). We imputed the small amount of corporate tax corresponding to accrued profits in pension funds (approximately 5 percent of the total) in proportion to taxpayers' work and pension income,<sup>4</sup> a similar procedure to that employed by Piketty and Saez (2006) for the U.S.

Amounts registered for the corporate tax and the IGC 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 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.

##### 4.2. Effective Rates Ignoring Corporate Tax

Table 3 displays effective tax rates defined as individual income taxes paid divided by declared realized income ( $Y_{\text{Rlzd}}$ ). We exclude corporate taxes on retained profits, as is most common in incidence studies. However, we do include corporate taxes corresponding to distributed profits—recall that Chile's corporate tax is credited against individual income taxes owed when profits are distributed. Effective tax rates calculated including capital gains and capital gains taxes differ only marginally from the rates in Table 3, except for the top 0.001 percent in 2009 (the effective rate drops by 1.7 percentage points when capital gains are included).

<sup>4</sup>We estimated corporate tax from pension funds by applying an effective rate (16.8 percent) calculated from aggregate figures to accrued profits in these funds. We do not take independent work into account when imputing corporate tax from pension funds since the bulk of pension contributions were made by dependent workers.

TABLE 3  
AVERAGE EFFECTIVE TAX RATES (%), EXCLUDING CORPORATE TAX ON RETAINED PROFITS

(a) Rates with No Adjustments for Undeclared Income					
	Chile <sup>a</sup>		Uruguay <sup>b</sup>	U.S. <sup>c</sup>	Germany <sup>d</sup>
	2005	2009	2009	2004	2005
Top 0.0001%	15.43	30.95	NA	NA	28.7
Top 0.001%	27.21	30.14	NA	NA	31.0
Top 0.01%	29.14	28.28	NA	25.6	32.9
Top 0.1%	25.31	25.12	14.4	24.8	33.7
Top 1%	15.41	16.40	15.9	20.8	30.5
P 99.99–100%	29.14	28.28	NA	26.2	NA
P 99.9–99.99%	23.89	24.03	NA	25.1	NA
P 99.5–99.9%	14.62	16.05	NA	23.8	NA
P 99–99.5%	8.73	10.30	NA	21.4	NA

*Source and Notes:* <sup>a</sup>Authors' calculations from own datasets using income denominator Y\_Rlzd (includes only distributed profits); <sup>b</sup>Burdin *et al.* (2014); <sup>c</sup>Piketty and Saez (2006); individual income tax only, taxpayers ranked excluding capital gains; <sup>d</sup>Bach *et al.* (2012).

(b) Rates Adjusted for Undeclared Income

	Chile <sup>a</sup> Income denominator						Colombia <sup>b</sup>	
	Y_Rlzd_NatAcc		Y_Rlzd_NatAcc_alt1		Y_Rlzd_NatAcc_alt2		2006	2009
	2005	2009	2005	2009	2005	2009		
Top 0.0001%	15.35	14.93	15.92	8.34	8.89	8.71	NA	NA
Top 0.001%	19.37	15.71	15.85	8.59	8.49	8.69	7.3	4.8
Top 0.01%	20.24	15.38	16.27	9.23	10.16	9.13	8.3	7.1
Top 0.1%	19.07	14.47	17.27	11.03	11.73	10.69	8.7	7.7
Top 1%	15.35	12.15	15.47	12.04	12.10	11.85	7.5	7.1
P 99.99–100%	20.24	15.38	16.27	9.23	10.16	9.13	8.3	7.1
P 99.9–99.99%	18.59	14.11	18.31	13.15	13.79	12.52	NA	NA
P 99.5–99.9%	15.08	11.72	16.08	14.63	14.07	14.72	7.7	7.6
P 99–99.5%	12.23	10.69	10.27	10.81	10.21	10.80	5.6	5.7

*Source and Notes:* <sup>a</sup>Authors' calculations from own datasets. Numerator includes imputed corporate tax on undeclared dividends, approximated by applying the global average withholding rate for the year. This approach likely overestimates the amount of tax actually paid.

<sup>b</sup>Alvaredo and Londoño Vélez (2013). Numerator includes individual income tax and estimated corporate tax on dividends. The adjustment method employed for the income denominator differs from ours. Comparison with the Chilean rates therefore requires caution.

Rates do not vary much from 2005 to 2009, with the exception of the top 0.0001 percent, which paid only 15 percent in 2005 compared to 31 percent in 2009. The 2005 rate results from the unusually low tax on distributed profits collected from the owners' businesses (corporate tax credit). This may reflect an error in the data provided by the tax agency; it is possible that a tax return for a non-Chilean national was accidentally included in the top group of 11 taxpayers.

Effective tax rates vary substantially within the percentiles reported in Table 3. Over an interval of 0.01 percent around the top 99.9 percent, the coefficient of variation is 12 percent. Tax benefits to promote savings are one salient source of horizontal inequity that may help to explain the spread.

Table 3 includes effective individual income tax rates for the U.S., Germany, Uruguay, and Colombia, the only countries to our knowledge for which similar

TABLE 4  
EFFECTIVE TAX RATES (%), INCLUDING CORPORATE TAX ON  
RETAINED PROFITS

	Chile		U.S.
	2005	2009	2004
Top 0.0001%	15.66	13.92	NA
Top 0.001%	15.22	14.17	NA
Top 0.01%	15.96	15.13	31.2
Top 0.1%	17.20	16.54	29.2
Top 1%	15.15	15.47	24.3
P 99.99–100%	15.96	15.13	30.8
P 99.9–99.99%	18.43	18.03	30.0
P 99.5–99.9%	15.90	16.73	28.1
P 99–99.5%	9.91	11.53	25.1

*Note:* Chilean rates calculated with income denominator  $Y_{AcrdProf}$  (reported incomes with accrued profits).

*Source:* Authors' calculations from own datasets; Piketty and Saez (2006) for the U.S.

analyses exist. However, much caution is required when making cross-country comparisons. Given the problem of undeclared dividends, the Chilean rates are upper bounds; concluding that rates at the top are similar in Chile and the two OECD countries would be misguided (Table 3a). Chilean rates at the top are lower and flatter when distributed profits are adjusted to national accounts. When comparing adjusted rates for Chile and Colombia (Table 3b), it is important to note that the methods used to adjust the income denominator differ for the two countries. Moreover, the strikingly low Colombian rates are sensitive to Alvaredo and Londoño Vélez's (2013, p. 22) assumption that 33 percent of income reported as "*ingresos no constitutivos de renta*" are dividends taxed at the firm level. They estimate that if dividends instead comprise 75 percent of income in this category, the average effective tax rate for the top 0.01 percent would rise to 14 percent. That rate is closer to Chilean rates including imputed corporate taxes and accrued profits in the analysis (below).

#### 4.3. *Low Effective Rates Including Imputed Corporate Tax and Accrued Profits*

Given the problem of undeclared distributed profits, we believe effective rates that include the corporate tax and accrued profits provide a better metric of the tax burden at the top in Chile. Table 4 displays average effective tax rates defined as all income taxes paid during the year divided by income accrued during the year ( $Y_{AcrdProf}$ ). Average effective rates for the top fractiles reach at most 17.2 percent.

The average tax rates reported for the top percentiles again mask significant variation of rates within these groups. This variation is due largely to the fact that total income tax liabilities for the year do not correspond directly to income definition  $Y_{AcrdProf}$  (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  $Y_{AcrdProf}$ . In addition to the distinct tax treatment of retained versus distributed profits, loss carry forward or carry back and use of other tax benefits contributes to horizontal inequities.

For comparative context, Table 4 also displays average effective tax rates for the U.S. calculated by Piketty and Saez (2006), the only study of which we are aware that fully includes the corporate tax in analyzing top fractile tax incidence. The Chilean rates are 40–64 percent of the U.S. rates. When comparing the Chilean and U.S. effective tax rates, 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’ realized 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. It should also be noted that Piketty and Saez (2006) do not impute reinvested corporate profits in their analysis, since they maintain that realized capital gains on stocks in the U.S. are of comparable magnitude. The Chilean context is very different, given that few companies are publicly traded, only 35 percent of profits are distributed annually according to tax return data, and total reported capital gains are less than 1 percent of accrued profits. 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.

## 5. CONCLUSION

Our highly detailed and disaggregated tax-return data provide the most accurate available estimates to date of top income shares, income compositions, unrealized capital income, and effective tax rates in Chile. Chilean top income shares—whether profits are adjusted to national accounts or not—are among the highest of those countries that have so far been analyzed with similar methods. Including accrued profits in the analysis skews the distribution even more heavily toward the top. Effective tax rates, meanwhile, are modest. Regarding policy implications, the evidence we present suggests that there is substantial room to raise revenue for social spending by taxing Chile’s upper income earners and capital owners more heavily, in line with the Bachelet administration’s 2014 tax reform, although analysis of optimal tax policy and its role in public finance lies beyond the scope of this paper.<sup>5</sup> We hope that our empirical data will inform ongoing debates on tax policy and inequality in Chile.

We hope to extend our research during the coming years by building a time series, which would allow analysis of the determinants of top income shares and responses to tax policy changes since democratization. Such analysis could potentially yield different results from OECD findings (Roine *et al.*, 2009; Piketty *et al.*, 2014), given that Latin America is characterized by a distinct type of “hierarchical capitalism” that reinforces economic and political inequalities (Schneider and Soskice, 2009; Schneider, 2013). Access to more years of data, which the Chilean

<sup>5</sup>Recent research suggests capital income could be taxed more heavily without substantial efficiency costs (Christiansen and Tuomala, 2008; Diamond and Saez, 2011; Saez, 2013; Yagan, 2014).

tax agency will hopefully provide as time and resources allow, will also afford more complete information on business ownership for imputing accrued profits.

More broadly, our analysis highlights the need for greater attention in the top incomes literature to three research agendas. First, more efforts to analyze the distribution of capital income—whether realized 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, realized capital income may correlate only roughly with unrealized capital income at the top of the distribution. Second, more analysis of how tax systems affect income definitions as well as how much and what type of income is actually declared across countries (and over time) is in order. In Chile, the structure of the income tax creates a particular set of incentives that must be taken into account when endeavoring to estimate income shares and effective tax rates that are reasonably comparable with other countries. Additional attention to comparability issues, cross-national systemization, and methodological standards for imputing undeclared income will become increasingly important as tax return data become available 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 undertake such analysis. This line of inquiry could help shed light on the relationship between taxation and inequality at the top of the income distribution and could serve as a valuable input for policy debates on tax reform and analysis of redistributive politics.

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## SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

- Appendix 1:** Income Categories
- Appendix 2:** Adjusting for Undeclared Income
- Appendix 3:** Additional Tables