TOP INCOMES IN CHILE: A HISTORICAL PERSPECTIVE ON INCOME INEQUALITY, 1964–2017

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We present a novel series of Chilean top-income shares covering half a century, mainly based on income-tax declarations and the National Accounts. Such a time frame of analysis is still rare in the literature of developing countries. We distinguish between a fiscal-income series (1964–2017) and an *adjusted* series (1990–2017). The former covers individual income, while the latter also includes corporate undistributed profits, which affects both levels and trends. The fiscal-income estimates start with low levels and a decreasing trend over the 1960s. They then increase rapidly during the dictatorship years (1973–89). The series ends with a high, yet slowly decreasing, concentration for most of the recent democratic period (1990–2017). By contrast, the adjusted series has followed a U-shape since the return of democracy, contradicting the established consensus on falling inequality over the period. Furthermore, Chile ranks among the most unequal countries in both the OECD and Latin American countries over the period.

1. Introduction

Following seminal contributions by Piketty (2001) and Piketty and Saez (2003), extensive progress has been made over the past two decades in the field of economic inequality. Studies on more than 40 countries have used tax data to explore income concentration within the richest fractiles of the population.[1] These works have revealed sections of the distribution that were previously invisible to the eyes of researchers, thus allowing the examination of a larger part of it and extending farther back in time than any survey statistic. Indeed, the true value of tax statistics is to focus on small groups of people in whom substantial parts of total income are concentrated, the evolution of which is likely to influence overall inequality trends (Alvaredo *et al*., 2013).

However, to date there is still scant evidence on the long-term evolution of top-income shares in the developing world. This paper contributes to filling this gap by making use of a series of Chilean tax statistics that extends over more than 50 years. Chile is an interesting case for various reasons. Although ranked among the most unequal OECD countries (OECD, 2015), Chile has been considered one of the stronger states in Latin America in terms of state capacity, corruption levels, and the effectiveness of tax policy. Yet the country still has a relatively low level of redistribution, and fiscal policy has a limited capacity to reduce extremely high market inequalities (OECD, 2015).

This is certainly not the first time that income-tax declarations have served as a base for the study of Chilean inequality. Previous works by López *et al*. (2013) and Fairfield and Jorratt De Luis (2016) provide solid estimates on top-income shares in the country, yet only for a few recent years.[2] In this paper, we use these studies—especially Fairfield and Jorratt De Luis (2016), due to the data quality—as valuable references to adjust and compare the level of our own estimates, which are mostly focused on describing long-run trends. Furthermore, both studies have also highlighted the local relevance of studying undistributed profits, which likely have a biasing impact on inequality estimates via incentives to retain profits inside corporations. Hence, in this study, we distinguish between our fiscal-income series, which strictly covers individual income for the period from 1964 to 2017, and the *adjusted* series, which includes the imputation of undistributed profits for a shorter period from 1990 to 2017.

Our findings indicate that income concentration remains high in both series throughout the whole period under study. In a broad perspective, the fiscal-income series starts with relatively low levels—with top 1 percent income shares close to 13 percent on average—and a decreasing concentration during the 1960s and the beginning of the 1970s. The trend is sharply interrupted in 1974, when rapidly increasing concentration begins and holds at least for the first half of Pinochet's dictatorship, reaching a top 1 percent close to 17 percent in 1981. Due to missing information, the series is interrupted for the rest of the regime. The return to democracy takes place in a context of even higher inequality, with a top 1 percent

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[1]See the World Inequality Database at http://www.WID.world.
[2]López *et al*. (2013) covers the period from 2004 to 2010, López et al. (2016) the period from 2004 to 2013, and Fairfield and Jorratt De Luis (2016) only have data for 2005 and 2009.

close to 18 percent of fiscal income. Estimates from this series then describe a slowly decreasing tendency over the following two decades, reaching levels close to 14.4 percent in 2013. What appears to be a trend reversal takes place during the remaining 4 years, attaining a top 1 percent share close to 16.2 percent at the end of the period. Once we impute the value of undistributed profits that is reported in the National Accounts, levels of income concentration increase considerably—that is, 4–9 percentage points higher for the top 1 percent. The adjusted series describes a trend that is closer to a U-shape during the democratic period. The series reaches values slightly higher than 21 percent at both ends of the period and has a bottom value close to 18 percent in 2003. Estimates from both of our series seem to be consistent with those constructed by Fairfield and Jorratt De Luis (2016) using comparable income definitions with more exhaustive data for 2005 and 2009. Furthermore, we find that Chile ranks among the most unequal in both Latin American and developed countries over the period. In addition, we show that local survey data are badly adapted to study top incomes.

It should be noted that our main data source (i.e. tabulated income-tax declarations) has a major limitation in that it mostly reports total income without information on composition by type (e.g. wages, pensions, interest, dividends). We can only observe a limited decomposition for a few recent years. In addition, income is reported *after* deductions for most years, which is rather impractical since the literature has traditionally studied "fiscal income," which is income *before* deductions. We are thus pushed to make adjustments based on the few years where we could find distributive information on deductions and allowances. This configuration is far from ideal, since it also prevents us from making adjustments for tax evasion by income type, as is done in Fairfield and Jorratt De Luis (2016). This latter limitation likely biases our estimates downward. We therefore consider our results to give a rather conservative indication of income concentration levels and they mainly serve to study the evolution of income concentration in the long run.

This paper is organized as follows. Section 2 presents a review of previous studies on Chilean top-income shares. Section 3 discusses the structure of our data along with methodological issues, such as the interpolation method and the construction of totals for both population and income. Section 4 presents the results. Section 5 compares our estimates to those of other countries and those obtained for Chile using the National Socio-Economic Characterization (CASEN) survey. Section 6 discusses trend robustness. We finish with some concluding remarks.

2. Previous Evidence on Top Incomes in Chile

The first attempt to study Chilean top incomes was made by Sanhueza and Mayer (2011). They used the employment survey of the Universidad de Chile (*Encuesta de Ocupación y Desempleo*; henceforth, "EOD"), which covers a period of more than 50 years. Their data source has the benefit of being relatively homogeneous throughout the period, yet it is only representative of the "greater" Santiago, which is basically the capital city and its surroundings. Although it captures a variety of income types, capital incomes appear to be poorly represented. Throughout their study, the authors include them under the label "other incomes" (Sanhueza

and Mayer, 2011, figs 7 and 8), which only represents a tenth of the richest decile's income and less than 15 percent of the top percentile's total income for most of the period. Moreover, we know from Taleb and Douady (2015) that estimates of small top-income groups are strongly biased downward in small samples. We should thus expect estimates based on the EOD to be significantly underestimated. Sanhueza and Mayer (2011) report top 1 percent income shares that mostly range between 7.5 percent and 12.5 percent. These reach exceptionally high levels—close to 17 percent—during the last years of the dictatorship (1987–8).

Subsequently, López et al. (2013) produced the first estimates based on personal income tax declarations. These were publicly available in tabulated form, for the period from 2004 to 2010, on the Chilean tax agency's website. The authors cleverly combined information from other studies to make adjustments to the original data. To approximate the aggregate income of the near 30 percent of adults that do not fill in tax declarations, they used information from Cea et al. (2009) on the income of informal independent workers. To adjust for tax evasion, they used estimates on average evasion rates produced by Jorratt De Luis (2012), which range between 22 percent and 30 percent during the period. The authors thus apply a flat scaling factor, assuming homogeneous evasion rates, to the income of all individuals who are subject to positive marginal tax rates (around 15 percent of adults, concentrating around 65 percent of declared income). They argue that the assumption of homogeneity should be treated as a conservative one, as evasion rates are likely to be increasing with income. Their first set of estimates, including these adjustments, result in an average top 1 percent share that is close to 21 percent of total income, which is almost double the estimates presented by Sanhueza and Mayer (2011).[3] Furthermore, López et al. (2013) focus their attention on the issue of undistributed profits as being a specific concern for Chile. They argue that there are strong institutional incentives for retaining profits artificially, at least during the 2000s (see Section 3.4). They thus impute the whole value of corporate retained profits, which they obtain from Jorratt De Luis (2012), to individuals. To do so, they base their imputation method in the distribution of national assets that is presented in Solimano and Pollack (2006). Estimates including the imputation of undistributed profits are substantially higher, with an average close to 33 percent of total income being received by the richest percentile of the distribution. In the case they take into account accrued capital gains and their opportunity cost, this figure is closer to 31 percent.[4] In a succeeding paper, López et al. (2016) applied

[3]It should be noted that the evasion rates presented in Jorratt De Luis (2012), which are used by López et al. (2013) to make adjustments, correspond to the "first category tax" (or "IPC" for its acronym in Spanish), which is the tax for capital income of both physical and legal persons (including both distributed and retained profits of firms). In the case of physical persons, the IPC works as a tax credit for personal income tax (e.g. for dividends). However, López et al. (2013) apply adjustments to total income declared, including both labor and capital income. Given that evasion is usually significantly lower in the former than in the latter and that the majority of income declared to the tax agency is remuneration for labor, the average evasion rates used by the authors may be overestimated.

[4]The top-incomes literature often includes realized capital gains to the income definition to address the issue of undistributed profits (Atkinson et al., 2011). Given that Chilean tax-legislation states that realized capital gains should be declared as personal income tax, the imputation of undistributed profits could provoke a problem of double counting. However, the authors argue that due to the tax exemption of highly traded stock at the beginning of the 2000's, the amount of capital gains declared to the tax agency should be negligible and thus should not be a problem.

more or less the same data treatment to an extended time span (2004–13). This time they used an increasing tax-evasion rate and they imputed 'fundamental accrued' capital gains, a concept that takes into account the costs that firm owners would have to bear if they decided to materialize accrued capital gains. Their results, including all adjustments, do not vary much. They find that the top 1 percent share ranges between 32 percent and 33 percent of total income.

The study that uses the most precise dataset and methods in the Chilean context is clearly Fairfield and Jorratt De Luis (2016). The authors had access to micro data on income-tax declarations for two specific years: 2005 and 2009. They were able to compute estimates based on quasi-individual data, which provided rich information on income composition, allowing to link firms' profits to firm-owners and even re-ranking individuals for different income definitions. They start by studying total declared income (Y_{Rlzd} in their article), including pensions, wages, which are gross of social security contributions, income from independent work, distributed profits and both taxable interests and rents. Before applying any adjustment to individual income, they obtain a top 1 percent income share close to 15 percent. In order to adjust for tax evasion, they assumed that the aggregate difference between income declared to the tax agency and that recorded in the National Accounts was fully due to tax evasion. They thus scaled different types of income proportionally to fit the national-accounts levels. Their resulting estimates are, despite noteworthy differences in methods, rather similar to those of López *et al.* (2013), with a top 1 percent income share around 22 percent. Following López et al. (2016, 2013), the authors also make the imputation of retained corporate profits. As mentioned, they were able to track firm-ownership and impute corporate accrued profits to owners. They were able to accurately impute 80 percent of firms' accrued profits to their owners, with almost 30 percent of these being associated to foreigners and thus not included in their estimates. The remaining 20 percent of firms, whose owners were not identified, were then imputed to the distribution. They provide various estimates according to the different assumptions that were made during the imputation of the remaining part of accrued profits, and to whether or not they included tax-evasion adjustments. Their benchmark estimates including both tax-evasion adjustments and the imputation of accrued profits are, again, rather close to those of López *et al.* (2013) with a top 1 percent share of around 32 percent of total income.

As we can see, previous research on this topic provides useful benchmarks for our estimates. It also provides us with useful guidance on Chilean institutional specificities for our assessment of medium and long-run trends of income concentration.

3. DATA, DEFINITIONS, AND METHODS

This section describes the main data sources and the income definition used to build our top-income shares, which are presented in the following section. It also provides details on the adjustments that were made to the data, before commenting on the issue of corporate profit retention and incentives. The section ends with the presentation of population estimates and the interpolation method.

3.1. *Tax System and Data*

Personal income tax declarations are a key input for the construction of our estimates. It is from the interpolation of these data that the numerator of income shares is constructed. But before describing the structure of our data, a few comments on the Chilean tax system are needed.

The Chilean income tax is built around a 'global' tax (*Global Complementario*, in Spanish) that is paid by residents once a year and integrates mainly two different taxes that classify income based on their source. One of them is the first-category tax (*Primera Categoría*), which is charged to capital income and the other is the second-category tax (*Único de Segunda Categoría*), which is imposed on labor income. The latter is progressive, generally levied on a monthly basis and is declared by employers, while the former is a flat tax applied to both corporations or individuals receiving business or rental income (i.e. interests, dividends, withdrawals, rents). The tax that is paid by the self-employed, whose income is generally considered to compensate both capital and labor, depends on the type of invoice they give to their customers. Those giving invoices for services pay the second-category tax, while those that give commercial invoices pay the first-category tax. Both category taxes serve as a tax credit for the global tax, which has the exact same progressive marginal tax rates than the second-category tax. Our top-income shares are estimated using two different series of income declarations. First and foremost we use declarations to the global tax, which exist for almost half a century (1964–2017). The share of the adult population declaring in this series globally increases during the period, from around 5 percent of adults during the second half of the 1960s to 15–20 percent during the last 15 years (Figure A.1(a), in the Online Supporting Information). Since 1972, some individuals earning below a cutoff are exempt of declaring to the global tax—they are only subject to the second-category tax— we thus use a second shorter series that includes declarations by these individuals too: we call it the 'consolidated' series (2005–17). This series covers a substantially higher share of the adult population, including around 70 percent of it during the period. Yet, in the same series only 10–15 percent of adults are actually subject to positive marginal tax rates (Figure A.1(b)). Our estimates are directly computed from the consolidated series when it exists and from the global tax series for 1972 and earlier years. In both cases our whole target population is included. That is, the full population of adults that declare income. For years between 1972 and 2004, we use global tax series after applying a small adjustment factor to account for exempt individuals in each fractile. We present more details on this adjustment in Section 3.2.

The data of the income declarations are in tabulated form. We always have— at the very least—information on marginal tax rates, quantities of people, and the total income declared at each income interval on a yearly basis. Depending on the time period, the level of detail and the number of intervals recorded on them vary. For instance, for the early years (1964–81), global tax declarations were transcribed from official publications, which divide people into a range of from four to 20 income intervals. The data for the period from 1990 to 1995, which were provided as unpublished data by the tax agency, divide people into 15–20 intervals. The most detailed tables are those of the global tax series for the period from 1996

to 2009, which classify declarations into 43–65 intervals and also remain unpublished. In the consolidated series (2004–17), declarations are divided into eight intervals, which are organized according to the different tax rates that are applied to them. This series is publicly available on the tax agency's website, along with a series of the same characteristics including declarations to the global tax alone. Furthermore, there are some missing years in our dataset. Specifically, declarations for income year 1977 (that is, tax year 1978) could not be located even at the headquarters of the tax agency itself, or in any of the major local libraries. This punctual discontinuity may be odd, but the disappearance of data covering the 7 years between 1982 and 1989 is even more intriguing. In any case, this kind of situation is to be expected in a dictatorship scenario.

3.2. *Data Corrections*

Since 1972, some adults have not been required to file income declarations for the global tax described in the previous section. Individuals receiving wages from a single employer are exempt from filing declarations to this tax, as they are only subject to the second-category tax. Because this is a potential limitation for our global tax declaration series, during the period from 1973 to 2003, we applied small adjustments to account for missing declarations. Although on the aggregate, a big part of individuals are likely affected by this exemption, we only expect a small part of them to be top-income recipients, as richer individuals usually tend to have a broader variety of income sources and thus to be subject to the global tax. In fact, when both of our series overlap, we observe that the discrepancy in the average income is generally lower for higher fractiles (Figure A.2).

We thus use data from this overlapping period between the global tax and the consolidated series (2004–12) to estimate adjustment factors. In practice, we compare the average income of the richest fractiles in both series. We find that the mean income of the top 1 percent is close to 9 percent higher—as a geometric average—in the consolidated series relative to the global tax series. We then use this simple estimate as a scaling factor (≈1.09), applying it to the average income of the top 1 percent of individuals in the global tax series for the period from 1973 to 2003. This adjustment represents an increase of less than 1 percentage point in the group's income share. Estimates for wealthier groups are built following the exact same rationale. The average income of the richest 0.1 percent and 0.01 percent is adjusted by scaling factors close to 1.1 and 1.001, respectively, during the period from 1973 to 2003.

3.3. *Income Definitions*
3.3.1. Fiscal Income

The top-incomes literature has traditionally studied what is referred as *fiscal* income, which includes all types of income that are reported to the tax authorities. In the case of Chile, it includes the following: dependent-labor income (wages); the income of independent workers, which is net of the costs incurred in obtaining it; both public or private pensions of any kind; distributed profits (e.g. dividends and withdrawals); interest; rental income; and a very limited part of

capital gains (see Appendix A.2, in the Online Supporting Information). Ideally, all incomes should be *gross* of any deduction or allowance (Atkinson *et al.* 2011).

The definition of fiscal income is generally the opposite of that of taxable income, which is *net* of deductions. However, despite significant efforts to harmonizing the World Inequality Database (www.wid.world), the ideal definition is not always reached. In some cases, the data allow the direct or indirect observation of fiscal income (i.e. with or without making adjustments), while in others researchers are limited to analyzing income with definitions that are closer to taxable income.[5] In the case of Chile, the tabulated data mostly report taxable income. Fiscal income is only reported in 1973, 1996, and 1999. We thus use information from these years to impute back-deducted income for other years, assuming stability through periods without big changes in tax legislation. For instance, between 1964 and 1981, deducted income only included some previously paid taxes.[6] In 1973 (tax year 1974) these added up to 3.8 percent of the average fiscal income of the top 1 percent income share recipients. We thus assume that the ratio between the fiscal and taxable income of the richest fractiles remains stable during the period from 1964 to 1981. After the return to democracy, we observe a higher discrepancy between the income before and after deductions. This mostly happens as a result of the introduction of deductions other than taxes already paid; such as, for instance, deductions on mortgage interest or on non-mandatory contributions to pensions by employers. Total deductions represented 8.5 percent and 8.6 percent of the fiscal income of the top 1 percent income recipients during 1996 and 1999, respectively (see Figures A.3 and A.4). We use estimates from these years to adjust data on the recent democratic period (1990–2017). Many other deductions were introduced during the 2000s and 2010s, but due to data constraints we are unable to make solid adjustments to account for them. Thus, in Appendix A.3, we attempt to assess—based on available data—the potential biasing effect of their omission over our series. There we show that, despite the fact that we cannot adjust for new deductions introduced since 2001, top shares should only be deviated by 0.42–0.55 points during the period.

The estimates that are presented in the following sections do not include any adjustment for mandatory social security contributions (here, we follow Piketty, 2001). We choose to abstain from making this kind of adjustment mainly because pension income is included in our definition of fiscal income; thus, it is not clear whether the simultaneous inclusion of contributions and benefits would present a problem of double counting in the long/medium term and we prefer to avoid any

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[5]Atkinson *et al.* 2011, table 4) show that although most studies work with pre-tax gross income either making adjustments or not, in some countries or some periods, the definition deviates from the benchmark. For instance, in the case of France, even though some deductions are adjusted retrospectively to approximate pre-tax gross income, Piketty (2001) uses income net of employees' social security contributions. Data for the United Kingdom are "net of certain deductions" for years prior to 1975 (Atkinson, 2007). The Irish series prior to 1989 are only available in net terms. In Indonesia, Leigh and Van Der Eng (2010) used net income after personal allowances, excluding farm income.

[6]Between 1964 and 1974, Law 15,564 stated that the only difference between fiscal and taxable income was the subtraction of taxes already paid (Art. 46). These included the first- and second-category taxes and a municipal tax on land and dwellings. Between 1974 and 1986, deductions were defined—and kept practically unchanged—by Art. 55 of Law DL.824. Law 18,489 (Art. 1° No. 15 II), then introduced changes in 1986. Furthermore, this does not mean that in the period from 1964 to 1986, the income tax did not include tax favors to anyone but, rather, that these were applied after the tax was estimated, taking the form of tax credits (see Art. 47).

confusion. In any case, Appendix A.4 presents our estimates including the imputation of social security contributions. We find that although their inclusion decreases the level of top-income shares—close to 1 percentage point on average—the trends are only marginally affected (Figure A.5). As is usual in both the local and international literature, income that is exempt from declaration is not included in the definition of fiscal income. The most relevant item in this category is rental income from "affordable" dwellings, which is completely exempt from being declared to the tax authorities over the whole period. Further comments on the size of exempt incomes can be found in Appendix A.3.

3.3.2. Total Income Control

In order to compute top-income shares, we need to estimate total income for the whole adult population (the denominator). We thus need to build an estimate that approximates what the aggregate amount declared would be if every resident adult filed a tax declaration every year. Following Atkinson *et al.* (2011), there are basically two ways to build such an estimate. The first option is to use the total amount declared by tax filers after adding some income to account for non-filers. The second option is to build an estimate of total household income from the National Accounts. Naturally, it should follow the definition of fiscal income used in the tax data as closely as possible. In this paper, we choose the second option.

The Chilean National Accounts are detailed enough to build the second type of estimate for the period from 1996 to 2017. Table 1 displays the specific items included in its definition. It is equal to the gross balance of primary income received by households, plus social benefits other than transfers in kind paid by financial institutions (including most of pension income), less social contributions paid by households (which includes those at the expense of both employers and employees), less attributed property income for insurance-policy holders, and output for own final use. This latter item mainly consists of imputed rents and the consumption of goods produced within households, neither of which produce tangible income.

Due to data limitations, for the years prior to 1996 we assume that total income is a fixed part of GDP, which is the average value in years with detailed accounts (49.7 percent of GDP). Figures A.6 and A.7 compare total fiscal income, aggregate income-tax declarations, fiscal income including social security contributions,

TABLE 1
TOTAL FISCAL INCOME IN THE NATIONAL ACCOUNTS

	Total Fiscal Income	
(=)	Balance of primary income, received by households, gross	(B.5g)
(+)	Social benefits other than transfers in kind, paid by financial institutions	(D.62)
(−)	Social contributions paid by households	(D.61)
(−)	Attributed property income for insurance-policy holders	(D.44)
(−)	Output for own final use (≈ imputed rents + consumption of own production by households)	(P.12)
(−)	Consumption of fixed capital, households	(K.1)

Source: Compiled by the authors.

and other relevant aggregates, both as percentages of GDP and in real terms (respectively).

3.4. *Tax Incentives and Undistributed Profits*

Some specific tax incentives should be considered when analyzing the distribution of Chilean personal income. Before 1984, the profit of companies with traded stock was subject to a special tax (the *impuesto adicional*) that anticipated the income tax on distributed profits (Cerda *et al.*, 2014). This setup did not provide major incentives to firms to retain profits, because the income tax was already paid before dividends were actually distributed. However, since 1984, the corporate tax of companies has operated as a withholding tax on distributed profits; that is, the corporate tax represents a credit against personal income tax. As a result, profits that are retained within the firm are subject only to corporate tax, while distributed profits may be subject to considerably higher marginal tax rates. This happens because dividends are part of the personal income tax base (Fairfield, 2010; Fairfield and Jorratt De Luis, 2016). Hence, instead of distributing dividends, firm owners can access less-taxed revenue via the realization of capital gains over stocks, which are mostly exempt from income tax. Additionally, in response to the tax structure, individuals often create investment societies exclusively for tax purposes, generally limiting declared income and using retained revenue indirectly (Jorratt De Luis, 2009).

Although the gap between corporate tax and top marginal tax rates has reduced over the past 25 years, it has remained significant throughout the whole period. In 1990, the difference was exactly 40 percentage points, with a corporate tax of 10 percent compared to a marginal top rate of 50 percent. However, the gap is progressively being reduced, and during the greater part of the 2000s it stayed at 20 points, with a corporate tax of 20 percent and the top marginal rate of personal tax at twice this amount (Figure A.8).

Alvaredo *et al.* (2016) define the aggregate amount of pre-tax undistributed profits as the net primary income of the corporate sector in the National Accounts (both financial and non-financial). Using this definition, it appears that undistributed profits increase substantially as a share of GDP during the period from 1990 to 2017 (Figure A.9). They increase from around 4–5 percent during the late 1990s and early 2000s to 8–10 percent over the past 5 years. The most significant increase takes place around the middle of the 2000s. The symmetric progression of household income and undistributed profits suggests that there may be a substitution effect, where a part of household income would have been progressively shifted to be recorded as undistributed profit. Since corporate ownership is highly concentrated in Chile (Fairfield and Jorratt De Luis, 2016), a substitution effect would likely introduce a noticeable downward bias in the trend of personal income inequality. We proceed in Section 4.2 to the imputation of undistributed profits to the fiscal-income distribution.

3.5. *Total Population and Interpolation Method*

In order to calculate income shares accurately, we have to determine which individuals will be considered in our total population. The main issue here is to

establish whether income declarations are filed on an individual or household basis. Income has been declared individually for the full period under study. Hence, for our estimations, the population total will be—as is common in the top-incomes literature—individuals over 20 years old. Our source is the World Bank's "World Development Indicators" database.

The method we adopt to interpolate between given points in the fiscal tabulations is different from the classic Pareto interpolation and the "mean split histogram" method that were generally used in earlier fiscal-income studies. Here, we use the generalized Pareto interpolation (GPI), which is described in detail by Blanchet *et al.* (2017). Essentially, the technique allows the income distribution to have a varying Pareto coefficient (the average income above a given threshold divided by the threshold itself) that changes across the income distribution, using the information from each income interval of the tabulation. The Pareto coefficient usually follows a U-shape. The GPI is a non-parametric method that has been shown to produce more precise estimates than previous techniques, especially while extrapolating to higher shares of the population.

4. RESULTS

This section starts by displaying the results of both our fiscal-income (Section 4.1) and adjusted series (Section 4.2). Both medium and short-run trends in each series are commented and general historical context is provided without aiming to claim any causal effect. The section ends with the analysis of the distribution of real income growth (Section 4.3).

4.1. *Fiscal-Income Series, 1964–2017*

Figure 1(a) presents the progression of the top 1 percent, 0.1 percent, and 0.01 percent shares of income over the period from 1964 to 2017. In a general perspective, during the first two decades, concentration remains relatively low—with top 1 percent income shares close to 13 percent on average—and follows a decreasing trend. This evolution is suddenly interrupted in 1974, when concentration quickly escalates, reaching a top 1 percent close to 17 percent in 1981. This series is interrupted for the following 9 years, until the end of Pinochet's dictatorship. In 1990, income concentration at the top is even higher, with a top 1 percent close to 18 percent of fiscal income. It then starts a slowly decreasing trend over the next two decades, reaching levels close to 14 percent in 2013. The series ends with a short trend reversal that results in a near 2 points increase in the top 1 percent share over the final 4 years with data. In what follows, more detailed comments are provided for each of the three periods that we identify based on trends and political context: the "early years" (1964–73), the "dictatorship" (1974–89), and the "return to democracy" (1990–2017).

Early Years, 1964–73 In Chile, as in Latin America and the rest of the world, the 1960s were a time of increasing political polarization. The recent Cuban revolution (1959), combined with decades of increasing demands for justice by workers, influenced by socialist philosophy, put social issues at the center of the political debate. Along the same lines, the building of the Berlin Wall (1961),
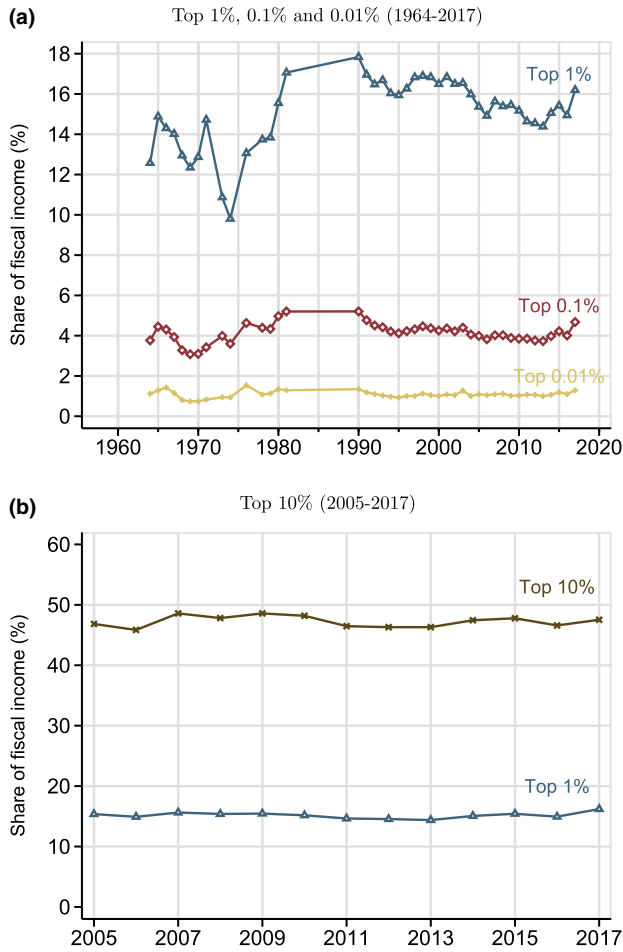
(a)

Top 1%, 0.1% and 0.01% (1964-2017)

(b)

Top 10% (2005-2017)

Figure 1. Top Shares of Fiscal Income
Source: Authors' calculations using tabulated income tax declarations, the National Accounts, and population estimates.
Notes: The top 10 percent income shares are constructed using the consolidated series exclusively (see Section 3.1). [Colour figure can be viewed at wileyonlinelibrary.com]

the Cuban Missile Crisis (1962), the Brazilian military coup (1964), and other ongoing armed conflicts relating to the Cold War contributed to the increase of tension and anxiety among civilians. In the national political context, two consecutive left-wing presidents governed Chile during this period: E. Frei-Montalva (1964–70) and S. Allende (1970–3). The mandate of the latter was brought to an abrupt end by a *coup d'etat* in 1973. Both presidents are widely recognized for implementing socially oriented policies. Among the most high profile of their reforms were land reforms and the nationalization of the domestic mining industry. The radical nature of these reforms gradually increased over the course of the decade.

The tax reform of 1964 sets the starting point for the series displayed in Figure 1(a). It introduced—among other rules—the first legal definition of income for tax purposes and raised the top marginal rate from 35 percent to 60 percent.[7] Figure 1(a) shows that the top 1 percent share increases from 12.5 percent to 14.8 percent of total income between the first and second years. However, after 1965, a rather sustained downward trend prevails for almost a decade, reaching the lowest point (10.8 percent) at the end of the period, in 1973. Only two exceptions appear in this trend in 1970 and 1971, where the top 1 percent share increases rather abruptly. The interpretation of this phenomenon is not clear. Given that this was the first year of the presidency of S. Allende, typified by the implementation of radical socialist reforms, it is difficult to imagine that the richest individuals increased their share of total income. One possible explanation is an increase in the enforcement of tax collection, which may have targeted the rich in particular. However, we exclude the possibility of this increase being due to variations in the denominator of our top-income shares, as GDP per capita did not fall, but actually increased that year (Larrain and Meller, 1991).

The data for 1972 are missing, since only 0.3 percent of the total adult population declared income to the tax agency for that year (Figure A.10), which is not enough to be able to estimate the share of the richest 1 percent of the population. We chose to exclude estimates of the top 0.1 percent and 0.01 percent shares as well, as they are likely to be heavily compromised, given the turbulent political scenario and large-scale economic crisis that characterizes that particular year, for which income was declared only a few months before the military coup of 1973.[8]

Dictatorship, 1974–90 In the wake of the military coup of September 11, 1973, a government board composed mainly of military generals was created to govern the country. However, A. Pinochet quickly took over power and was named president by a decree toward the end of 1974. The military dictatorship lasted for 17 years. Inspiration for the government's economic policy was closely related to monetarist ideals. The main reforms included the privatization of public firms, budget cuts for social spending, a change of currency, and the liberalization of the labor market. The latter was enforced by the most violent repression of demonstrations, unions, and political activity.

The trend in income concentration during this period is rather clear and stable, at least for years for which tax declarations are available. The top 1 percent share increases by 7.2 points between 1974 and 1981, rising from 9.8 percent to 17 percent over 7 years. Figure 1(a) does not display top shares for the year 1975.

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[7]Although there is information available on income declarations for two earlier years (1962 and 1963), we judge it to be inconsistent with the rest of the series, as the reform affects income received since 1964.

[8]Between 1970 and 1973, a large-scale operation to destabilize the Chilean economy was taking place, coordinated jointly by U.S. officials and the Chilean economic elite. In a report released on September 18, 2000, the CIA describes in detail its activities in Chile intended to prepare the ground for a military coup. These interventions included distribution of propaganda in association with the local press, financing of the political opposition, planning the coup alongside Chilean military officials, providing intelligence, and even offering large sums of money to Allende in exchange for his resignation, which he declined (https://www.cia.gov/library/reports/general-reports-1/chile). Another factor that likely compromises estimates for 1972 is the migration of many wealthy individuals as a response to Allende's government.

We consider estimates for that year to be somewhat inconsistent. Indeed, if we were to include estimates for that year, the top 1 percent share would jump to an ephemeral 25 percent of total income for that particular year. However, the increase in total income declared to the tax agency during that year does not correspond to any sizable change in the filing population (Figures A.1(a) and A.6). The most likely explanation for the phenomenon is that the country was going through one of the most serious economic crises of recent decades. Indeed, real GDP per capita fell 10 percent in 1975 and inflation also reached peak levels (Figure A.11). Moreover, since our estimates of total income are based on a fixed share of GDP for these years, we judge them to be rather sensitive and not sufficiently reliable in this kind of exceptional situation.

Inconveniently, the data for 1977 (1978 tax year) could not be found. However, what is even more remarkable is the absence of data for the whole period between 1982 and 1989. Tabulations for those years appear to have either disappeared or never existed. It is during the 1980s that the highest concentration of income is documented Sanhueza and Mayer (2011); however, we are unable to comment on that specific period. Moreover, it is in 1984 that the most significant tax reform in our series takes place. In the name of boosting savings and investment, incentives for profit retention were introduced, along with the core of the integrated tax system that has prevailed throughout the post-dictatorship democratic years (see Sections 3.1 and 3.4).

Return to Democracy, 1990–2017 Chile returned to democracy in the middle of the most accelerated economic boom of its history.[9] The transition was a peaceful one, as it was organized in a way that ensured political stability as a priority. At the beginning of this period, most of those who had participated in the military government organized themselves into right-wing political parties. Only a portion of those who had participated directly in ordering human rights violations were tried and imprisoned. Pinochet himself, however, remained as a lifelong senator and retained his post as general commander of armed forces until 1998. In parallel with this reshuffle, opposition parties were legalized. Furthermore, a succession of four center-left presidents held office over the next 20 years, followed by a center-right president between 2010 and 2014, and then another center-left mandate for the rest of the period. The majority of the reforms over the period were aimed at the expansion of social security coverage and the reduction of poverty (Contreras and Ffrench-Davis, 2012). Nonetheless, the foundations of the socioeconomic model established by the dictatorship remained in place, as reforms in education, health, pensions, and housing continued to be mostly based on private markets.

Figure 1(a) shows that the concentration of income in the richest 1 percent of the distribution generally decreases over the democratic period, from 17.8 percent in 1990 to 16.2 percent in 2017—that is, a fall of 1.6 points overall. Looking in greater detail, an accelerated decrease takes place during the first half of the 1990s. Indeed, the 2-point decrease in the top 1 percent share between 1990 and 1995 is greater than the total fall that took place during the period. Between 1995

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[9]The so-called "Chilean miracle" refers to the period of high economic growth rates between 1985 and 1997. It corresponds in part to the fast economic recovery following the economic crisis of 1982, and in part to actual growth relative to the level of real GDP per capita in 1981.

and 1997, part of this progression is reverted as income concentration in the top 1 percent share increases close to 1 point. It then stabilizes around values close to 16.5 percent during the following 6 years. It should be noted that top shares seem to be relatively resilient to the Asian crisis (1997), which had the most severe impact in the Chilean economy in 1998 and 1999, two years with negative GDP growth.

From 2003, top shares appear to fall quite steadily during a full decade, with a top 1 percent share losing a bit more than 2 points overall. By the end of the democratic period, what seems to be a trend reversal can be perceived. However, it is not clear how this information should be interpreted. We judge that four data points are not sufficient to consider this a sustained trend. Evidence on these years should be treated with caution, as at least a part of the recent evolution could be explained by behavioral changes due to new incentives introduced by the tax reform of 2012, mainly through the limitation of the recourse to special tax regimes (see Appendix A.5). However, the sharp increase in top-income shares observed in 2017 does not seem to be an artificial one. As we show in the following sections, it occurs in parallel with a fast increase in the real average income of top groups—especially those at the very top (see Section 4.3). In addition, the same year, inequality within the top 1 percent also increases sharply (Section 6) without any significant change in the filing population or in the total income declared to the tax agency (Figures A.1(a) and A.10(b), respectively). In any case, further investigation is needed to assess whether the trend in income concentration has been actually reverted around 2013.

Figure 1(b) displays the fiscal-income share of the top decile, which varies between 46.7 percent and 49 percent over the period. The upper shares—such as the top 0.1 percent and 0.01 percent—generally follow the same trends described by the top 1 percent, but with a lesser degree of variability.

4.2. *Adjusted Series Including Undistributed Profits, 1990–2017*

In this section, we build a simple yet straightforward approximation of the effects of imputing the whole amount of undistributed profits described in Section 3.4 to the top-income shares of Section 4.1. Previous works have highlighted the relevance of this kind of operation, due to the presence of tax incentives favoring the artificial retention of profits within corporations (López *et al.*, 2016; Fairfield and Jorratt De Luis, 2016). Here, we aim to assess the impact of such operation over a relatively longer period, which allows the assessment of potential repercussions in the trend of income concentration.

To do so, we use estimates from Fairfield and Jorratt De Luis 2016, table A.9) on the distribution of the stock of retained profits, which have been accumulating since 1984. They found that the richest 1 percent in the fiscal-income distribution owned 75 percent of it in 2005.[10] Their next observation—in 2009—records a lower concentration, at 69 percent. We thus make different assumptions to

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[10]Fairfield and Jorratt De Luis (2016) use a rather similar definition of fiscal income to ours (see Section 3.3.1). We know only of two differences between theirs and our own. First, they include employees' social security contributions, while our benchmark estimates do not. Second, our income tax declarations were reported before the tax agency's control for errors and frauds, while they could access the data after inspection.
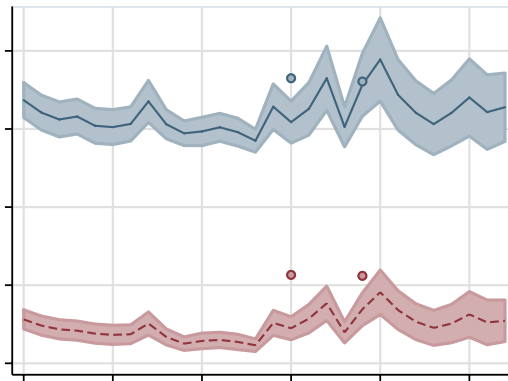
Figure 2. Top-Income Shares Including Undistributed Profits, 1990–2017
Source: Authors' calculations using top-income estimates from Section 4.1, the National Accounts, and estimates by Fairfield and Jorratt De Luis (2016).
Notes: The whole value of the undistributed profits is imputed to the fiscal-income distribution. The central lines are the averages of the upper and lower bounds. Comparable estimates for the years 2005 and 2009 by Fairfield and Jorratt De Luis (2016) are represented by the circles above each curve. [Colour figure can be viewed at wileyonlinelibrary.com]

construct upper and lower bounds, by conjecturing that flows follow more or less closely the same pattern as stocks. Our higher-bound assumption is that flows are exactly as concentrated as stocks. As one could argue that flows may be less concentrated: our lower-bound assumption is that the concentration in flows is two thirds the concentration in stocks for 2005 and 2009. In terms of the trend, for years before 2005 both our upper and lower bounds assume that undistributed profits are as concentrated as in 2005. Then, between 2005 and 2009, both series follow a linearly decreasing pattern of concentration, which mimics what is observed by Fairfield and Jorratt De Luis (2016). However, after 2009, our lower-bound estimates assume that the same linearly decreasing trend will continue until the final year, while the upper-bound estimate assumes that the concentration remains constant, at the same level than in 2009. As an illustration, for 2017 the lower-bound assumption is that "only" 37.8 percent of undistributed profits is owned by the richest percentile in the income distribution, while the upper-bound assumption is 69 percent. Furthermore, Fairfield and Jorratt De Luis (2016). find that nearly one third of the accrued profits in their data are owned by foreigners. They thus exclude that part. Such adjustment is unnecessary in this case, because our estimate, which comes from the National Accounts, does not include the part held by foreigners in Chile.

Perhaps the most striking finding in Figure 2 is that despite extremely conservative assumptions in the lower bound, considerable changes in trend directions emerge relative to unadjusted estimates in all cases. It thus appears reasonable to conclude that these estimates do not follow the same decreasing trend as fiscal-income estimates. They most probably follow a U-shape over the past 27 years. Moreover, it seems that our top 1 percent share estimates are fairly consistent with comparable estimates by Fairfield and Jorratt De Luis (2016) in 2005 and 2009,

which are represented in Figure 2 by blue and red circles.[11] Our estimates are, however, slightly lower and they follow an increasing trend when those of Fairfield and Jorratt De Luis (2016) are stable. In the case of the top 0.1 percent, the discrepancy is even bigger. Differences in levels can be explained by the fact that Fairfield and Jorratt De Luis (2016) used microdata, which allow re-ranking of the distribution after imputation, which we cannot do. Differences in the trend may result from structural differences in data sources. The authors use net accrued profits declared to tax authorities, while we use National Accounts aggregates, which—unlike their estimates—also include retained profits held abroad by Chilean nationals and firms.

4.3. *The Distribution of Income Growth*

Fiscal-Income Series, 1964–2017 Figure 3(a) shows the evolution of real average income as an index—base 100 in 1964—in different groups of the population: the top 0.1 percent, the next 0.9 percent (i.e. P99–P99.9), and the rest of the population, which is the bottom 99 percent. Of course, these groups do not necessarily include the same people every year, as intergroup mobility is possible. The highest fractiles saw their income grow the fastest during the period. The average income of the top 0.1 percent was multiplied 11.6 times between 1964 and 2017. The income of the next 0.9 percent grew even more, as it was multiplied by a factor of roughly 12.3 during the same period, while that of the bottom 99 percent increased by a factor of 9.[12] Interestingly, it is during year 2017 that the income of the highest share grew the most, reaching almost the same level as P99–P99.9.

Series with Undistributed Profits, 1990–2017 Figure 3(b) displays the average income of the same groups as shown in Figure 3(a), but for a shorter period and including the imputation of undistributed profits. Although these groups follow different paths, their total growth is rather similar at the end. Indeed, both the top 0.1 percent share and the P99–P99.9 have their income multiplied by a factor of roughly 2.7, while the bottom 99 percent is not far off, with a factor of 2.8. These findings are in line with the U-shape that is described by the top 1 percent share in Figure 2. It is also worth stating that the bottom 99 percent is likely to be a somewhat heterogeneous group. Because tax data only cover a limited part of the adult population (Figures A.1(a) and A.1(b)), we cannot use them to further decompose the bottom 99 percent for the study of, for instance, the evolution of median incomes. However, a reasonable approximation should be provided by the CASEN survey, if we assume that median income earners are not subject to income tax and nor are they recipients of undistributed profits. These can be considered prudent assumptions, given that no more than 20 percent of adults have been above the taxable threshold since 1990 (Figures A.1(a) and A.1(b)) and that accrued profits are extremely concentrated at the top of the income distribution (Fairfield and Jorratt De Luis, 2016, table A.9). Using a definition that is comparable to fiscal income in the survey, we find that the median is—as top average incomes—also multiplied close to 2.7 times

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[11]We refer to the Y_{AcrdProf} definition of income, which is fiscal income with accrued profits instead of distributed profits. Since they used individual income declarations matched to firm data based on ownership, they were able to use accrued profits, which are the sum of retained and distributed profits at the firm level.
[12]The bottom 99 percent income is estimated residually using total income.

(a) Fiscal income series (1964-2017)

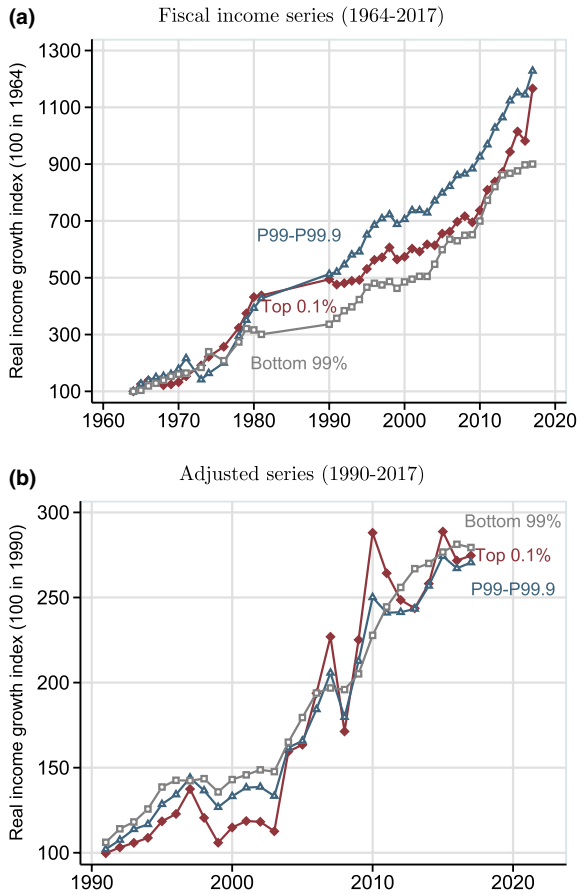**(b)** Adjusted series (1990-2017)

Figure 3. Real Income Growth: Top 0.1 Percent, Next 0.9 Percent, and Bottom 99 Percent
Source: Authors' calculations using tax data, the National Accounts, and population estimates.
Notes: The average income of the bottom 99 percent of the population is estimated residually using income information for the top 1 percent (tax data) and total income (National Accounts). [Colour figure can be viewed at wileyonlinelibrary.com]

through the period (Figure A.12). This finding can be somehow reassuring, especially compared to recent estimates for the United States (U.S.), where Piketty *et al*. (2018) find that real median incomes have stagnated over recent decades. However, it should be noted that the fact that groups have similar growth rates does not imply that the income growth of households was equally distributed. Rather, it is the result of relatively stable levels of inequality. For instance, if we observe a stable top 1 percent share close to 22 percent of total income over a certain period, 22 percent of the income growth of all households will be mechanically captured by the top 1 percent.

5. Comparison with Other Estimates

This section puts our top-income shares estimates in perspective by comparing them with those of other countries but also with those that result from

a nationwide representative survey (the CASEN survey). For comparisons with estimates from the previous literature, see Figure A.13 and Appendix A.4.

5.1. *International Comparisons*

Figure 4(a) compares both adjusted and unadjusted estimates to top shares of fiscal income in other Latin American countries. These correspond to top shares found in the World Inequality Database (www.WID.world), using the definition of fiscal income and its distribution at the individual level. None of these countries include capital gains in their income definition. Unadjusted estimates place Chile at a similar level as Argentina and Uruguay, for years with overlapping series. Colombian and Brazilian estimates are both always higher than the Chilean fiscal-income series, with gaps that go as far as 5 or 10 points. This ranking seems odd, especially when comparing with Uruguayan estimates. The country is recognized as one of the least unequal in the region, with official Gini coefficients close
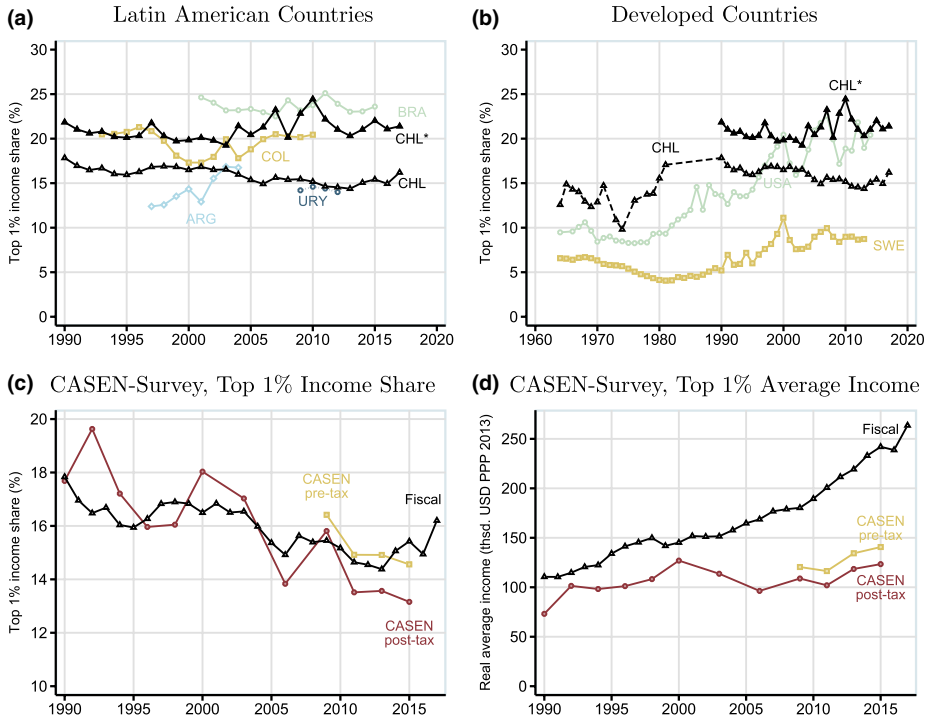

Figure 4. Comparing Estimates across Countries and across Datasets
Sources: Data for countries other than Chile were retrieved from www.WID.world. In (c) and (d), we use the CASEN survey's *original* income series; that is, without the adjustment to fit National Accounts aggregates that was applied by CEPALSTAT.
Notes: Hollow triangles represent estimates for the Chilean fiscal-income series, while full triangles represent the adjusted series (central trend described in Section 4.2). Estimates for Latin American countries correspond to the definition of fiscal income excluding realized capital gains, while those for the U.S. and Sweden include them. [Colour figure can be viewed at wileyonlinelibrary.com]

to 0.4 after 2012, while Chile generally ranks closer to Brazil and Colombia (OECD, 2015).[13] We judge that Chilean tax legislation and incentives make unadjusted estimates hardly comparable with those of other countries, which do not necessarily have the same incentives. For instance, in Brazil, most dividends are completely untaxed; thus firms do not have incentives to retain profits as a way to avoid higher taxes. Of course, our estimates, including the imputation of undistributed profits, are not fully comparable either, because other countries do include similar imputations of undistributed profits or capital gains.

Figure 4(b) compares our estimates with those of two developed countries that include capital gains: the U.S. and Sweden. Since capital gains are generally included in the income definition as a way of indirectly measuring the impact of corporate accrued profits on personal income distribution (Atkinson *et al.*, 2011), these estimates should be somehow more comparable to the Chilean adjusted series. We chose these countries to show extreme cases in the developed world: the U.S., an icon of inequality; and Sweden, a country with relatively stable and low levels of income inequality. Both countries have experienced increases in income concentration over recent decades. In this case, Chile records a higher concentration than both countries, at least between the 1960s and the 2000s. It appears that the increase in inequality in the U.S. in recent years has brought the country close to the level of income concentration that is recorded in the Chilean adjusted series. Both range between 20 percent and 25 percent of total income for the richest top 1 percent. For the years prior to 1990, even the unadjusted series for Chile is considerably higher than both developed countries, with nearly 5 points' distance from the U.S. and 10 from Sweden.

5.2. *Local Surveys*

This section measures the error with which top incomes are estimated in the most popular local household survey (CASEN). For years with sufficient information (2009–15), we use the survey to build a definition of personal income that is comparable with that derived from the fiscal data. Perhaps the most important step in this endeavor is to obtain pre-tax income based on post-tax income. This retroactive transformation is non-trivial, as it requires several fiscal rules and different marginal tax rates to be applied. For this purpose, we build on a similar work by Martínez-Aguilar *et al.* (2017). These estimates, along with a longer series with post-tax income, are compared here to our fiscal-income series (from Section 4.1). Both of our survey estimates are based on CASEN's *orginal* income series.[14]

Figure 4(c) compares top-income shares from both survey and tax statistics between 1990 and 2015. As expected, the survey data estimates are more volatile than those from the tax data. However, for some years, the survey estimates are

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[13]Moreover, according to the Forbes list of 2017, Chile has the third-highest absolute number of billionaires in Latin America, with 12. The country is only surpassed by Mexico, with 15 billionaires in a population more than seven times larger, and Brazil, with 43 billionaires in a population more than 11.5 times larger.

[14]CASEN's datasets included income adjustments to fit aggregated levels of the National Accounts. Both the original and the adjusted incomes are publicly available for each year for which data is available (since 2013). Bourguignon (2015) states that this kind of adjustment, applied by the Economic Commission for Latin America and the Caribbean (CEPAL), probably induces considerable biases for the study of the income distribution and thus should be avoided. For more comments on this issue, see Appendix A.6.

rather close to or even higher than the tax estimates, which can seem counterintuitive. But this does not imply that they are measuring the same phenomenon. There are considerable differences in the structure of the estimates in both the numerator and denominator of the income shares. For instance, the total income (denominator) in the tax series is always higher than the one used in surveys. Between 2009 and 2015, it is nearly 56 percent higher on average than in the pre-tax definition, and 63 percent higher than in the post-tax definition. The difference is greater when comparing the income of top groups (numerator). For instance, in the same period, the average income of the richest 1 percent is nearly 64 percent higher than in the survey's pre-tax series, and 86 percent higher than post-tax income.
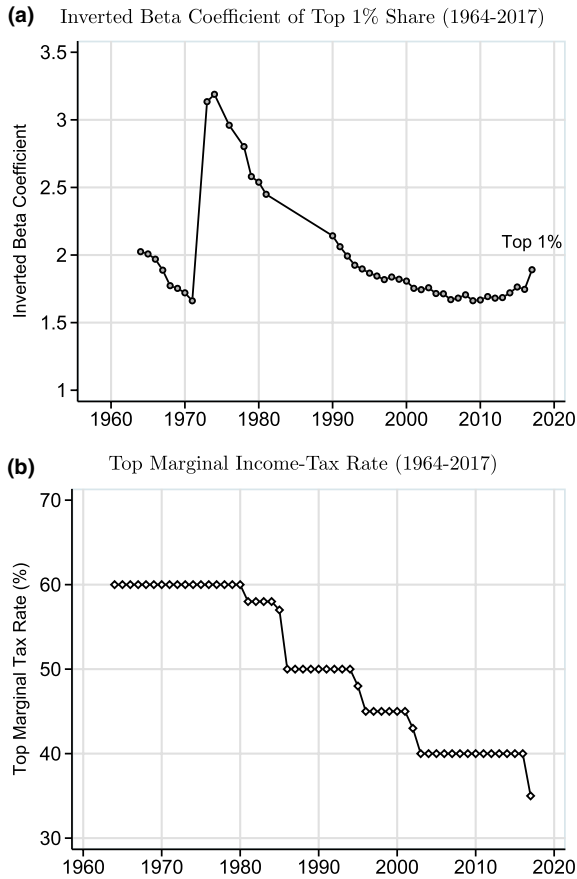
Figure 4(d) displays the evolution of average real income in the top 1 percent of each series (in 2013 PPP USD). The distance between the tax data series and the survey post-tax series increases throughout the whole period. For the pre-tax series, we can draw the same conclusion, but only for a limited time period. It seems that the bias toward lower average incomes in the survey is increasing over the period.

6. Trend Robustness

A recurrent criticism of top-income studies is that top shares may be too sensitive to estimates of total income. Indeed, poorly detailed National Accounts could be responsible for a major part of what we perceive as income-concentration trends, especially when total incomes are estimated as a fixed share of GDP. Figure 5(a) presents the inverted beta coefficient of the top 1 percent share estimates presented in Section 4.1. It is defined as the ratio of the top percentile's average income to its threshold (P99). It provides a measure of inequality within the top 1 percent share that is independent of total income estimates. Figure 5(a) describes a generalized decreasing trend of inequality during the 1960s. It then shows a sharp jump in 1973—at the very beginning of the military dictatorship— where inverted beta coefficients start to decrease until the beginning of the 1980s, and yet stay at remarkably high levels. Finally, we observe the continuation of a decreasing tendency for most of the democratic period, which is then inverted in 2013.

Although the beta coefficients mostly confirm the trends described by the top-income shares in Figure 1(a), there is a short period where they follow opposite directions; that is, during the first half of the military dictatorship (1973–81), where the beta coefficients decrease while the top-income shares increase. During that period, the real average income of those in the top percentile increased substantially faster than the income of those in the remaining bottom 99 percent of the distribution (Figure 3(a)). The former group saw its income multiplied close to 2.7 times, while the latter increased only 1.6 times. Their real income grew even faster than real GDP during the same period (2.1 times), which explains the increase in overall concentration recorded by the top-income shares.[15] Now, the beta coefficients indicate

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[15]The trend is consistent with what is observed by Contreras and Ffrench-Davis (2012), who highlight major labor reforms against workers and unions in 1973, high unemployment due to economic crisis in 1975, privatization of major public companies, and generalized cuts to social spending as some of the plausible causes.

Figure 5. Inverted Beta Coefficients and Top Marginal Tax

Sources: (a) Authors' calculations using income-tax declarations and the GPI method described in Blanchet *et al.* (2017). The coefficient is equal to the ratio of the top percentile's average income over its threshold. (b) The tax agency's publications: *Boletines de Estadística Tributaria*. [Colour figure can be viewed at wileyonlinelibrary.com]

that inequality within the top percentile remained exceptionally high and yet decreased during that process. Such a progression is likely explained by the consolidation of an economic elite that not only includes extremely rich individuals (i.e. the top 0.1 percent) but also the "moderately" rich (i.e. P99–P99.9), which is actually the group that saw its real average income grow the fastest during the period (Figure 3(a)).

A strong negative correlation is generally found in the literature between top incomes and top marginal tax rates (Alvaredo *et al.*, 2013). Some interpretations of this result are often used as an argument to hinder the validity of top-income trends, as these could be the result of behavioral responses rather than real changes in the distribution. For instance, a fall in top marginal tax rates would offer less in the way of incentives for wealthy individuals to seek tax-avoidance strategies, possibly causing an increase in their declared income that would be completely unrelated to the actual distributional trends. In the case of Chile, a simple regression shows that the

negative relation is verified in the long run (Figure A.14).[16] Furthermore, Figure 5(b) shows that top marginal tax rates decrease monotonically during the period, following a similar trend to the one described by tax-evasion rates on the first-category tax found in the literature, which includes evasion by both individuals and corporations (Figure A.15). If these trends were affecting our estimates, it would mean that the top incomes at the beginning of our series would be relatively underestimated, while the estimates at the end of it would be overestimated. The result would be a somehow flatter curve, which can be pictured by slightly rotating Figure 1(a) anticlockwise. However, in the light of the new tax incentives toward profit retention that were introduced with the tax reform of 1984 (Section 3.4), one could conjecture that the high evasion rates that are observed before 1980 were replaced by legal schemes that gave access to lower tax rates without the need to evade taxes, thus decreasing the evasion rates without necessarily implying an increase in declared income. We judge that it is unlikely that evasion trends are affecting our trends significantly. Of course, an ideal way to test these conjectures would be to adjust for tax evasion and to impute, at the same time, undistributed profits over the whole period, yet the Chilean data from both the tax statistics and the National Accounts are insufficiently detailed to make this possible.

7. Conclusion

This paper has aimed to establish personal income concentration levels and trends from a historical perspective, based on the best data available. The fiscal-income estimates start with relatively low levels and a decreasing trend over the 1960s. They then experience a fast increase during the dictatorship years (the mid-1970s and 1980s). Since the return of democracy (1990), we observe a high yet slowly decreasing concentration for more than two decades. The series ends with a short trend reversal during the last four years with data. These estimates seem to be resistant to potential flaws in our total income estimates, and likely to tax-evasion trends as well. Furthermore, our fiscal data prove to be consistently better than the CASEN survey at describing what happens at the top of the distribution. We also find that since the beginning of the 2000s, undistributed profits have been increasing considerably as a share of national income. The parallel reduction of household income during the same period seems to confirm the concern voiced in previous literature that the Chile-specific institutional structure would incentivize the retention of corporate profits within firms, while allowing their owners to access them in less detectable and therefore less taxable ways. We go further by finding that not only the level, but also the trend, in income concentration may be biased. We question the decreasing trend in income concentration that appears in both the survey and fiscal-data estimates, at least since the early 2000s. The evolution of undistributed profits most likely played a role in pushing those trends downward. It is thus crucial to study the joint evolution of corporate

[16]Although, historically, a very small fraction of the population is affected by the maximum tax rate—only 0.6 percent of adults in 2017 and 0.004 percent in 1964—we use them here as a proxy for high marginal tax rates, which have followed the same trends.

and personal income in order to analyze the whole picture and identify more informed inequality trends in the Chilean scenario. Naturally, further research is needed in order to assess whether this change in trend is found when analyzing a corrected version of other more comprehensive measures of inequality.

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