# Personal Holding Companies, Tax Progressivity, and Inequality*

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**Abstract**

Tax avoidance through personal holding companies has long been viewed as a key challenge for progressive income taxation. We exploit twenty years of administrative micro-data linking firms to owners in Sweden and Norway to analyze how the use of personal holding companies varies across the income distribution and to quantify its implications. About half of the income of the top 0.1% is paid to personal holding companies, defined—as in the US tax law—as firms for which five owners or less own more than 50% of the stock and that derive more than 60% of income from investment. Event-study results show that the creation of a holding leads to a fall of about 10 percentage points in individual income tax payments and a negligible increase in corporate tax payments, because most income paid to holdings is not subject to the corporate tax. Income tends to remain in holding companies, with cumulated payout rates of about 20% over two decades for the highest income groups. Wealth taxes do not provide an effective backstop due to the low valuation (or exemption) of shares in private businesses, the main form of wealth at the top of the wealth distribution. As a result, effective tax rates all taxes included fall from about 50% in the middle of the income distribution to about 15%–20% among very high-net-worth individuals.

**Keywords:** tax avoidance, distributional tax analysis, inequality.
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# 1 Introduction

The progressive income tax is a key component of modern tax systems and a major determinant of the long-run evolution of income concentration. Ever since its inception, the use of personal holding companies has been understood as a major challenge for its very feasibility. In the 1930s, the U.S. Senate held a series of hearings during which J.P. Morgan, one of the largest American fortunes of the time, disclosed that he avoided paying income tax in 1931 and 1932 by retaining investment income in holding structures. This prompted the U.S. government to pass the Personal Holding Company tax in 1937, subjecting the undistributed income of personal holding companies to a 20% surtax. Concerns about the use of personal holding companies extend beyond the United States and have been a recurring feature of global tax debates since the beginning of the 20th century.

Yet despite the importance of this concern, relatively little is known about how frequent the use of personal holding companies is, how it has evolved over time, and what its economic implications are. This lack of evidence stems from two difficulties. First, studying this issue requires data rarely available to researchers, namely micro-data linking individuals to the different holding structures they own. Moreover, holding chains can be complex, involving several intermediate structures in different countries (sometimes with a great deal of secrecy), further complicating empirical analysis.

This paper breaks new ground in this area by offering a forensic analysis of the use of personal holding structures in two countries with linked administrative micro-data covering a long period of time, Norway and Sweden. These data allow us to quantify the prevalence of the use of holding structures across the income distribution, changes in the use of such structures over time, the role of policies in shaping decisions to use holding companies, and the implications of this form of tax avoidance for tax progressivity and inequality.

Our main findings can be summarized as follows. First, we document a widespread use of personal holding companies at the top of the income distribution: about 50%–60% of income earned by the top 0.1% is earned through such structures in both Norway and Sweden. Income tends to remain in holding companies, with cumulated payout rates of about 20% over two decades for the highest income groups.

Second, the creation of personal holding structures translates into a collapse in effective tax rates: personal income tax saving vastly exceed any extra corporate tax liability, which is typically close to zero since dividends and capital gains earned by holding companies are essentially tax exempt. As a result, effective tax rates all taxes included fall from about 50% in

the middle of the income distribution to about 15%–20% among very high-net-worth individuals.

Third, we uncover a growing use of holding companies over time: the use of holding companies rose after the implementation of rules extending the tax exemption of intra-group dividends in Sweden and increasing personal dividend taxation in Norway. As a result, there is a growing wedge between "taxable income" and "economic income" inequality measures. Accounting for income paid to personal holding companies erases half of the difference in the 1980–2020 rise of the top 1% fiscal income share between Scandinavian countries and the United States, whereas rules penalizing the use of holdings have been in place since the 1930s.

Fourth, we find that traditional wealth taxes offer limited backstop. In both Sweden and Norway, wealth tax rates are bell shaped and fall to less than 1% of economic income at the very top of the wealth distribution. In Sweden, shares in privately-held companies were exempt from the wealth tax. In Norway these shares benefit from advantageous valuation rules, in effect well below market value. Because most of the wealth at the top of the distribution corresponds to shares in private businesses, these valuation rules have first-order effects on effective wealth tax rates at the top. We design an algorithm to value stakes in private firms at their market values and show that a wealth tax based on such market values would serve as an effective backstop to the income tax.

Overall, our results illustrate how the progressive income tax often remains a mere consumption tax for ultra-high-net-worth individuals. One century after its creation it remains an incomplete achievement. We discuss the external validity of these findings by connecting our results to an emerging body of work on patterns in tax progressivity at the top of the distribution in various countries.

The rest of this paper proceeds as follows. We relate our work to the literature in Section 2. Section 3 describes our data and methodology. Section 4 studies the role of holding companies and presents our event-study results. Section 5 analyzes the role of the wealth tax as a backstop. Section 6 presents our results on the progressivity of the tax systems of Norway and Sweden. Section 7 presents the implications of our results for time-series and international comparisons of inequality.

# 2 Related Literature

## 2.1 Distributional Tax Analysis

Our paper first contributes to the burgeoning literature using linked firm-owner data to study effective tax rates across the distribution all the way up to ultra-high-net-worth individuals.

Bruil et al. (2025) in the Netherlands, Bach et al. (2025) in France, and Balkir et al. (2025) in the United States find that, all taxes included, ultra-high-net-worth individuals tend to have relatively low tax rates.[1] In these three countries, the effective personal income tax rate falls sharply at the top of the distribution. This decline is partly offset by an increase in corporate income tax paid, but the decline in the personal income tax dominates.

Our main contribution relative to this burgeoning literature is to uncover, quantify, and analyze the role of personal wealth-holding companies in explaining the decline in tax progressivity at the top end. We propose a method to identify holding companies in administrative data and use a variety of research designs to study the causal effects of holding companies on reported income and tax payments. The use of personal holding companies turns out to be prevalent at the top of the distribution and a key reason for the decline in effective tax rates. We also study changes over 20 years leveraging the richness of Norway's and Sweden's administrative data.[2] This allows us to study how policies shape this form of tax avoidance.

## 2.2 Income Shifting

We also contribute to the literature on income shifting between the personal and the corporate income tax base. It is well understood (see, e.g., Slemrod, 1995) that when the corporate tax rate is lower than the top marginal individual income tax rate, there can be incentives to avoid taxes on wages and business income by reporting income as corporate rather than individual income.[3] Self-employed individuals and certain employees can incorporate. Businesses can opt for organizational forms subject to the corporate tax rather than to the individual income tax. A body of work studies these forms of income shifting and policies to mitigate it, including in Scandinavian countries where the adoption of dual income tax system in the 1990s increased incentives to shift to the corporate base (see, e.g., Selin and Simula, 2020; Pirtitilä and Selin, 2011; Alstadsæter and Jacob, 2016; Tazhitdinova, 2020).

[1] See Zucman (2024) for a summary of these studies. This body of work builds on an earlier literature studying tax progressivity following the founding work of Colm and Tarasov (1942) and Musgrave et al. (1951) which typically did not mobilize linked firm-owner data. Recent studies in that tradition include Atria and Otero (2021) in Latin America; Guzzardi et al. (2022) in Italy; Landais et al. (2011) in France; Advani et al. (2023) in the UK; Saez and Zucman (2019) and Leiserson and Yagan (2021) in the United States.

[2] Both Bruil et al. (2025) and Bach et al. (2025) have linked firm-owner data for one year, 2016. Balkir et al. (2025) have linked firm-owner data for 2019.

[3] In practice incentives to shift depend on other factors, e.g., the dividend tax rate, the capital gains tax rate, and rules regarding basis step-up at death. For very high-income individuals who chose to incorporate and can afford to save virtually all their income, the dividend tax rate is irrelevant. If there is a step up of basis at death (as in the United States and France), the capital gains tax rate is irrelevant too, as the capital gains tax liability caused by the accumulation of retained earnings in companies is erased when companies are transferred to heirs. In that case, shifting from the personal to the corporate tax base is advantageous as long as the corporate rate is lower than the top marginal individual income tax rate.

Our contribution to this literature is to focus on another form of shifting which has received less attention so far: the use of personal holding companies to avoid taxes on capital income. It turns out that this shifting is key at the top of the income distribution and quite different in nature than other forms of shifting. Because a lot of the income earned by holding companies is not subject to the corporate tax, the corporate tax rate is not a main determinant of it.[4] In principle, this makes this shifting broadly advantageous. In practice it faces some constraints. It is limited by general anti-abuse provisions that can invalidate structures created with the sole purpose of avoiding taxes. Moreover, some investment income earned by holding companies can remain subject to the corporate tax. All of this makes the prevalence of this form of shifting across the income distribution an open empirical question.

## 2.3 Wealth Taxation

Next, we also contribute to the literature analyzing the historical and international experience with individual wealth taxation (e.g., Jakobsen et al., 2020; Ring, 2025; Ring and Thoresen, 2025; Saez and Seim, 2025; Londoño-Vélez and Ávila-Mahecha, 2025; Jakobsen et al., 2025). Our main contribution to this body of work is to clarify whether wealth taxation has been effective at playing the role of "backstop" for the income tax at the top end of the distribution, which has motivated the implementation of wealth taxes historically (e.g., Shoup et al., 1949). We show that in both Norway and Sweden there is a large gap between the value of wealth that was used for the purpose of wealth taxation and the market value of wealth. This gap leads to a large decline in effective wealth tax rates at the top of the distribution. We attempt to draw lessons from these experiences for the future. In particular we show how one can construct estimates of the market value of wealth using already available administrative information from business income statements and share registries. Our valuation model allows us to contrast taxable vs. market wealth across the distribution.

## 2.4 Measurement and Comparison of Inequality Across Countries

Last we add to the literature on the measurement of inequality over time and across countries. A classic issue in this literature is how to account for corporate retained earnings. Alstadsæter et al. (2025) and Aaberge et al. (2025) leverage the detailed administrative data of Norway to quantify the importance of retained earnings at the top of the distribution and draw lessons

[4] In Norway, dividends and capital gains originating from corporations in the European Economic Area (EEA) are tax exempt. Non-EEA dividends and capital gains are exempt if they come from large ($> 10\%$) ownership shares. Interest (and similar, e.g., money-market fund) income is not tax exempt. In Sweden, the dividends and capital gains exemption applies only for large shareholdings.

for the measurement of inequality in other countries, such as the United States (see the debate between Piketty et al., 2018, 2024 and Auten and Splinter, 2024).

Our contribution to this line of work is to quantify the role of the different treatment of holding companies in Europe vs. the United States to the differential evolution of observed inequality (Blanchet et al., 2022). In the United States, stronger anti-abuse rules prevent the use of personal holding companies, while, as we show, their use has been on the rise in Norway and Sweden. Accounting for this erases a significant part of the difference between the rise of inequality in Scandinavia and in the United States.

# 3 Data and Methodology

We are interested in measuring the income retained by households in companies, and in particular how much income is retained in personal holding companies. We start by explaining how we link corporations to households in both Norway and Sweden. We then discuss how we identify personal holding companies, and how we define and measure income at the individual level.

## 3.1 Linking Firms to Owners

**Norway.** To link firms to owners, we use the Norwegian share register maintained by Statistics Norway, which has been exploited successfully in previous research (Berglann et al., 2011; Thoresen et al., 2012; Alstadsæter et al., 2025; Aaberge et al., 2025). We extend this earlier work by using consolidated accounting statements. This allows us to avoid any double counting issue, and to capture foreign profit. For example, a Norwegian company A may own a subsidiary in country B. With the unconsolidated statements used in previous work, only the profits made in Norway are included. But with consolidated statements, profits made abroad by 50%-owned subsidiaries (net of those accruing to the minority shareholders) are included in the analysis. This is important in small open economies like Sweden and Norway where a sizable fraction of wealth owned at the very top can be owned abroad.

**Sweden.** In contrast to Norway, Sweden does not maintain a comprehensive share register. However, it is possible to link businesses to owners fairly accurately by using tax forms issued when dividends are distributed, as successfully done in previous work (Bach, Calvet and Sodini, 2020; Jakobsen et al., 2024). We extend this work by using new data sources which allow us to capture links when no dividends are distributed. Specifically, we use four different data sources.

First, we collect information on shares held in unlisted firms from the so-called K10 tax

returns. Owners of closely held businesses file the K10 return annually and the statements determine how compensation to owners gets taxed.[5] We retrieve the universe of K10 returns during 2000-2020. These records include information on the active individual Swedish owners with links to firm identifiers.

Second, we collect the K31 returns during 2000-2020. These returns are filed annually for each firm and owner in listed firms and include dividends paid to the individual. They determine the dividend component from listed companies in capital income taxes due. For the 2000-2007 period when Sweden taxed wealth, these records also include information on shares held.

Third, we match the K10 and K31 returns to the Serrano Database, a longitudinal database with financial history of Swedish companies, provided to us by the Data Center of the Swedish House of Finance. In particular, the Serrano database retrieves information on financial statements as well as on ownership structures from the Companies Registration Office (Bolagsverket). We use data from the tax returns and Serrano to determine ownership shares as follows.

For listed firms that pay dividends, we simply divide the total dividends received in K31 by the total dividend payments recorded in Serrano. We follow the imputation methods of Bach et al. (2020) to determine ownership for years when dividends are not paid out. Shares in unlisted firms are deductible from the K10 returns together with information on the aggregate outstanding shares. We obtain the latter from Serrano.

Fourth, we complement the above strategy for determining ownership in unlisted and listed firms using a database called Holdings, provided by a private company called Modular Finance. Holdings provides snapshots of ownership in firms in different points in time. We retrieve the firm identifier, the names of the listed owners, and their shares. In some instances, we observe the owners' direct and indirect stakes in the company, separately. These data exist primarily for larger firms.

These steps deliver a dataset of ownership in listed and unlisted firms. When allocating retained earnings within the company to owners, one potential complication is that owners may hold shares in companies indirectly through holding companies. Fortunately, the Serrano database reports financial statements in a consolidated manner, where all the financial activities of subsidiaries have been aggregated to the parent-company level. This means that we do not need to construct the network of ownership structures across firms.

We start from the consolidated accounts and allocate retained earnings within companies

[5]There is a limit to how much compensation the owners can get via dividends that are taxed at the preferential dividend tax rate. This limit is determined by the so-called 3:12 rules and depends, among other things, on past wage payments to owners.

as follows. Our main measure of economic profit at the firm level is the profit or losses after net financial income have been recognized. From this income measure we subtract non-taxable operating income, typically derived from investment income in other companies. We subtract dividends paid to avoid double counting as they are included in the fiscal income of the individual. For ownership in holding companies, we additionally subtract profits or losses from participation in group companies. The resulting measure of firm income is then allocated to owners according to the shares calculated as described above.

## 3.2 Definition and Identification of Holding Companies

We define personal holding companies as firms majority-owned, directly or indirectly, by 5 or fewer individuals and for which 60% of income or more is investment income (dividends, interest, capital gains, rents).[6] This is the definition used in the US tax law for the enforcement of personal holding company tax, a 20% tax on the undistributed income earned by the holding. To reduce noise, in our baseline definition we classify as personal holding companies in year $t$ the firms that meet these criteria for three years in a row onward, i.e., in $t$, $t+1$, and $t+2$.

In Appendix results, we also consider a number of alternative definitions. First we implement a strict US definition where we classify as holding companies in year $t$ all the firms that satisfy the above criteria in year $t$. Second, for robustness we also consider a definition that does not rely on the identification of beneficial owners, namely firms classified in the holding company sector, that employ less than 5 employees, and for which 60% of income or more is investment income.

## 3.3 Definition and Measurement of Economic Income

Our baseline measure of income is economic income, defined as fiscal income (i.e., income as reported by individuals in their income tax return), plus employer payroll taxes, corporate retained earnings, and corporate taxes paid. This allows us to consider a comprehensive measure of market income which is much larger than fiscal income at the top of the distribution, and yet fully based on micro-data.

**Fiscal income.** We start with fiscal income as reported in tax returns, to which we add employer payroll taxes. Fiscal income includes realized capital gains. A potential concern is that adding corporate retained earnings (as we do in the second step below) leads to some double-counting, since part of realized capital gains reflect the accumulation of retained earnings

[6] Holdings are defined using unconsolidated financial statements.

within firms. In practice, this concern is of very limited empirical relevance in Sweden in Norway due to the specific features of capital gains taxation in these countries. In Sweden, losses must be used in the year where they are realized; carryforwards are not possible.[7] As a result the net flow of realized capital gains on corporate equity is small. Most realized capital gains reflect real estate capital gains. In robustness series, we show that our findings are robust to fully excluding capital gains from income.[8]

**Retained earnings and corporate tax.** In a second step, we add micro-level retained earnings and corporate tax obtained after linking firms to owners (as detailed above). Here we present the main methodological principles and conceptual issues; Appendix B and C provide country-specific details for Sweden and Norway respectively. We follow the same general principles in both Sweden and Norway: (i) retained earnings are computed using consolidated financial statements, (ii) we include all firms whether more than 10 or less than 10% owned (and provide robustness analysis where we restrict to 10%-owned only firms; this makes no difference).

Specifically, we first define profits as consolidated worldwide profit, net of interest paid, corporate tax paid, depreciation, and minority interest. Retained earnings equal profits minus dividends distributed. We allocate retained earnings to individuals using the ownership stakes constructed in Section 3.1.

Second, we allocate corporate taxes as we do for retained earnings. It is helpful to think of our allocation of the corporate tax as capturing the amount of individual income tax that shareholders would pay if all corporations were transparent for tax purposes (i.e., taxed as "pass-through" entities). The main advantage of our measure of income is that it it is neutral with respect to business organizational forms and to changes in the tax law, thus facilitating comparisons over time and across countries. This is also the methodology followed by Bach et al. (2025) in France.

Figure 1 shows the amount of retained earnings allocated to households, expressed as a fraction of economic income. In both Sweden and Norway this has been on a rising trend since the beginning of the 21st century, from very low amounts 2000-02 (in the context of the dot-com recession which largely erased corporate profits) to about 10% of economic income in 2020. As

[7]Losses up to 150,000 SEK provide an income tax credit of 30% (mirroring the 30% tax rate on capital income). Only 70% of realized losses in excess of 150,000 SEK are creditable.

[8]In the Swedish and Norwegian context, including realized capital gains in the benchmark income measure seems desirable since people realizing gains (e.g., selling a house) would otherwise have misleadingly high effective tax rates.

already shown by Alstadsæter et al. (2025) and Aaberge et al. (2025) there is a sharp rise in retained earnings in Norway following the introduction of a dividend tax in 2005. In Sweden the increase is more gradual.[9]

# 4 Holding Companies Across the Distribution

## 4.1 The Importance of Holding Companies

We start the analysis in Figure 2 by showing the fraction of economic income that corresponds to undistributed corporate earnings (gross of corporate income taxes) by income group in both Sweden (panel a) and Norway (panel b). A number of results are worth noting. First, in both cases this fraction converges to nearly 100% at the top of the distribution. In other words for the top economic income groups, fiscal income amounts to only about 0%–5% of economic income.

Second, most undistributed earnings are in personal holding companies. In both Sweden and Norway, about 50%–60% of income is earned and retained in such personal holding companies. The rest is essentially earned in other controlled businesses, whether they are 100% owned (but do not satisfy the definition), 50% owned or 10% owned. Retained earnings in businesses that are less than 10%-owned are marginal. Figure 3 shows the rise in the fraction of economic income earned through holding companies by top-income groups over time.

## 4.2 Effects of Creating a Holding Company

Figure 4 investigates how individuals' tax outcomes evolve around the time they first come to own a holding company. At the firm level and as previously, a company is classified as a holding company if more than 60% of its revenue comes from financial sources and if a small group of owners (five or less) holds a majority stake; to ensure this reflects a persistent status rather than a temporary fluctuation, the firm must satisfy these criteria for three consecutive years, after which it is treated as a holding company going forward. The event is defined at the individual level as the first year in which a person owns such a company, and time in the graphs is measured relative to this year, with event year 0 marking the first year of ownership, negative values indicating years before, and positive values years after. The sample is restricted to individuals observed continuously from two years before to five years after this event, and all estimates are expressed relative to the year just before the event (event year -1). The graphs

[9] Appendix Figure A1 shows the amount of retained earnings allocated to other institutional sectors (government, foreign owners). As shown in Figure A2 in the case of Norway we can allocate virtually all retained earnings to their ultimate beneficiaries; the amount of unallocable income is marginal.

then show how effective tax rates–overall as well as separately for income and corporate taxes–change around this transition, allowing a comparison of pre-trends and post-event dynamics while accounting for differences across cohorts that begin in different calendar years.

A number of results are worth noting. First, as shown in panel (a), effective tax rates collapse after the creation of a holding. Effective tax rates are equal to the sum of personal taxes (individual income tax and payroll tax) and allocated corporate taxes, expressed as a fraction of economic income. There is a 9 percentage point drop in the effective tax rate after the creation of a personal holding company. Second, as shown in panel (b), this drop comes mainly from the fact that economic income surges at the time and right after the creation of the holding, while total taxes slightly decline. This points to the fact that holding companies are often created when firms start making profits or before the realization of capital gains ("anticipation channel").

Third, as shown in panel (c), some of the drop in the effective tax rate comes from a drop in reported fiscal income. This points to the fact that some income that was previously subject to the personal income tax (e.g., dividends from listed shares) is shifted to the holding. Indeed we can see that all the decline in fiscal income comes from a fall in reported dividends; other fiscal income is flat. Last, as shown by panel (d) the decline in personal dividends is small relative to the upsurge in financial income received by the holding. This suggests that the pure income shifting channel is relatively small compared to the anticipation channel.

Overall, these event studies suggest that people who are on the verge of becoming rich from a fiscal income perspective successfully manage to avoid having to report high fiscal income through the creation of a holding company. As we shall see in Section 7 below, this has important implications for the measurement of inequality: fiscal income "misses" many "newly rich" individuals.

## 4.3 Is Income Eventually Taxed?

A natural question is whether fiscal income eventually captures those newly rich individuals, in other words whether income ends up being distributed by the holding to its owner and subject to taxation. To investigate this issue, Figure 5 reports cumulated payout rates by income groups. Specifically, we rank individuals by their economic income in 2002 and for each year $t$, compute the ratio of the cumulated dividends and realized capital gains reported (in individual income tax returns) between 2002 and $t$, to the cumulated apportioned corporate profits earned by these individuals between 2002 and $t$.

A number of results emerge. First, cumulated payout rates are low at the top of the distri-

bution. Even 18 years forward, in both Sweden and Norway only 15%–20% of corporate income is paid out as dividends or realized capital gains in the top income groups. Payout rates fall monotonically across the income distribution, from about 50%–60% for the 90th percentile down to 15%–20% for the top 0.0005%. Ultra-high-net-worth individuals can afford to retain most of their income in companies as their personal expenditures are small relative to their economic income.[10]

Second, the payout rate declines over time in Norway. This is due to the creation of holding companies following the 2005 dividend tax reform.

# 5 Progressive Wealth Taxation: An Effective Backstop?

## 5.1 Effective Wealth Tax Rates

A standard argument for progressive wealth taxation is that it serves as a backstop for the individual income tax (e.g., Shoup et al., 1949). Norway has a wealth tax and Sweden used to have a wealth tax before 2007, making it possible to investigate this argument empirically: does the wealth tax offset the individual income tax avoidance permitted by holding companies?

To shed light on this issue, Figure 6 shows effective wealth tax rates by income group. In both Sweden and Norway, wealth tax rates are bell shaped and fall to less than 1% of economic income at the very top of the wealth distribution. In Sweden, shares in privately-held companies were exempt from the wealth tax. In Norway these shares benefit from advantageous valuation rules, in effect well below market value. As shown in the bottom panel of Figure A4 most of the wealth at the top of the distribution corresponds to shares in private businesses and hence these valuation rules have first-order effects on effective wealth tax rates at the top.

## 5.2 Counterfactual Wealth Tax Rates

To quantify the role of wealth valuation rules, Figure 6 shows counterfactual effective wealth tax rates where we use our data to compute estimates of the market values of top-owned private businesses.

Specifically, we use data on listed firms in the four nordic countries from Compustat via WRDS to calculate enterprise-value to revenue and price to earnings multiples. We compute median multiples at the two-digit NACE (industry) code and year level and apply these to the

[10] In both Sweden and Norway there is a carryover of basis at death, hence heirs might be liable for capital gains taxes upon realization. Studying realization across several decades, including by heirs, is a fruitful avenue for future work.

firms in our sample. For industry-year cells where there are fewer than 10 observations in the Compustat data, we omit the multiples, and instead employ unconditional medians to the firms in these industry-year cells in our data. When applying the P/E multiple, we apply this to retained earnings in indirectly-held firms and to earnings (net income) in directly held firms to avoid valuing earnings that are distributed at dividends multiple times in an ownership chain. When applying the enterprise-value to revenue multiple, we subtract long-term debt and add financial assets to obtain an implied equity value.

The results show that if the wealth tax was based on such estimated market values, wealth tax payments would be an order of magnitude larger than observed. By contrast, ceiling rules (capping the amount of wealth tax liability at a fraction of fiscal income) play a much smaller role in the low observed effective wealth tax rates (bottom panels of Figure 6).

# 6 Implications for Tax Progressivity

What are the implications of the high amounts of retained earnings at the top of the income distribution? This Section analyzes the implications for tax progressivity, while the next focuses on the implications for the measurement of inequality. To study tax progressivity, we take a comprehensive perspective on taxation: we allocate all taxes to all individuals and all income.

**Distribution of taxes.** We allocate all taxes, at all levels of government. To do so we follow the methodology of distributional current-tax analysis in Saez and Zucman (2023). Labor taxes are allocated to the corresponding workers, consumption taxes to the corresponding consumers, and capital taxes to the corresponding asset owners. Specifically, and as previously, taxes on corporate profits are allocated to the individual owners of corporations,[11] taxes on the profits of unincorporated businesses to the owners of unincorporated businesses, residential property taxes to the owners of residential properties, business property taxes to the owners of business property, individual income taxes on dividends, interest, rents, capital gains, and royalties to the individuals who earn this income. This allocation follows standard economic analysis: labor taxes are the wedge between the pre-tax labor costs paid by employers and the net-of-tax compensation received by workers; capital taxes are the wedge between the pre-tax capital costs of producers and the net-of-tax capital income received by capital owners; and consumption taxes are the wedge between the post-tax prices paid by consumers and the pre-tax price received by sellers.

[11] We allocate the difference between macro corporate taxes (net of oil-related taxes in Norway) and allocated corporate tax proportionally to economic income.

**Distribution of income.** In this Section we take a more comprehensive measure of income than economic income used thus far. Specifically, for the computation of all-in effective tax rates and to rank households, we use pre-tax national income, as defined in the Distributional National Accounts literature (e.g., Piketty et al., 2018; Blanchet et al., 2021). Pre-tax income is equal to labor and capital income after the operation of the pension system and the unemployment insurance system. Pre-tax income removes contributions to pensions and to unemployment insurance and includes the corresponding benefits.

Pre-tax income is obtained as economic income plus the residual between national income and economic income, which we allocate proportionally to economic income. I.e., our income measure only reflects the distribution of economic income and is adjusted proportionally to match the total amount of national income, in a distributionally-neutral manner (i.e., proportionally to economic income). By construction this adjustment has no impact on distributions; it simply makes it possible to compare income levels over time and internationally. We show that all our results are robust to using comprehensive market income instead of pre-tax income, as well as to implementing a more granular allocation of residual income.

Because our analysis includes all taxes and all income, the effective tax rate across income groups averages to the macroeconomic rate of taxation, that is, the ratio of total tax to national income. This makes it possible to address questions such as: do wealthy people pay more or less tax, relative to their income, than the average taxpayer?

**Consumption taxes on transfer income.** VAT is key tax for the bottom 90%. Ideally we would compute VAT with individual data on consumption; however such data is not available even in Norway and Sweden. The next best approach involve calculating consumption using the budget-constraint approach (Koijen et al., 2014; Baker et al., 2022). This requires data on *active* saving. Pre-2007 Swedish data particularly good for this. Thus we estimate consumption rates with Swedish data, and apply consumption shares (as % comprehensive income) to Norwegian data as well; we then allocate VAT according to imputed consumption.

More specifically, the consumption imputation follows the procedure of Nekoei and Seim (2023). During 2000-2007, when Sweden taxed wealth, the tax returns include annual snapshots of the number of shares held in each financial security (e.g. stocks and funds). We use this information to measure annual changes in the shares held for each individual and financial security. We value that change using the midpoint of the security's beginning- and end-of-year price assuming that rebalancing occurs in the middle of the year. We then sum the changes across securities within individual to arrive at a measure of annual savings. Imputed

consumption is then the budget-constraint residual that subtracts annual savings from disposable income. After 2007 it is not possible to observe wealth anymore and we assume constant income-consumption profiles after 2007.

A classic issue with the computation of effective tax rates for low-earners involves consumption taxes paid on transfer income. Transfers (other than pension and unemployment insurance) are not included in pre-tax income but VAT paid on consumption out of transfer income are part of taxes paid. We address this issue by removing the portion of consumption taxes paid out of transfer income from the numerator of effective tax rates, as recommended by Saez and Zucman (2023, Appendix A.4). In effect, these taxes are viewed as reducing the value of transfers rather than as taxes.

## 6.1 All-in Effective Tax Rates

Figure 7 and Figure 8 show the all-in effective tax rate by income group in Sweden and Norway respectively. A number of striking results emerge.

First, in both Norway and Sweden, effective tax rates hover around about 50% throughout the distribution up until roughly the 99th percentile.[12] There is then a collapse in effective tax rates between P98 and P99.99, from 50% to about 15%–20%. This fall is due to the collapse of the income tax at the top, which itself is due to the very low payout rates (panel c). Second, this fall is only very partially offset by corporate tax. Third, as already shown above, the wealth tax fails to act as effective backstop.

In Panel d of Figure 7, we compare the actual average tax rate across the income distribution in Sweden to a smooth counterfactual tax schedule that extrapolates the trend observed below the top 1%. The maroon line shows the observed average tax rate by percentile group, while the navy line shows the predicted tax rate based on the cubic fit estimated using data below the top 1%. At lower and middle parts of the distribution, the two lines closely track each other by construction, but within the top 1%—especially at the very top—the actual tax rate falls below the extrapolated benchmark. The shaded area between the two lines highlights this gap and represents the extent of regressivity at the top: how much lower actual tax rates are relative to what would be expected if the pre-top-1% trend had continued. Aggregating this gap into revenue terms implies that total tax revenues from wealth, income, VAT, and corporate taxes combined would be about 9.09% higher if top tax rates followed the extrapolated schedule, making the figure a visual and quantitative illustration of the revenue consequences of declining

[12] In Norway, we include the guaranteed minimum pension as part of pretax income. This minimum pension is above p20 and is taxable but not subject to payroll tax, which explains the kink in the average tax rate at P20.

effective tax rates at the very top.

Figure 9 analyzes the dynamic of effective tax rates over time. In both Sweden and Norway we see a significant decline in effective tax rates over time.

### 6.2 Effective Tax Rates of Billionaires

Following Balkir et al. (2025), we estimate the taxes paid by the wealthiest households by matching "rich lists" to the corresponding households' administrative data, including their share of their businesses's retained earnings and corporate taxes. In Sweden, we use annual rankings compiled by the magazine Veckans Affärer (VA) between 1998 and 2016, and Forbes magazine data between 2017 and 2020. These lists vary in size: Veckans Affärer focuses on "krona billionaires" (roughly households with more than $100 million in wealth), while *Forbes* focuses on dollar billionaires. Only resident households are included in our analysis: billionaires who live outside of Sweden are disregarded. We consider the largest fractile of the population that we can consistently capture over the full 2000–2020 period, namely the top 0.00045% of the resident household distribution (22 households in 2020). At the end of the period, this corresponds to the population of resident dollar billionaires. At the beginning of the period, this corresponds to households with wealth above around $300 million. For simplicity we will call the top 0.00045% "billionaires."

Figure 10 reveals a number of striking findings. First, the effective tax rates of billionaires has declined over time. This is true whether we look at taxes paid as a fraction of pre-tax national income or as a fraction of wealth. In Sweden the all-in tax rate falls from about 30% of pre-tax income in the early 2000s to above 15% in 2020, due both to the decline of personal taxes (fall in the personal income tax, abolition of the wealth tax) and the decline in the effective corporate tax rate at the top. In 2020, the top 0.00045% paid the equivalent of 1% of their wealth in total taxes, of which 0.2% in personal taxes and 0.8% in corporate taxes. These results are in line with those obtained in other European countries, but Sweden appears to be the country where tax regressivity at the top is the most marked, due to the generally high level of taxation (with rates above 50% for the upper middle class) and particularly low effective tax rates for billionaires.

## 7 Implications for the Dynamics of Inequality

In this Section we return to our baseline concept of economic income, and contrast the distribution of economic income to that of fiscal income.

## 7.1 Dynamics of Top Income Shares

Panel a of Figure 11 shows that while fiscal income concentration has been relatively stable in Sweden since the turn of the 21st century, the concentration of economic income has increased markedly. The top 1% share of fiscal income has increased modestly from 6% in 2000 to 8% in 2023, but the top 1% share of economic income has increased from 8% to 17%, a level not very far from the one observed in the United States (21% among households, according the real time inequality series of Blanchet et al., 2023).

This disconnect between the dynamic of fiscal vs. economic income concentration is confirmed by panel b of Figure 11, where we look at the income of the top 0.00045% of the wealth distribution using our merged "rich list" data. The share of fiscal income earned by this group has flatlined at about 0.1% of total fiscal income. Meanwhile its share of economic income rose from 0.3% to nearly 1.5%.

## 7.2 Is Europe More Equal than the U.S.?

While on many metrics Sweden is more equal to the United States, when it comes to top-end wealth and income the differences are significantly narrower. Figure 12 focuses on billionaires. There has been a large rise in resident billionaire wealth, with multiplication of top .0002% wealth to GDP by factor of nearly 4 (same as in the US) since the early 2000s, from about 3%-4% of GDP to about 14%. The share of wealth owned by this group has been multiplied by a factor of nearly 2 from 1.8% to 3.4%. The level and rise of the Swedish top .0002% are overall quite similar to what we see in the US. The same conclusion holds true when considering a larger group, the top 0.001%, as shown in Figure 13.

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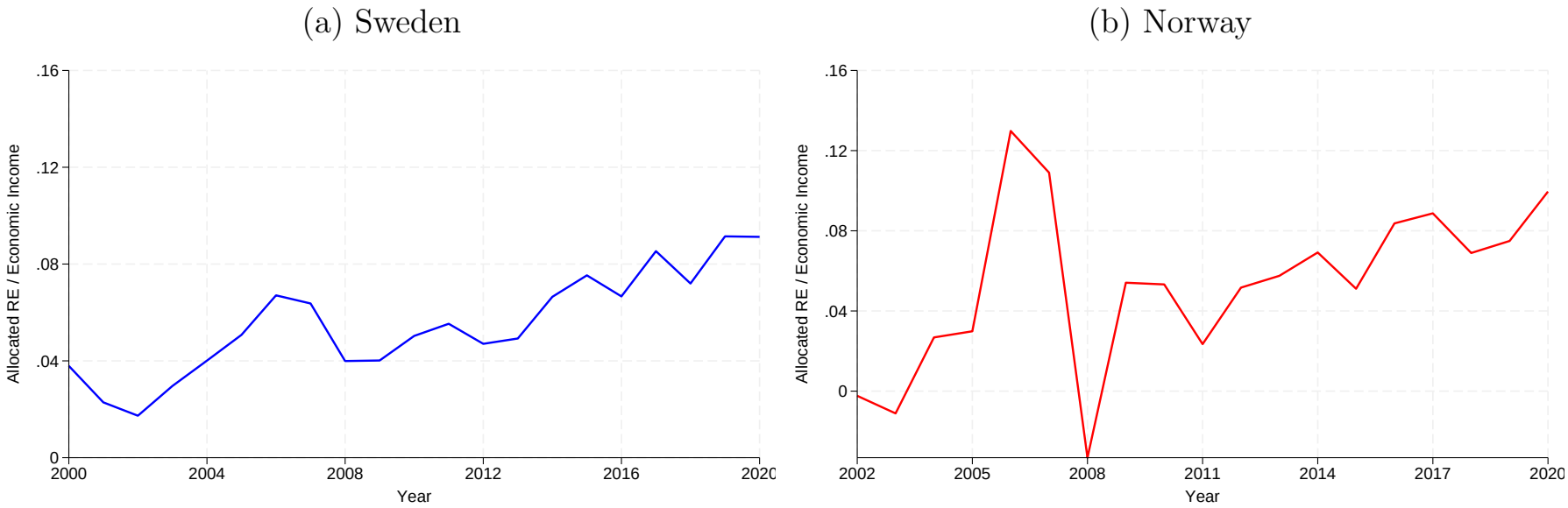
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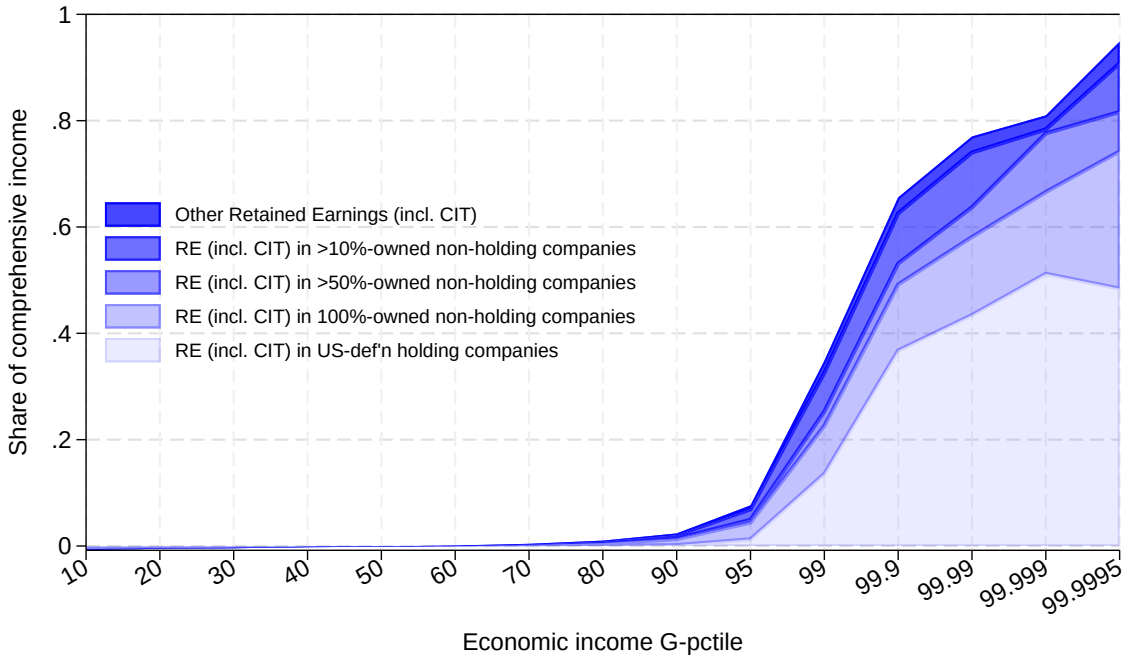
## Figure 1: Retained Earnings Allocated to Households (% of Economic Income)



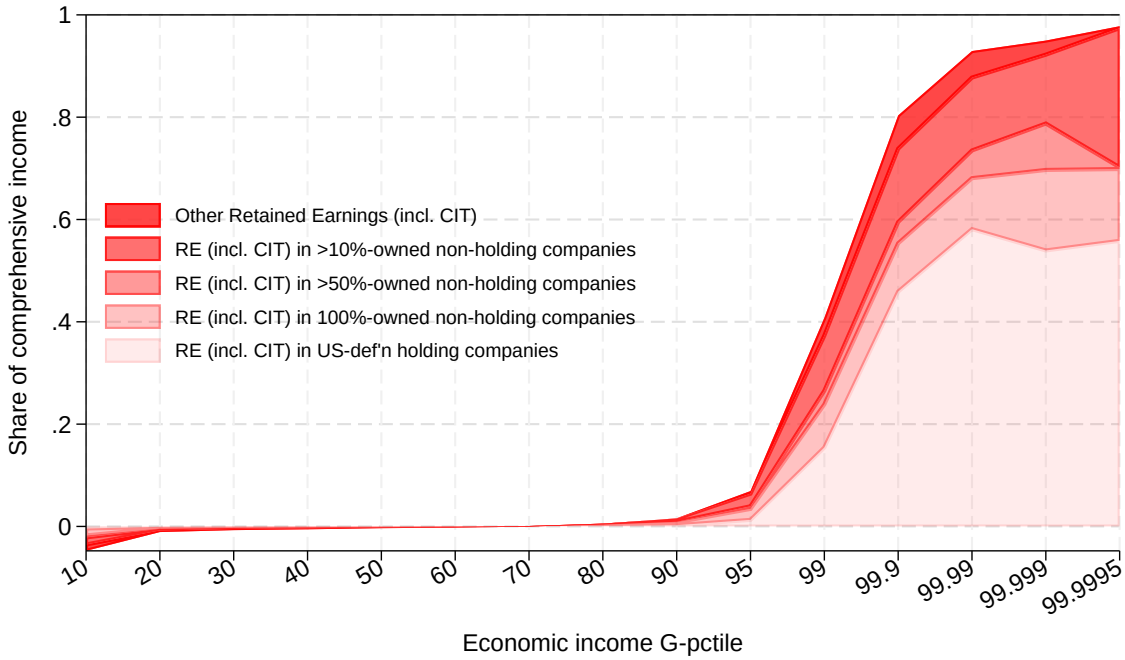

Notes: This figure plots the evolution of corporate retained earnings allocated to resident individuals in Sweden (panel a) and Norway (panel b). Retained earnings are expressed as a fraction of economic income, defined as fiscal income plus employer payroll taxes plus retained earnings plus allocated corporate taxes. Retained earnings are defined as profits net of capital depreciation, interest payments, corporate tax, dividend distributed, and minority interest. Retained earnings are apportioned to households based on their ownership stakes in the firms.

## Figure 2: Undistributed Income (% of Economic Income)

(a) Sweden



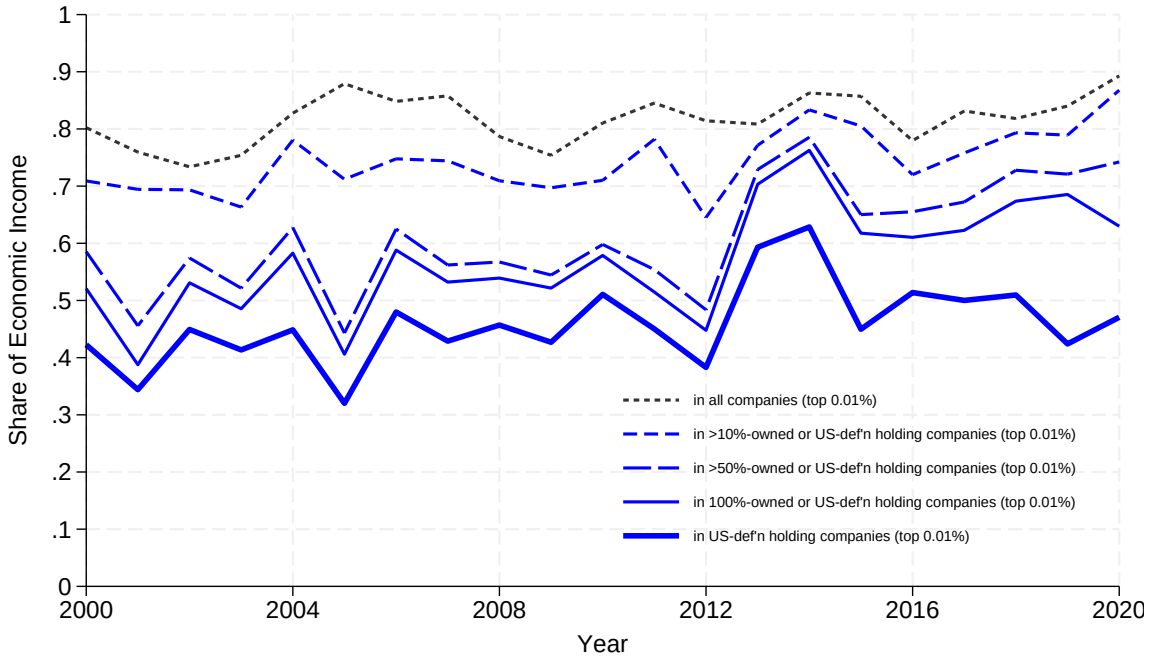

(b) Norway



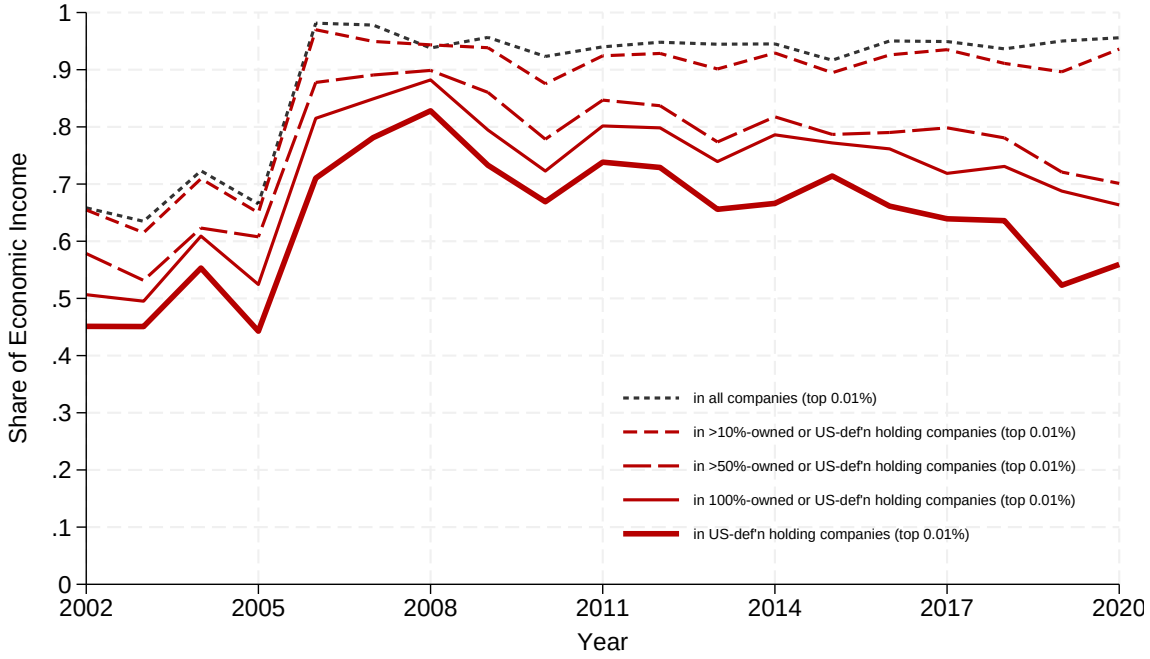

Notes: This figure shows the fraction of economic income which corresponds to undistributed earnings (gross of corporate taxes paid), by bins of economic income. We separately identify undistributed earnings in five non-overlapping categories of firms: (i) personal holding companies as defined in the US tax law (see text), (ii) firms 100%-owned other than holding companies, (iii) firms 50%-owned, (iv) firms 10% owned, (v) other firms.

## Figure 3: The Role of Holding Companies in the Top 0.01%

(a) Sweden



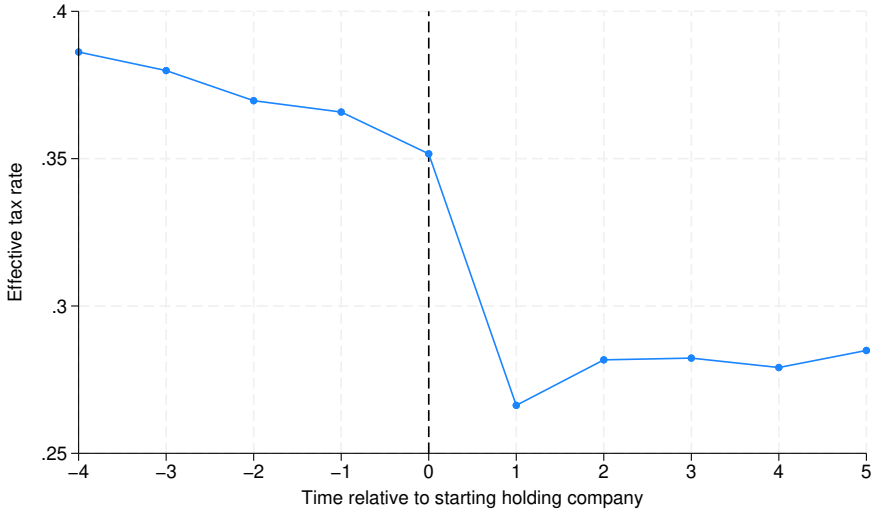

(b) Norway



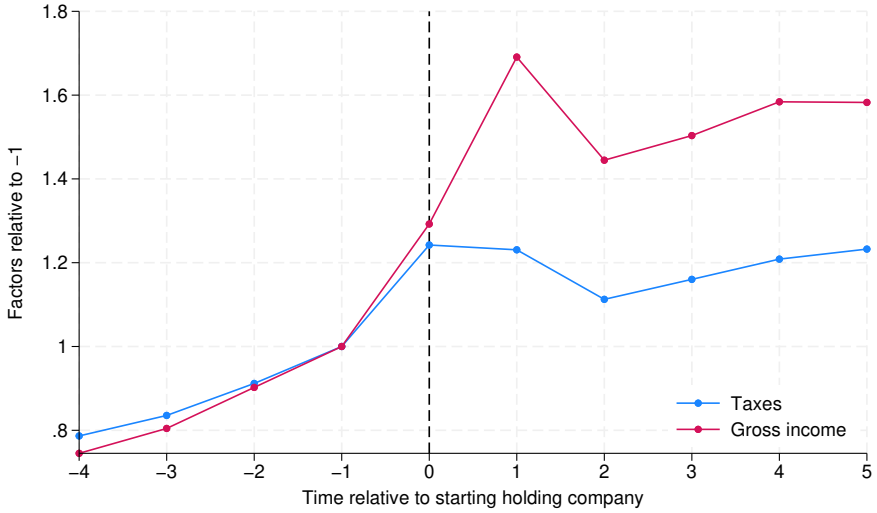

Notes: This figure shows the evolution of undistributed corporate income (gross of corporate taxes) earned by the top 0.01% of the economic income distribution in Sweden (panel a) and Norway (b). Undistributed profits are shown in five categories of firms: (i) personal holding companies as defined in the US tax law (see text), (ii) firms 100%-owned and personal holding companies, (iii) firms more than 50%-owned, (iv) firms more than10% owned, (v) all companies.

## Figure 4: Effects of Creating a Holding Company

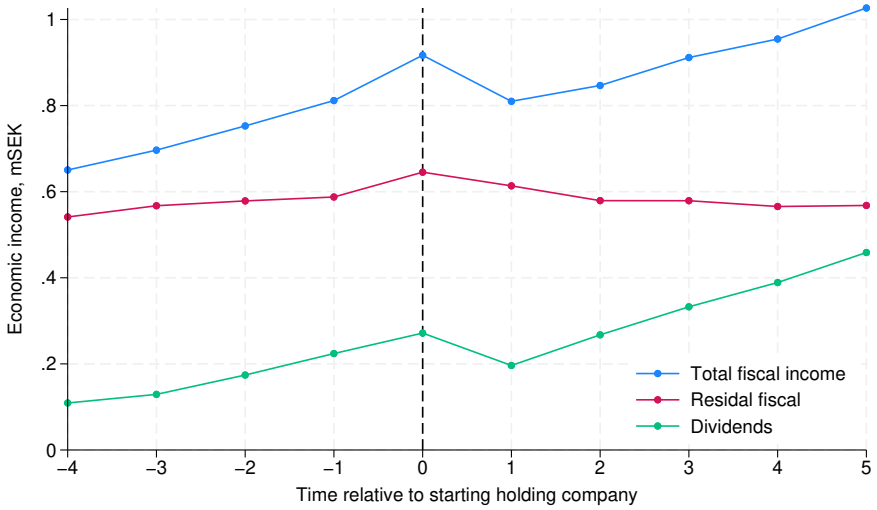
(a) Effective tax rates



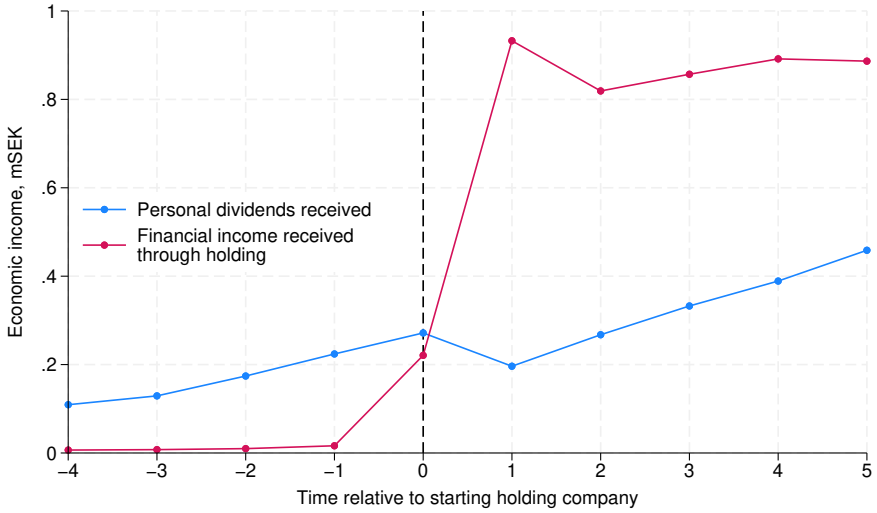

(b) Economic income and taxes




(c) Fiscal income



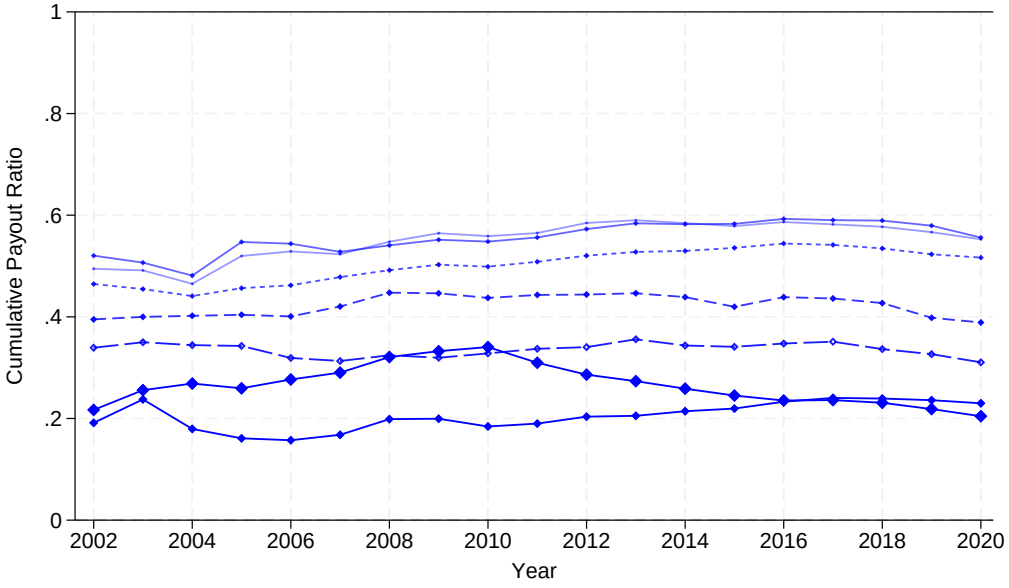

(d) Dividends



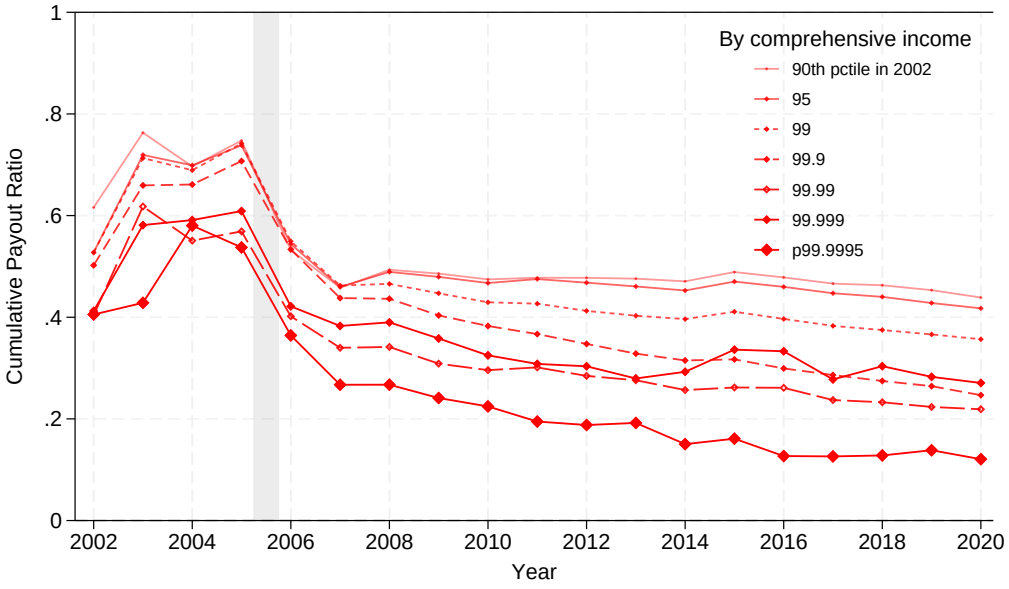

Notes: See text.

## Figure 5: Heterogeneity in Payout Rates Over Time

(a) Sweden




(b) Norway

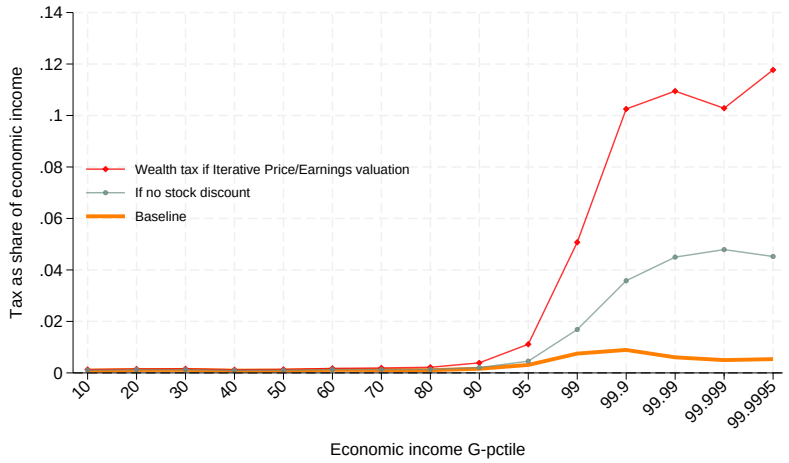



Notes: The cumulative payout ratio is defined as the ratio of the cumulated dividends and realized capital gains reported (in individual income tax returns) between 2002 and year $t$, to the cumulated apportioned corporate profits earned between 2002 and $t$. Households are ranked by their 2002 economic income. .

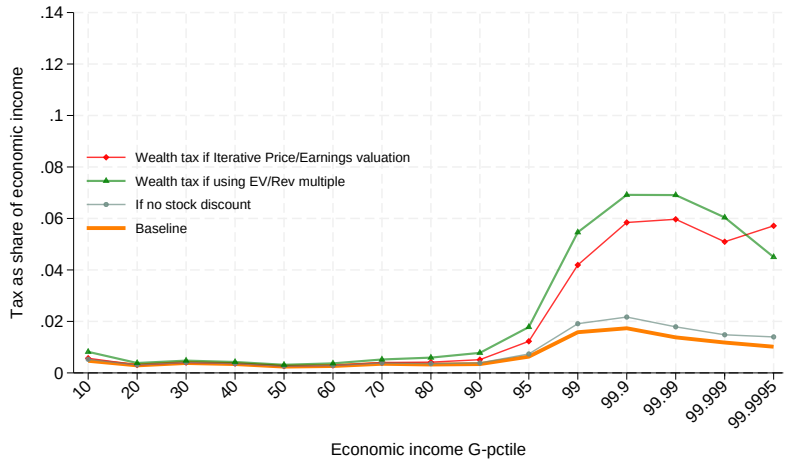
## Figure 6: Observed and Counterfactual Wealth Tax Rates

### Actual Wealth Tax vs. Market Valuation Counterfactuals

(a) Sweden, 2004–2006

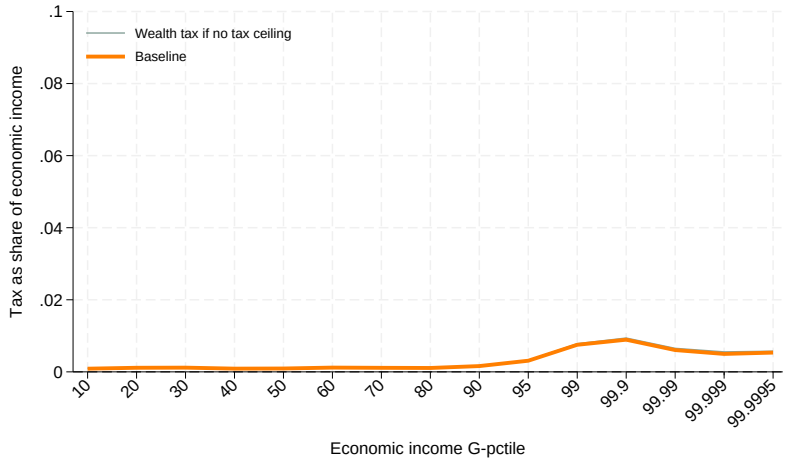



(b) Norway, 2018–2020

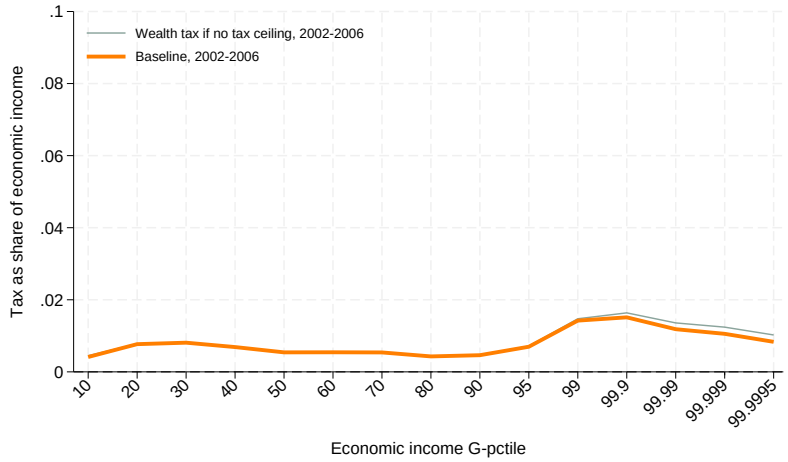



### Actual Wealth Tax vs. Removing the Ceiling

(c) Sweden, 2004–2006



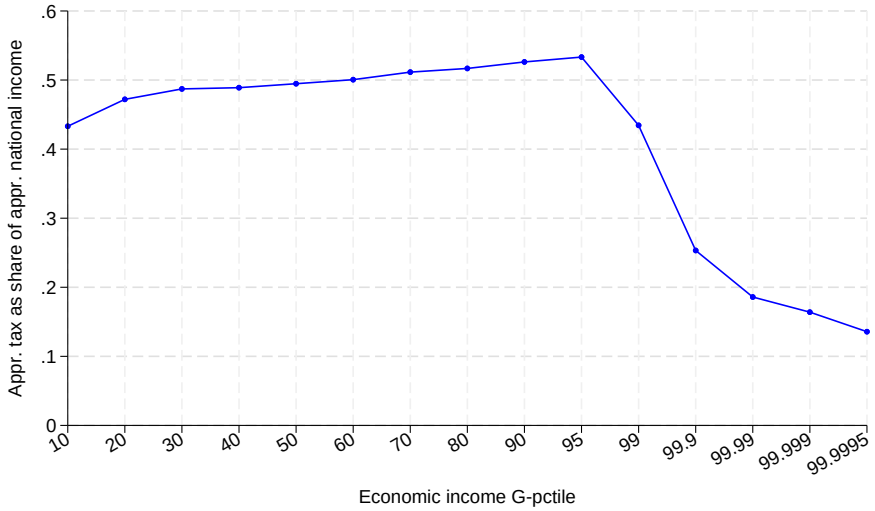

(d) Norway, 2018–2020



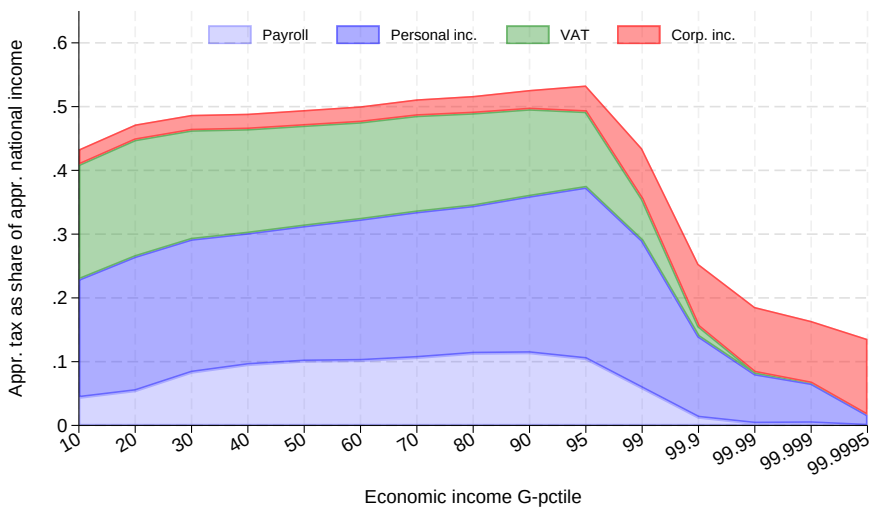

Notes: See text.

## Figure 7: Effective Tax Rates by Income Groups: Sweden

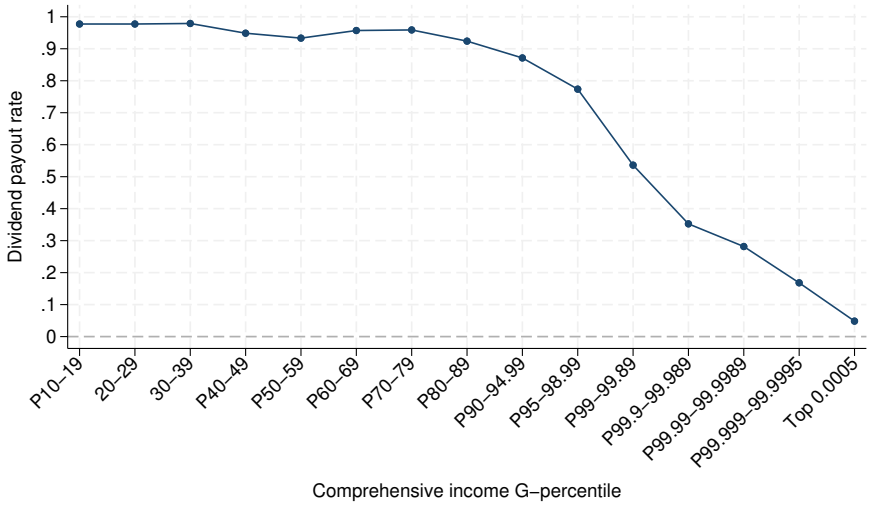
(a) All-in rate (2018–2020)



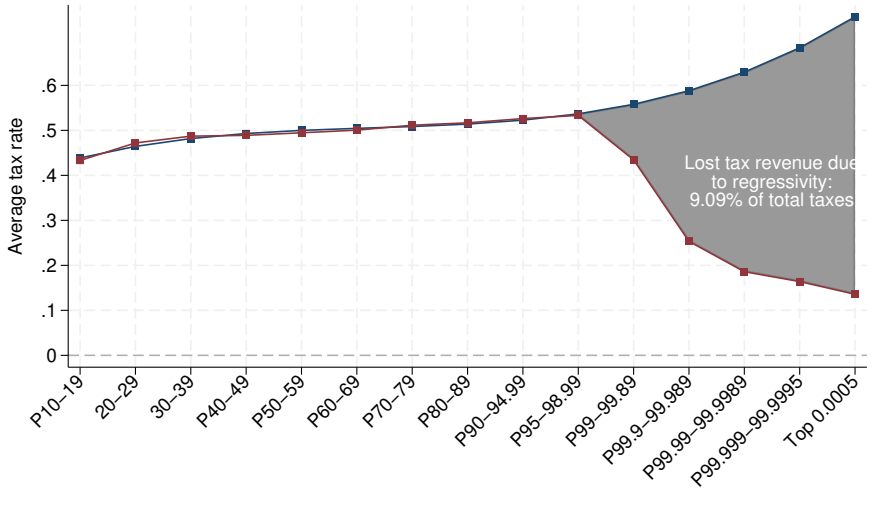

(b) Composition




(c) Dividend pay-out rate




(d) Counterfactual all-in rate



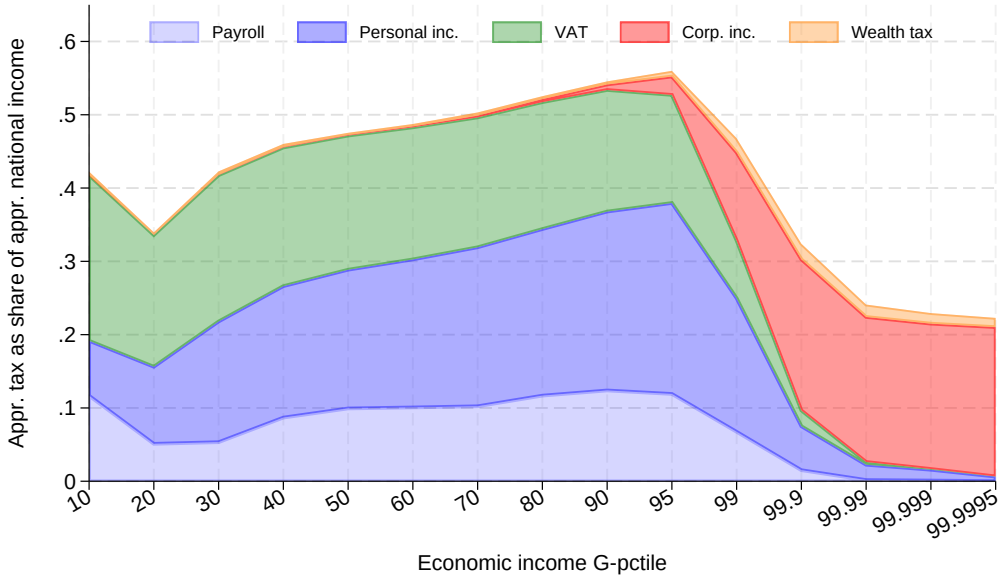

Notes: See text.

## Figure 8: Effective Tax Rates by Income Groups: Norway

(a) All-in rate




(b) Composition

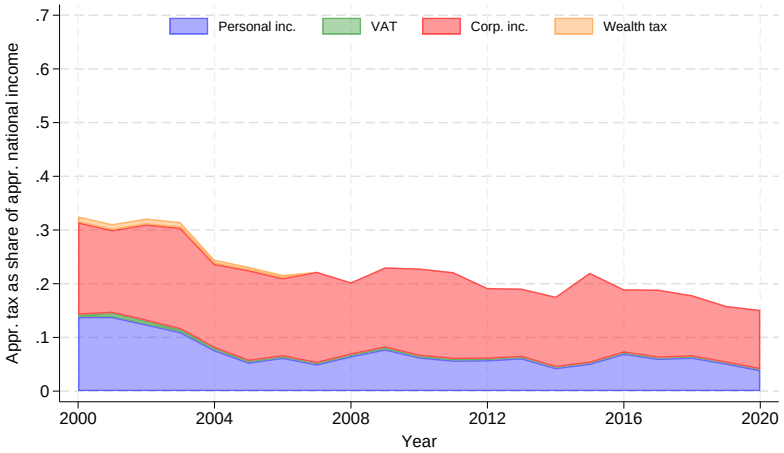



Notes: see text.

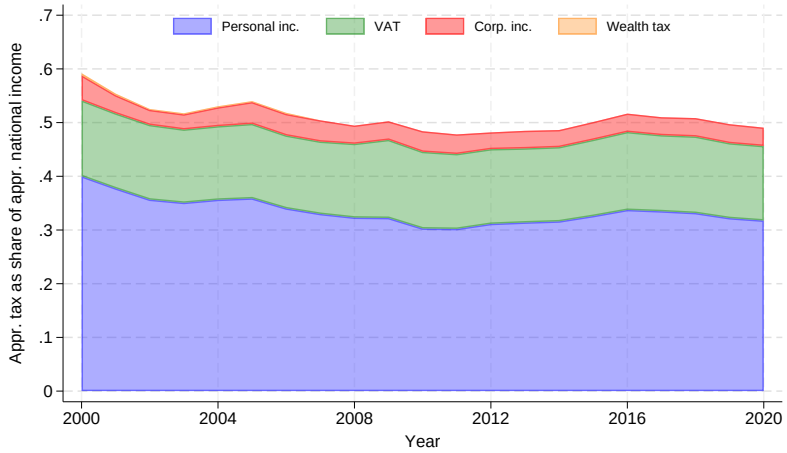
## Figure 9: Effective Tax Rates Over Time

### Sweden

(a) Top 0.01%

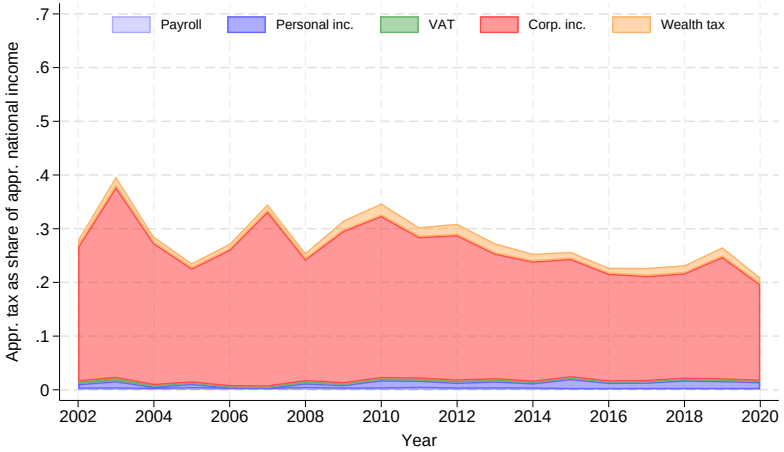



(b) Bottom 99.99%

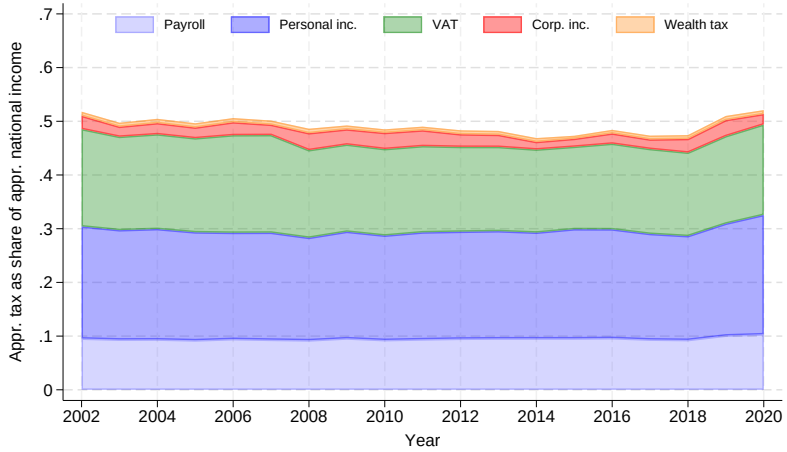



### Norway

(c) Top 0.01%




(d) Bottom 99.99%

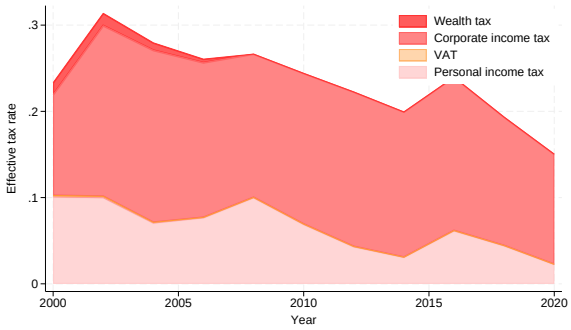



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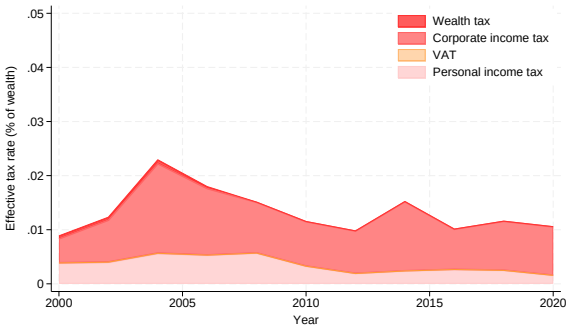
# Figure 10: Effective Tax Rates of Billionaires

## Sweden (top 0.00045%)

(a) % of Income

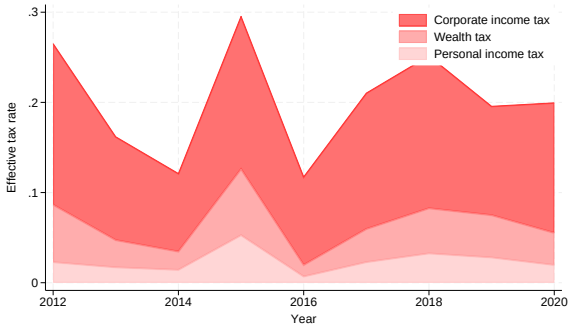



(b) % of Wealth

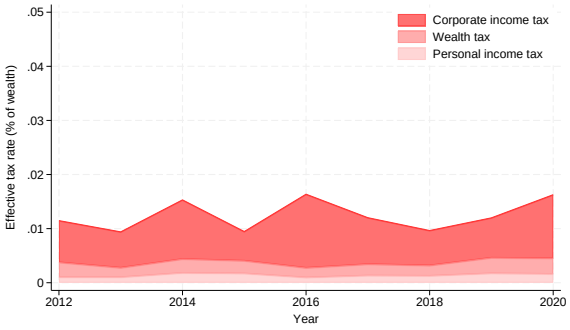



## Norway

(c) % of Income



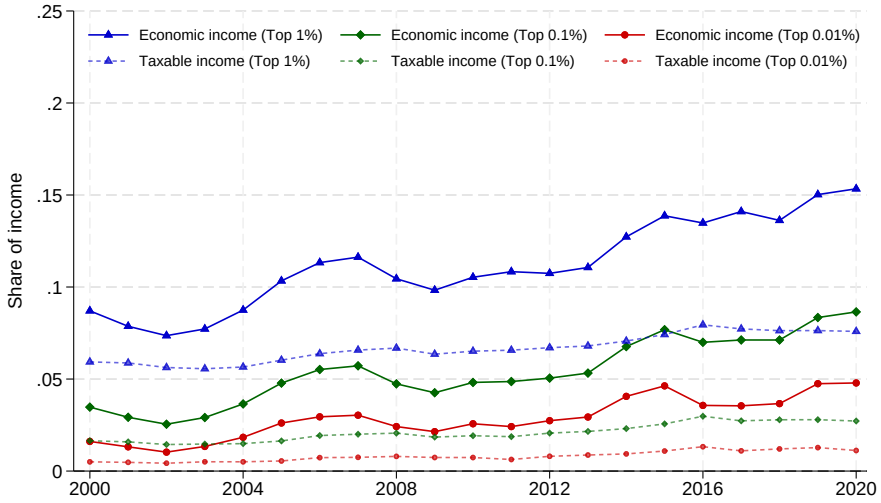

(d) % of Wealth



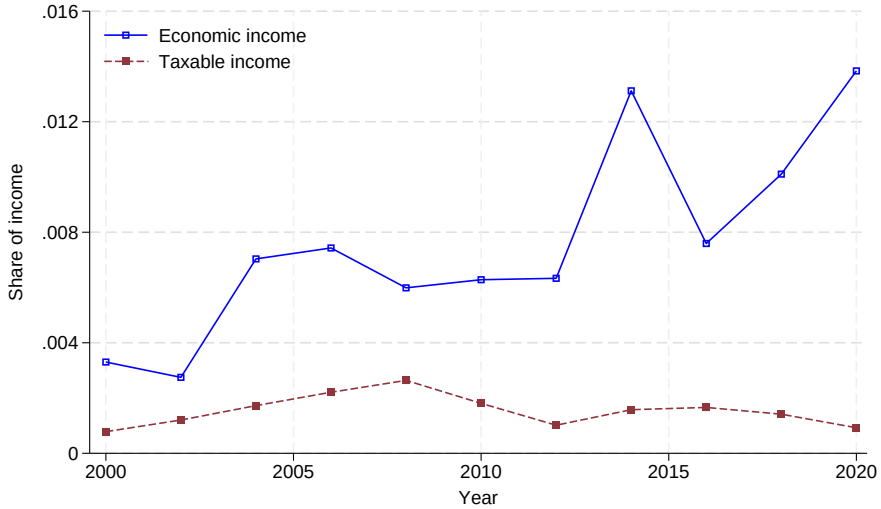

Notes: see text.

## Figure 11: Inequality of Fiscal Income vs. Economic Income

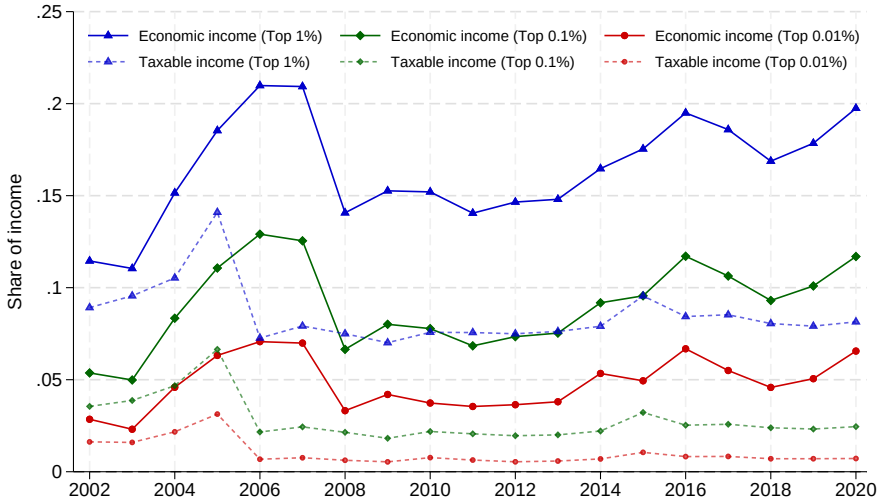
(a) By income group, Sweden




(b) Top .00045% by wealth (Rich list), Sweden



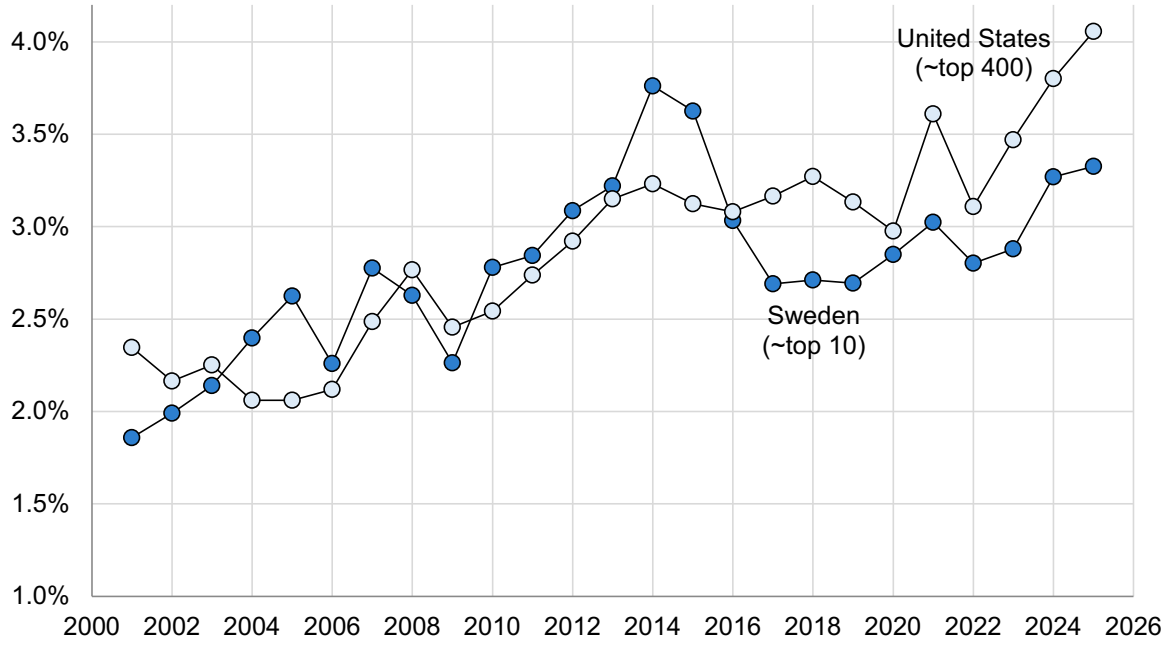

(c) By income group, Norway



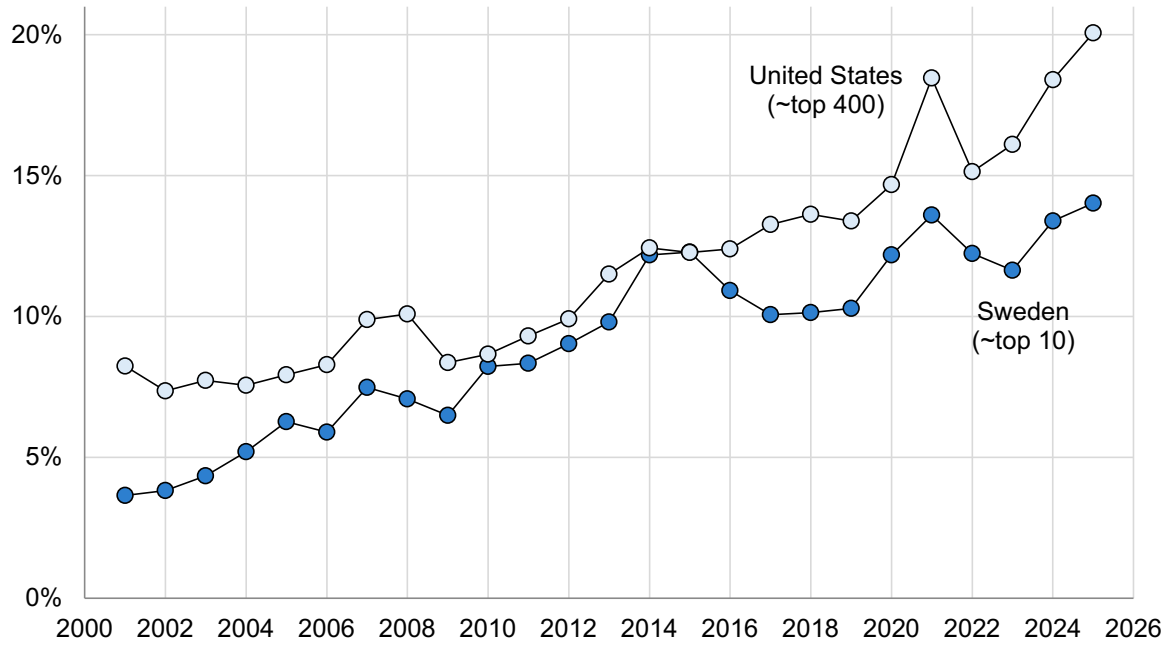

Notes: See text.

**Figure 12: Wealth of the Top 0.0002%: Sweden vs. United States**

(a) % of total household wealth

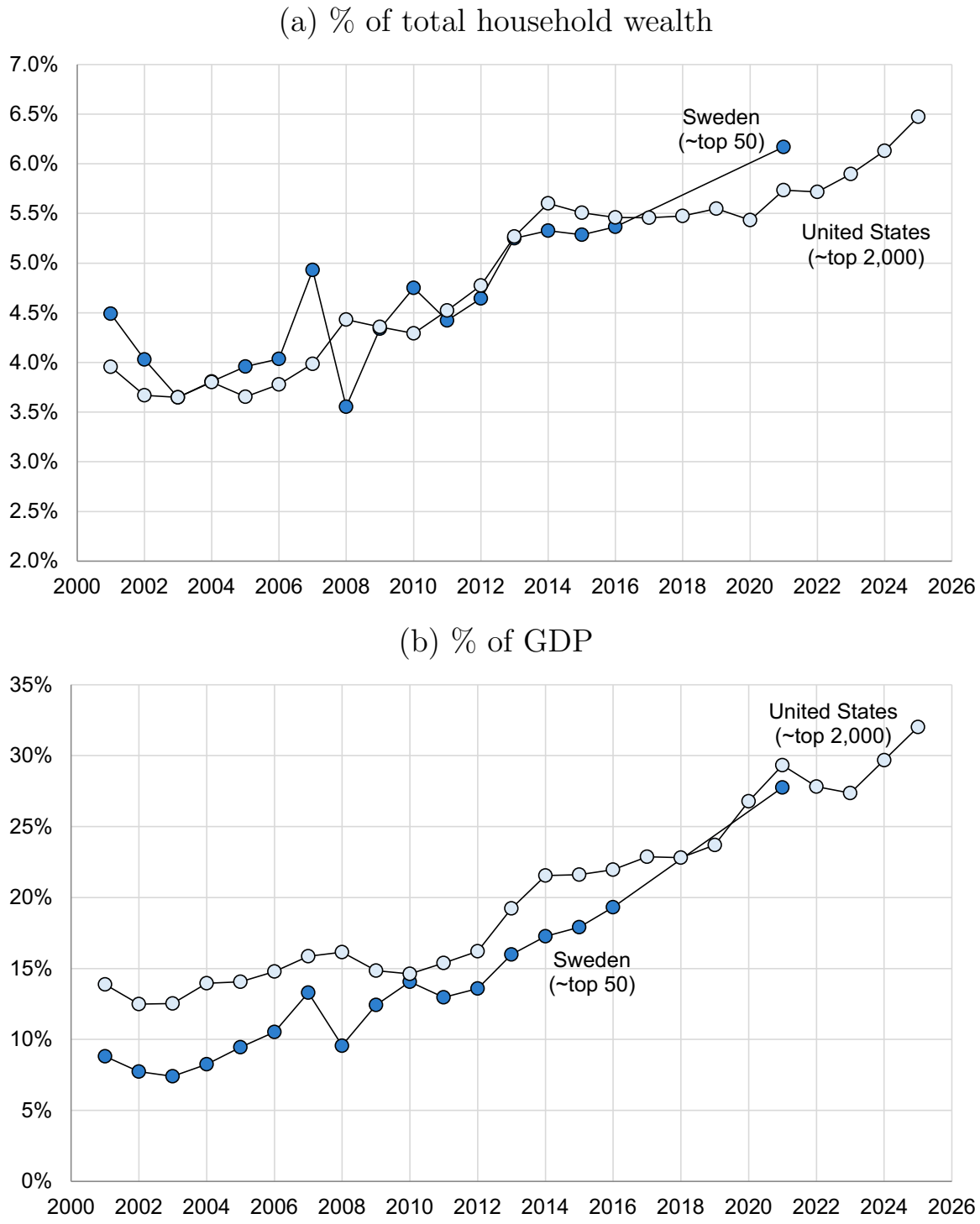



(b) % of GDP




Notes: This figure shows the evolution of the wealth owned by the top 0.0002% wealthiest households in Sweden and the US, relative to total household wealth (panel a) and to GDP (panel b). The top 0.0002% includes 10 households in Sweden and 384 in the US in 2025. Only resident households are included. US series are taken from Balkir et al. (2025). In Sweden, top 0.0002% wealth is computed by averaging end-of-year values from the *Forbes* real-time database since 2020 (and August 15, 2019 values for the year 2019). Before 2019, data are taken from the annual *Forbes* billionaires ranking, which typically reports estimates for February–March. When less than 0.0002% households are included in the *Forbes* list, the wealth of the missing top 0.0002% is imputed using standard Pareto-interpolation techniques. Total household wealth is the net worth of the household sector published by Statistics Sweden, estimated at mid-year by averaging year-end values.

**Figure 13: Wealth of the Top 0.001%: Sweden vs. United States**




Notes: This figure shows the evolution of the wealth owned by the top 0.001% wealthiest households in Sweden and the US, relative to total household wealth (panel a) and to GDP (panel b). Only resident households are included. US series are taken from the real-time inequality database of Blanchet et al. (2023), `https://realtimeinequality.org`. In Sweden, top 0.001% wealth is computed by merging rich lists compiled by Veckans Affärer (until 2016) and Aftonbladet (in 2021) to administrative data and keeping only tax residents. Total household wealth is the net worth of the household sector published by Statistics Sweden, estimated at mid-year by averaging year-end values.

# Appendix (for Online Publication)

## A General Data Sources

Data sources: Take national income from WID.world
Take tax payments from OECD Global Revenue Statistics database `https://stats.oecd.org/Index.aspx?DataSetCode=RS_GBL` (numbers below refer to series numbers in OECD database)

**Individual income tax (1100) and payroll tax (2000+3000).** All allocated to the corresponding individuals (including the employer share of payroll taxes). The refundable portion of refundable tax credits is removed: it is treated as a transfer, not a negative tax (meaning tax liabilities are always non-negative).

**Corporate tax (1200).** For corporate taxes allocated to owners, allocate to corresponding individuals. Then for the remaining corporate taxes, allocate proportionally to taxable income (i) above.

**VAT and other indirect taxes (5000).** We allocate proportionally to consumption (see below for country-specific details).

**Property taxes (4100).** Allocated to the owners of the corresponding properties. For residential property taxes (4110), taxes are observed at the micro level. For business property taxes (4120) they are generally not observed; we allocate them proportionally to the Swedish capital stock of Swedish businesses.

**Inheritance tax (4300).** To the corresponding heirs.

**Wealth tax (4200).** To the corresponding individuals.

## B Data Sources and Methodology for Sweden

Our population comprises all individuals aged 18 and over who were Swedish residents at some point during 2000-2020.

**Linking businesses to owners.** To link businesses to owners, we use four different data sources.

First, we collect information on shares held in unlisted firms from the so-called K10 tax returns. Owners of closely held businesses file the K10 return annually and the statements

determine how compensation to owners gets taxed.[13] We retrieve the universe of K10 returns during 2000-2020. These records include information on the active individual Swedish owners with links to firm identifiers.

Second, we collect the K31 returns during 2000-2020. These returns are filed annually for each firm and owner in listed firms and include dividends paid to the individual. They determine the dividend component from listed companies in capital income taxes due. For the 2000-2007 period when Sweden taxed wealth, these records also include information on shares held.

Third, we match the K10 and K31 returns to the Serrano Database, a longitudinal database with financial history of Swedish companies, provided to us by the Data Center of the Swedish House of Finance. In particular, the Serrano database retrieves information on financial statements as well as on ownership structures from the Companies Registration Office (Bolagsverket). We use data from the tax returns and Serrano to determine ownership shares as follows.

For listed firms that pay dividends, we simply divide the total dividends received in K31 by the total dividend payments recorded in Serrano. We follow the imputation methods of Bach et al. (2020) to determine ownership for years when dividends are not paid out. Shares in unlisted firms are deductible from the K10 returns together with information on the aggregate outstanding shares. We obtain the latter from Serrano.

Fourth, we complement the above strategy for determining ownership in unlisted and listed firms using a database called Holdings, provided by a private company called Modular Finance. Holdings provides snapshots of ownership in firms in different points in time. We retrieve the firm identifier, the names of the listed owners, and their shares. In some instances, we observe the owners' direct and indirect stakes in the company, separately. These data exist primarily for larger firms.

These steps deliver a dataset of ownership in listed and unlisted firms. When allocating retained earnings within the company to owners, one potential complication is that owners may hold shares in companies indirectly through holding companies. Fortunately, the Serrano database reports financial statements in a consolidated manner, where all the financial activities of subsidiaries have been aggregated to the parent-company level. This means that we do not need to construct the network of ownership structures across firms.

We start from the consolidated accounts and allocate retained earnings within companies as follows. Our main measure of economic profit at the firm level is the profit / losses after net financial income have been recognized. From this income measure we subtract non-taxable operating income, typically derived from investment income in other companies. We subtract dividends paid to avoid double counting as they are included in the fiscal income of the individual. For ownership in holding companies, we additionally subtract profits / losses from

[13]There is a limit to how much compensation the owners can get via dividends that are taxed at the preferential dividend tax rate. This limit is determined by the so-called 3:12 rules and depends, among other things, on past wage payments to owners.

participation in group companies. The resulting measure of firm income is then allocated to owners according to the shares calculated as described above.

**From fiscal income to comprehensive market income.** In constructing a gross income measure, we start from the fiscal income reported on individuals' tax returns. More precisely, our starting point is the total declared income, including wage earnings, business income as well as capital income.

We augment this measure with the employer-borne payroll tax components that are not transfers. We retrieve the total government payroll tax revenues component by component over the years 2000-2020 from The Swedish National Financial Management Authority (`https://www.esv.se/press-och-publicerat/publikationer/2023/tidsserier-statens-budget-m.m.-2022`). We compute the annual totals of components that are not transfers, thus excluding the pension and the unemployment insurance components. We divide these totals with fiscal totals to arrive at a payroll tax measure that is purged of the transfer components. Each individuals labor earnings are multiplied with this tax rate and the resulting value is added to the fiscal income concept above.

We finally add the retained earnings, computed above to arrive at a gross measure. This measure is inflated by the ratio of national income, retrieved from the World Inequality Database, to total gross income so that the income measure matches the macro total.

**Effective tax rates.** Our goal in this section is to arrive at individual-level tax payments of different types that match the aggregate tax payments provided by the OECD Global Revenue Statistics database (`https://stats.oecd.org/Index.aspx?DataSetCode=RS_GBL`).

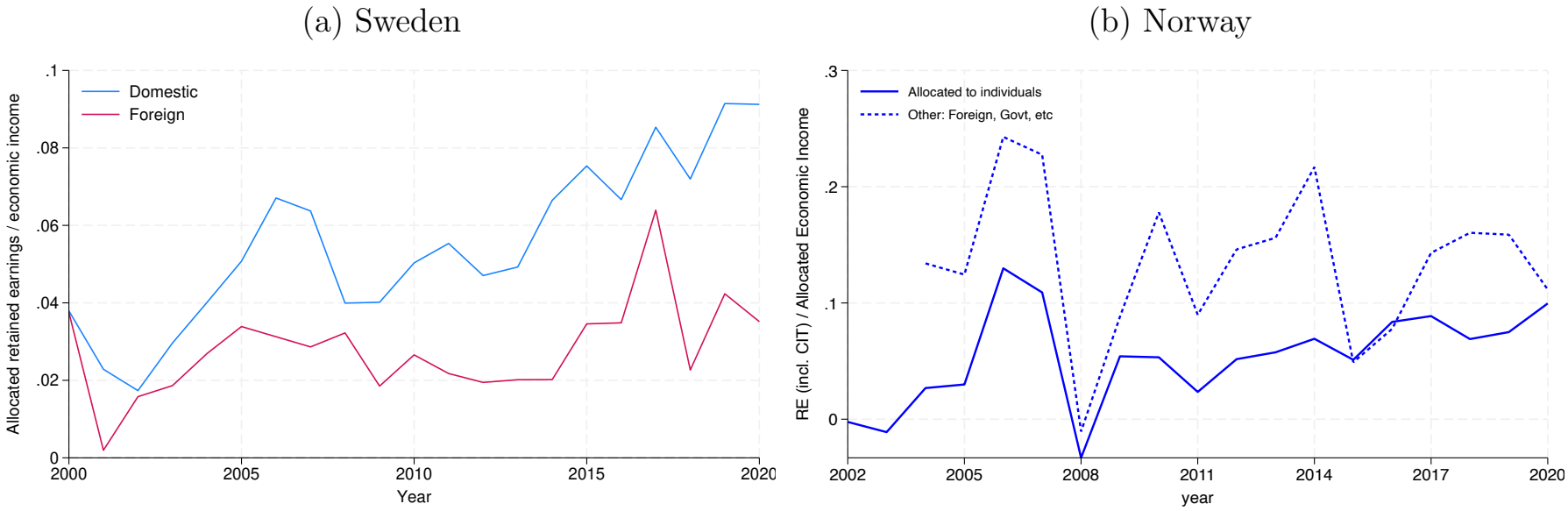
We start by allocating income taxes, payroll taxes (including the transfer-components) and individual-level property tax to individuals in proportion to their total taxes augmented by the payroll taxes calculated above. Corporate income taxes and property taxes paid by businesses are allocated as follows. We first allocate reported corporate taxes paid from the consolidated accounts of the Serrano database to owners in proportion to their ownership stakes such that the corporate taxes are non-negative. We then construct the difference between the OECD's reported total corporate tax revenues in Sweden and the total allocated corporate taxes from the Serrano-database. 40% of this difference is allocated to individuals in proportion to their wage earnings, while 60% is apportioned according to individuals' retirement benefit receipts.

The macro total wealth taxes are allocated to individuals in proportion to wealth taxes paid.

# C Data Sources and Methodology for Norway

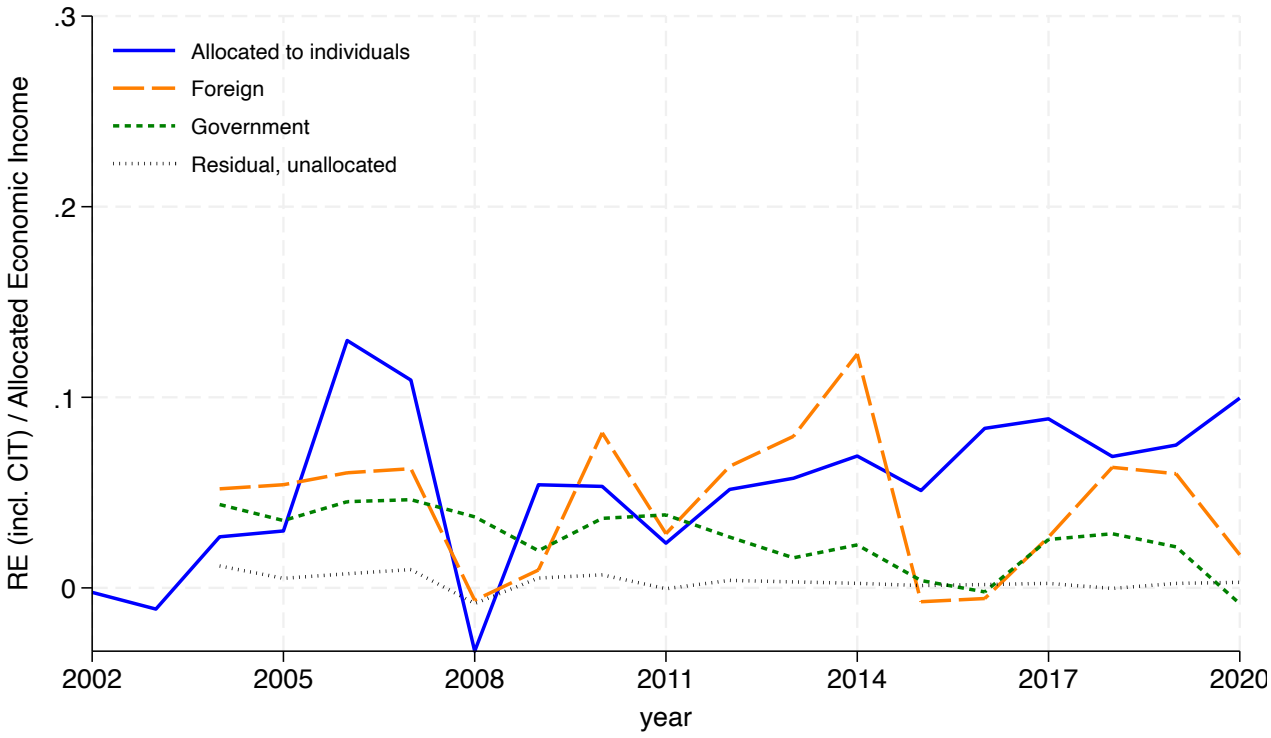
# D Additional Results and Sensitivity Analysis

## Figure A1: Allocating Retained Earnings




Notes: this figure plots the evolution of corporate retained earnings allocated to resident individuals in Sweden (panel a) and Norway (panel b). Retained earnings are expressed as a fraction of economic income, defined as fiscal income plus employer payroll taxes plus retained earnings plus allocated corporate taxes. For reference we also show retained earnings of Swedish and Norwegian corporations that are allocated to owners other than domestic resident households (government, foreign shareholders).

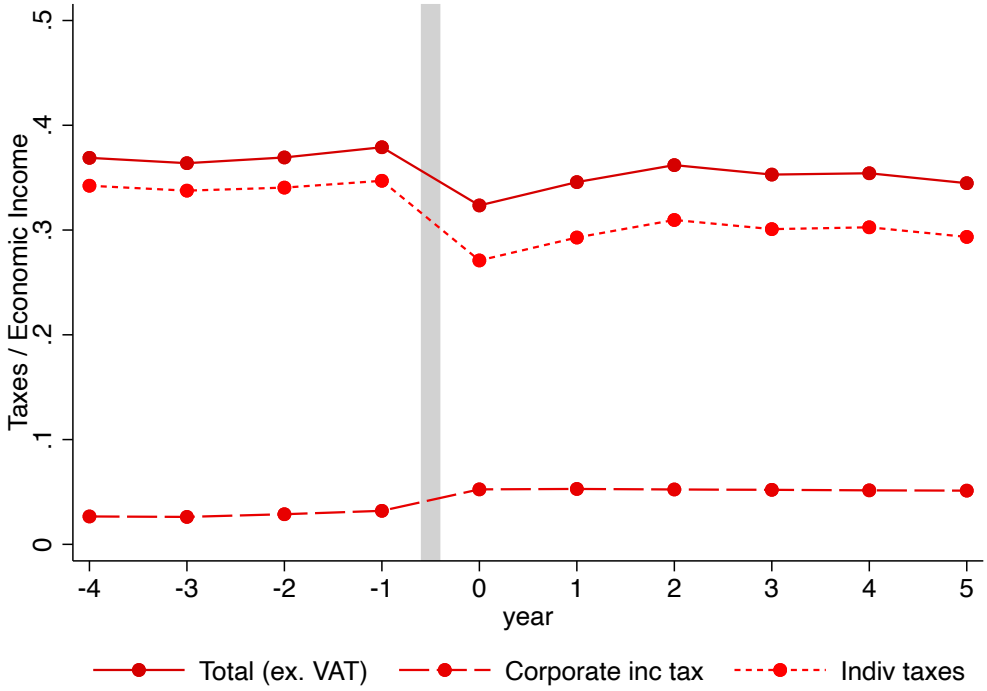
## Figure A2: Unallocated Retained Earnings in Norway




Notes: See text for our methodology to allocate retained earnings.

## Figure A3: Effect of Creating a Holding Company on Tax Payments

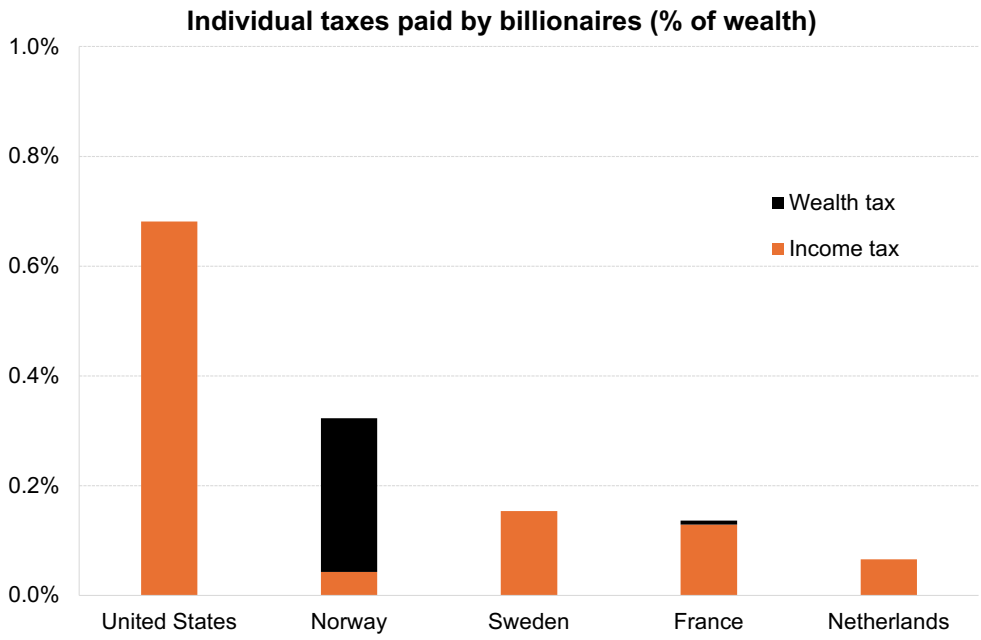
(a) Norway



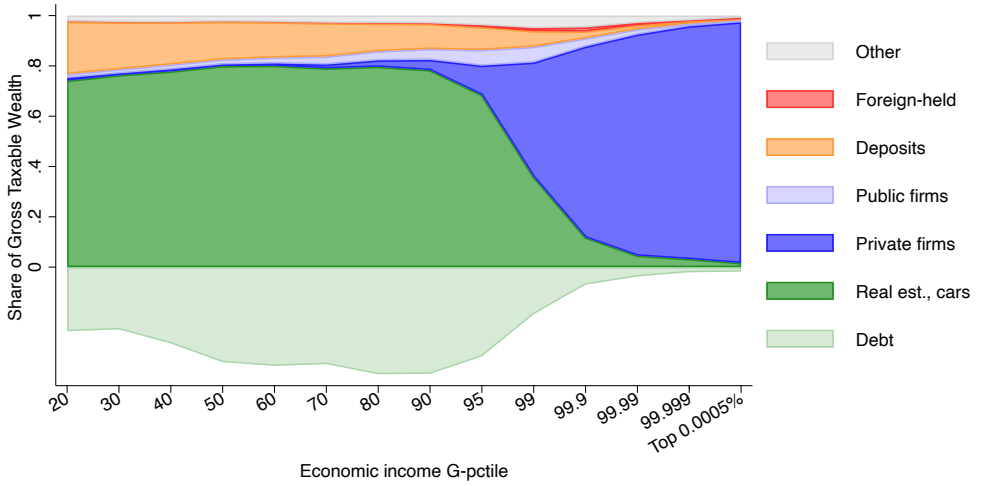

Notes: This figure shows the effect of creating a holding company in Sweden on individual vs. corporate income tax payments (expressed as a fraction of economic income).

# Figure A4: The Role of the Wealth Tax

## (a) International Comparisons




## (b) Composition of Wealth in Norway




Notes: see text.