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IZA DP No. 17373

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ABSTRACT

Capital Taxation, Retained Earnings and Inequality: Evidence from Dividend Tax Reforms*

This paper studies the effects of capital tax reforms on retained earnings, dividend tax revenues, and income inequality in Israel between 2001 and 2020. We analyze two major dividend tax reforms: a permanent rate increase in 2012 and a temporary tax relief in 2017. By combining administrative income tax data, household surveys, and national accounts, we find that both permanent and temporary capital tax changes substantially affect retained earnings. The five percentage points increase in the dividend tax rate resulted in an immediate increase of over 100% in the withdrawal of retained earnings and in dividend tax revenues. While the permanent tax increase did not cause a long-term change in retained earnings withdrawals, the temporary tax relief triggered a significant increase in retained earnings after the relief period ended. Using these reforms, we improve the measurement of income inequality by directly observing the distribution of retained earnings. We find stable levels of income inequality in Israel after 2007, with a top 10% income share of around 48%, a high level by international standards.

JEL Classification: D3, H2

Keywords: capital tax reform, income inequality, retained earnings

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1 Introduction

During the past few decades, capital has become increasingly central to the global economy, with both the capital income share and the wealth-to-income ratio rising significantly over time (Karabarbounis and Neiman, 2014; Piketty and Zucman, 2014). Dividends, among the various forms of capital income, have gained particular importance. In the United States, for example, the ratio of dividend income to wages has doubled, increasing from 2% in the early 2000s to over 4% by 2021 (Internal Revenue Service, 2021).

These trends demonstrate the growing importance of capital income taxation, particularly the taxation of dividends, for revenue generation and the redistribution of income. Dividend taxes, which are used in all major economies in the world, are also among the longest-standing forms of capital income taxation. Thus, understanding the behavioral responses to dividend taxation, its contribution to revenue, and its redistributive effects are central to the design of tax systems in the 21st century.

This paper focuses on two dividend tax reforms implemented in Israel during the 2010s. The first reform was a permanent increase in dividend tax rates; the second reform offered a temporary one-year tax relief. We rely on rich administrative tax data to analyze the behavioral responses to the reforms and their effect on shareholders' withdrawal of retained earnings and overall tax revenue. This allows us to contribute to the understanding and design of dividend taxation and its effect on income inequality.

We find significant behavioral responses from taxpayers to the reforms. The withdrawal of retained earnings more than doubled in 2011, prior to the permanent tax rate increase in 2012, and again in 2017 in response to the temporary rate reduction. Notably, although both reforms triggered similar short-term responses, their long-term effects differed. Specifically, the permanent five percentage point increase in the tax rate in 2012 led to a temporary increase in dividend tax revenues, without a corresponding reduction in the withdrawal of retained earnings in subsequent years. In contrast, while the temporary one-year rate reduction in 2017 also resulted in a substantial but short-lived increase in tax revenue, it was followed by a large decline in the withdrawal of dividends, reflecting an increase in retained earnings in later years.

The key findings align with and expand upon similar studies conducted in other countries. For instance, the responsiveness of dividend payments to tax cuts has been well-documented in the United States after the 2003 tax reform. Chetty and Saez (2005) found an "increase in dividend payments [...] following the tax cut". Yagan (2015) found that the reform had "zero impact on corporate investment", similar to the results in Sweden by Alstadsæter,

Jacob and Michaely (2017). Unlike these prior studies, this paper focuses on a permanent tax hike and a unique temporary tax relief, thus adding substantially to this literature.

The dividend tax reforms also provide a rare opportunity to observe the distribution of retained earnings across income percentiles. We find that retained earnings are predominantly concentrated among the top 10%, and more specifically within the top 3% of income earners. In both 2011 and 2017, over 90% of retained earnings were received by the top 1% of gross income earners. This level of concentration is more unequal than that of capital income in general, indicating that the income reported for these years is more unequal than it is in practice.[1]

This information is valuable for estimating the overall income inequality in Israel. Income inequality has increased in many rich countries during the past 50 years. Israel is no different. Dahan (2021) finds that inequality rose since the late 1970s and until the early 2000s, reaching levels that are high in international comparison (in 2019 it was ranked 7th highest out of 31 OECD countries (OECD, 2019)). However, since the early 2000s, studies have found a decrease in both market income inequality and disposable income inequality. This trend has been coined "a distinctive evolution" (Dahan, 2021), as it differs from the typical trend observed in other high-income countries.

An accurate picture of the evolution of income inequality in Israel is, nevertheless, limited. Previous research has primarily relied on household surveys (Dahan, 2021), or has focused on wage inequality (*e.g.*, Endeweld (2012) and Cornfeld and Danieli (2015)). While these studies have contributed valuable insights on inequality in Israel, they are somewhat limited in providing an accurate representation of income distribution at the top. The primary issue arises from their restricted coverage of capital income (see, *e.g.*, Piketty and Saez (2003); Yonzan et al. (2022); Berman and Milanovic (2024)). Household surveys in Israel capture only 4% to 8% of total capital income, which tends to be highly concentrated at the top of the distribution. This limitation likely biases inequality measures downwards and could obfuscate possible inequality trends.[2]

These caveats have become increasingly important due to the increase in the capital share of income in Israel. Between 2001 and 2020, the capital share in Israel increased by 10 percentage points, rising from 26% to 36%. This increase places Israel among the countries

[1]The distribution of retained earnings is typically difficult to observe directly. In many cases, when estimating income inequality measures, which take retained earnings into account, their distribution must be imputed rather than directly observed (see, *e.g.*, Piketty, Saez and Zucman (2018) and Alvaredo et al. (2020)). If not done carefully, these imputations can lead to measures of inequality that suffer from a downward bias.

[2]An important recent exception is Danieli, Gilat and Leventer (2024). They study top income shares in Israel from 2008 to 2018 using tax data.

with the highest capital share within the OECD.

The data we use to study the tax reforms enable us to provide accurate estimates of income inequality. These estimates aim to improve the existing limited picture by combining national accounts, household surveys, and confidential tax data to produce distributional national accounts (DINA) for Israel over the period 2001–2020. This allows us to distribute 100% of national income across 100% of the adult population. The key to this approach is the addition of missing income and missing population to the tax and survey data in a way that is fully consistent with the national accounts (Piketty, Saez and Zucman, 2018; Alvaredo et al., 2020). This approach follows a general framework that has been applied in other countries, but is flexible enough to take into account the unique aspects of Israeli data and economic evolution over the last 20 years. Notably, as described above, we use the dividend tax reforms as a way to estimate the distribution of retained earnings across income percentiles, which is absent even when detailed income data are available and therefore must be imputed (see, for example, Piketty, Saez and Zucman (2018) for a study of income inequality in the United States).

We find that the top 10% pre-tax income share has increased substantially between 2001 and 2007 from 40% to 48%. Since 2007, it has remained at constant levels, with minor fluctuations between 46% to 52%, but with no clear trend over time. This puts Israel among the most unequal developed economies in the world. This is supported by additional evidence relying on growth incidence curves for the period 2001–2020. We find that the observed increase in inequality is driven completely by the income growth of the top 10% between 2001 and 2006. From 2009 to 2018, growth has been equally shared across income deciles, with some lower deciles enjoying higher growth rates than higher deciles. This sheds new light on whether, indeed, income inequality in Israel has been decreasing gradually since the mid-2000s.

Using administrative tax data, we are also able to examine the effect of redistribution on inequality measures. We find that income taxes and national insurance contributions cause a reduction in the top 10% income share by approximately 5 percentage points. Although the period 2001–2020 contains several changes to the tax code, these changes did not bring a major shift in inequality reduction through income tax and national insurance contributions over time.

Our paper contributes to the literature on capital taxation and the effects of capital tax reform (see, for example, Chetty and Saez (2005); Romanov (2006); Yagan (2015); Alstadsæter and Jacob (2016); Alstadsæter et al. (2016); Alstadsæter, Jacob and Michaely (2017); Bastani and Waldenström (2020)). In particular, we are able to contribute to the under-

standing of behavioral responses to different types of capital tax reforms, and study a unique reform in which dividend tax rates were reduced for one year only. This enables a comparison of different changes to policy in terms of their effect on revenue and on the withdrawal of retained earnings. Importantly, the reforms also enable us to perform a direct estimation of the distribution of retained earnings across income percentiles.

These contributions are particularly important in light of recent evidence favoring capital income taxation over wealth taxation. While there has been extensive debate on the feasibility of a wealth tax in recent years, evidence from a normative perspective (*e.g.*, Boar and Midrigan (2023)) and a practical perspective (*e.g.*, Advani, Chamberlain and Summers (2020)) suggests that capital income taxation is preferred. More systematic research is needed to reach a definitive resolution to this ongoing debate. That said, a good understanding of the effective design and collection of dividend taxes is crucial for future improvement of such tax policies.

The paper also contributes to the literature on the measurement of income inequality by providing a unique opportunity to directly observe the distribution of retained earnings. This is important because the distribution of retained earnings is typically difficult to observe directly. As described above, in most cases, when estimating income inequality measures using the DINA approach and aiming to redistribute 100% of national income, the distribution of retained earnings must be imputed rather than directly observed (Piketty, Saez and Zucman, 2018; Alvaredo et al., 2020). This could therefore lead to systematic biases in income inequality estimates.

Furthermore, our research makes a contribution to the study of income inequality in Israel. While Dahan (2021) has offered the most comprehensive examination of Israeli inequality to date, his approach is based on household surveys. More recently, Danieli, Gilat and Leventer (2024) have made major efforts to study income inequality in Israel using tax data. They focus on top income shares spanning from 2008 to 2018, a time period after the drastic rise in inequality (2001–2006). We compare our findings to the existing research and address the discrepancies between our estimates and those of previous studies. Our main contribution to this literature is in the coverage of 100% of national income, which provides a more complete picture of inequality.

The remainder of the paper is organized as follows. Section 2 lays out the background for the dividend tax reforms. Section 3 presents the main analysis of the paper, describing the different effects of the dividend tax reforms. Section 4 uses the results of this analysis to produce new estimates of income inequality. We conclude in Section 5.

2 Background and Context

We begin with a broad description of the main features of the Israeli tax system. Israel operates a dual tax system for individual income. This system relies on a highly progressive tax schedule to tax labor income, business income of the self-employed, and capital gains. The marginal tax rates increase rapidly with individuals' income, with the top rate reaching 45% in 2011.[3]

Dividend income is taxed separately. Dividend taxes are treated as part of corporate taxation, and the revenues from both taxes are typically considered together. Following a major reform to corporate taxation in 1999, dividends are taxed at two different rates: substantial shareholders (those holding at least 10% of a company's shares) are taxed at a higher rate than small shareholders. From the onset of the 1999 reform and until the 2012 reform, the tax rates were 20% for small shareholders and 25% for substantial shareholders.

Dividend taxation is an important fiscal instrument for collecting revenue and redistributing income, given the substantial amount of capital flows and the concentration of capital income at the upper end of the income distribution. In Israel, this is of particular relevance due to the increase in the capital share of income over the past 25 years, especially between 2001 and 2010. As Figure 1 shows, the share of capital in national income increased by almost 10 percentage points between 2001 and 2020, from 27% in 2001 to 36% in 2020. This trend is partially attributed to the rapid expansion of Israel's high-tech sector, which has drawn significant capital investments in the last two decades.

An additional reason for the increase in the capital share is the rise of retained income in closely held firms, sometimes called *wallet companies*. This refers to a company established by an individual who is its only shareholder. There are a few advantages these companies provide to their shareholder. Most notably, they help the shareholder with tax planning and tax avoidance, enabling proprietors to reclassify personal income as corporate earnings, and to deduct some of their expenses. This reclassification allows owners to manipulate the amount, timing, and form of their compensation, whether as wages or dividends, or to spend the company's earnings directly on personal consumption or investments, thus circumventing the dual-taxation regime typically applied to dividend income. Among other benefits, individuals enjoy the returns of investing a share of their gross earnings, instead of their net earnings. As a result, the number of wallet companies grew significantly over time, from none in 2002 to between 14,000 and 17,000 by 2021 (Raz-Dror and Yemini, 2024).

[3]Individuals' labor income is also subject to mandatory contributions to the National Insurance Fund and health insurance. These contributions are equal to 7% and 5% respectively. They are capped, so they do not increase proportionally to income above the top income tax rate threshold.

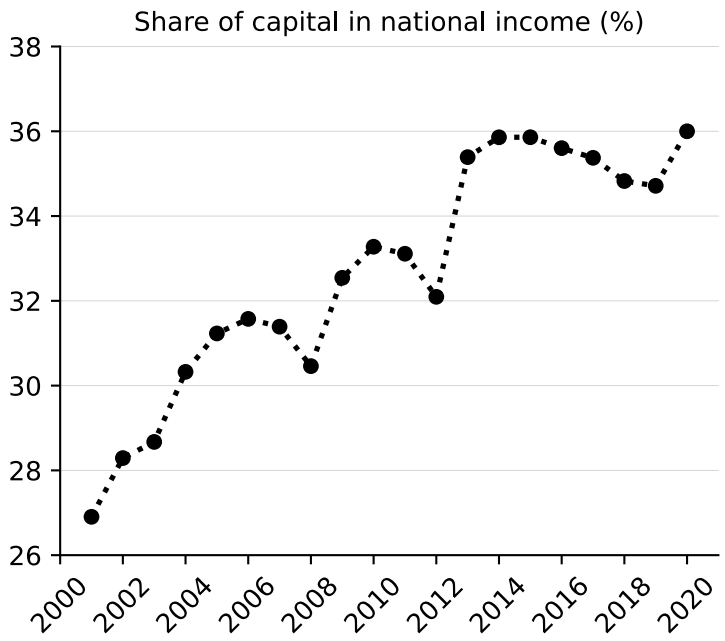

Figure 1: The capital share of national income in Israel, 2001–2020.

Notes: The data are taken from the World Inequality Database (WID, 2023).

The expansion of wallet companies coincided with a significant increase in retained earnings during this period. Retained earnings are an important form of capital income that is missing, by definition, from official tax and income statistics. They are an important tool that enables firms to use investments or savings to smooth financial and economic shocks over time. The combination of the two different kinds of firms leads to a delicate balance between the important and productive aspects of retained earnings, which are crucial for some firms, and the distortionary aspects of retained earnings as a form of tax avoidance (see also Chetty and Saez (2005); Yagan (2015); Alstadsæter and Jacob (2016); Alstadsæter et al. (2016); Alstadsæter, Jacob and Michaely (2017)).

Some of the tax advantages were addressed by legislation in the 2017 national budget (Raz-Dror and Yemini, 2024), and were, in part, a driver for the dividend tax reforms described below. However, retained earnings and the use of firm revenues for investment remain untaxed until realized. Similar structures, with comparable tax advantages, exist in other countries, such as Finland (Pirttilä and Selin, 2011), Norway (Alstadsæter et al., 2016), and Sweden (Alstadsæter and Jacob, 2016). Therefore, while some elements are particular to the Israeli system, the reforms analyzed in this paper could offer valuable insights for capital income taxation elsewhere.

2.1 The tax changes of 2012 and 2017

During 2011, tax collection in Israel decreased at an annual rate of 3%. In response, the Israeli government implemented tax reforms aimed at increasing tax revenues and reducing the budget deficit. A significant change was the increase in the dividend tax rate: the tax on small shareholders increased from 20% to 25%, while the tax on substantial shareholders increased from 25% to 30%. These changes were announced in 2011 and were set to take effect on January 1, 2012.

Anticipating the tax hike, individuals withdrew their dividends and retained earnings (as dividends) from firms toward the end of 2011. According to estimates from the tax authority, approximately NIS 17 billion in dividends was received by December 2011, boosting tax revenues by about NIS 3.7 billion. The short-term increase in tax revenues in 2011 was accompanied by a decrease of NIS 1.7 billion in dividend tax collection in 2012. Ultimately, the expected tax increase led to a net increase in dividend tax revenue of about NIS 2 billion (MOF, 2023).

The Israeli government implemented another dividend tax reform in 2017 with a similar objective: to increase revenue collection. Specifically, the government announced a one-time tax relief to encourage individuals to withdraw retained earnings. The dividend tax rate for substantial shareholders was temporarily reduced to its pre-2012 level of 25% for dividend income received during the first nine months of 2017, provided that this income was derived from corporate revenues accrued by the end of 2016. After these nine months, the rate for substantial shareholders reverted to 30%. Consequently, dividend income revenue more than tripled in 2017 and reached NIS 15.6 billion (compared to NIS 4.3 billion in 2016). As expected, this increase was temporary, with revenue falling to NIS 3 billion in 2018, nearly a third lower than the amount collected before the tax relief.[4]

Figure 2 summarizes the evolution of the dividend tax rate since 2008, including the reforms of 2012 and 2017. The two reforms allow us to address four key questions related to capital income, retained earnings, and income inequality:

1. What are the behavioral responses to the reforms in terms of withdrawing dividends?
2. What are the implications of the reforms for tax revenue?
3. How can the reforms guide the design of tax policy?

[4]Additionally, in 2017, a 3% surtax was imposed on very high-income earners with taxable income exceeding NIS 640,000. However, as part of the 2017 dividend tax reform, dividend income was exempt from this surtax for that year. The surtax was initially introduced at 2% in 2012, applied starting from the 2013 tax year, and increased to 3% in 2017, though it did not apply to dividends that year, as explained.

4. What is the distribution of retained earnings across income percentiles, and how can this information be used to improve income inequality estimates?

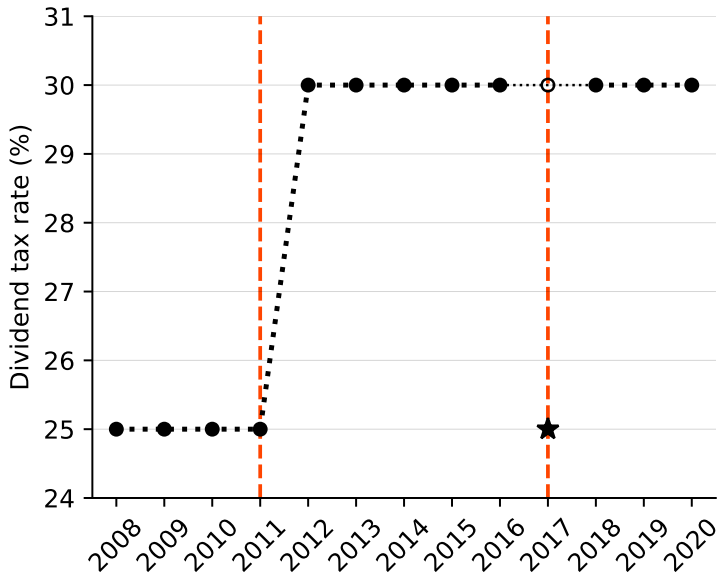

Figure 2: The dividend income tax rate for substantial shareholders in Israel, 2008–2020.

Notes: In 2017, there was a temporary reduction in dividend tax rates for dividends received during the first nine months of the year, provided they were tied to corporate revenues accrued by the end of 2016.

3 The Impact of the Dividend Tax Reforms

We address these questions using administrative income tax data from the Revenue Agency of the State of Israel. The data are tabulated by total gross income percentile for the years 2001–2020 and were made available to us by the Israeli Central Bureau of Statistics (ICBS) (CBS, 2023). The dataset provides extensive information for each income percentile. Specifically, it includes details such as the number of individuals within each percentile, the income threshold for each percentile, and the average gross and net income. Notably, for every percentile, we have a breakdown of total income by source: wages, business income, capital income, and other capital income, as well as comprehensive data on taxes paid. This includes contributions to health insurance, national insurance, and taxes on both wage income and other income sources.[5]

[5]The dataset also contains information on the number of male and female taxpayers within each percentile, along with their respective average incomes. This enables a highly detailed and precise analysis of the gender income gap in Israel. This falls beyond the primary focus of the current paper and is left for future work. That said, we present a basic analysis and suggestive evidence on the gender gap in Appendix A.

We treat *other capital income* as dividend income, although it includes additional types of capital income taxed at special rates, such as income from registered patents. Generally, these additional types of income are considerably lower compared to dividend income (see Appendix B for more details on this issue).

We also rely on national accounts and the labor share of income to construct our income totals. These data are taken from the World Inequality Database (WID, 2023).

3.1 Identifying the effect of taxes on dividends' withdrawal

We first address the behavioral responses to the reforms. The reforms are distinct in nature: the first included a permanent increase in the tax rate, and the second granted a temporary rate decrease. However, both are intended to incentivize individuals to withdraw their dividends, thereby boosting capital income reporting. The 2012 tax hike incentivized the payment of dividends at lower rates just before the increase took effect. Similarly, the 2017 reform achieved the same goal by providing a time-limited discounted rate.

The reforms have a substantial effect on the total value of the dividends paid to shareholders. Figure 3 illustrates that there is a marked surge in dividend income in the years of the two reforms. The figure presents dividend income as a share of national income, and compares this share to a counterfactual share based on interpolation, excluding the year of reform and the preceding year to avoid the potential effects of rate change anticipation. The size of the surge is calculated as the difference between the reported dividend income and the interpolated counterfactual, resulting in a significant increase of 3 to 4 percentage points of national income. In monetary terms, these excess dividends amount to NIS 35 billion (adjusted to 2021 values), or approximately USD 11 billion (2021).

We also use a regression-based method as an alternative way to study the effect of the tax reforms on the withdrawal of retained earnings. This approach overcomes the limitations of relying solely on an interpolation for a counterfactual analysis, as presented in Figure 3. Additionally, it allows us to determine whether all income percentiles were affected by the reforms or, rather, their impact was limited to a small fraction of the taxpayer population.

For these purposes, we treat the income dataset as panel data, where each percentile i in year t is characterized by its retained earnings withdrawn. Using this dataset, we consider the following specification

$$\log y_{it} = \alpha_i + \theta_t + \delta \cdot Reform_{it} + \epsilon_{it}\,, \tag{3.1}$$

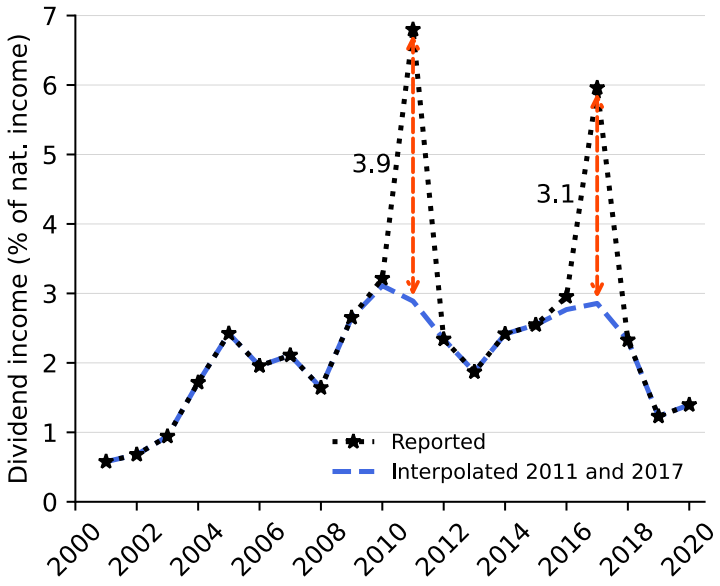

Figure 3: Reported dividend income in Israel 2001–2020 as a share of national income.

Notes: The blue line removed the reported data in the years 2010 and 2011 and 2016 and 2017, and replaced them with cubic interpolated data. The annotated red arrows indicate (in percentage points) the difference between the reported and interpolated data.

where the outcome variable is the logarithm of inflation-adjusted retained earnings withdrawn; α_i represents percentile fixed effects; θ_t represents year fixed effects; and $Reform_{it}$ is a dummy variable indicating whether percentile i is affected by the reform of year t (*i.e.*, 1 in 2011, 2017, or both, for percentiles above the threshold, and 0 otherwise). Note that we follow Gibrat's law and use the log transformation of withdrawn retained earnings to create a credible model for income dynamics (Gibrat, 1931).

We rely on Equation (3.1) to estimate which percentiles were affected by the reforms of 2011 and 2017 (either individually or for both years). We examine various thresholds: the top 20%, 10%, 5%, and 1%. This approach is based on the rationale that the reform likely had little to no impact on the withdrawal of retained earnings among low-income earners, as their share of total dividend income is minimal (see our discussion below on the distribution of retained earnings across income percentiles). The results of the estimation appear in Table 1.

The results show a significant and substantial effect of the reforms on the withdrawal of retained earnings at the top 1% income threshold. This effect is robust across all specifications. The estimated coefficients imply an increase of 60%–100% in withdrawn dividends among the top 1% as a result of the reforms.

Table 1: The reform effect on retained earnings withdrawn

	Top 20%			Top 10%			Top 5%			Top 1%		
Reform	0.15***			0.20**			0.34**			1.05***		
(only 2011)	(0.05)			(0.10)			(0.17)			(0.02)		
Reform		0.01			0.08			0.16			0.61***	
(only 2017)		(0.04)			(0.06)			(0.11)			(0.02)	
Reform			0.07			0.13*			0.24*			0.81***
(both 2011 and 2017)			(0.05)			(0.08)			(0.14)			(0.02)
R^2	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Observations	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000

Notes: The table reports results from panel OLS regressions with the dependent variable being the natural logarithm of inflation-adjusted dividend income by gross income percentile between 2001 to 2020. The regressions control for percentile fixed effects and year fixed effects throughout. Standard errors are clustered at the percentile level. *** $p < .01$, ** $p < .05$, * $p < .1$.

The table also shows that only the 2011 reform had a significant effect on withdrawn retained earnings for lower percentiles of the income distribution. It is plausible that these lower percentiles were unable to accumulate substantial amounts of retained earnings after 2011, and therefore remained unaffected by the 2017 reform. In sum, while the regression results reinforce the strong overall effect of the reforms on withdrawn dividend income, as shown in Figure 3, they also highlight that these effects are largely concentrated among the top 1% of income earners, especially for the 2017 reform.

3.2 Implications for tax revenue

Our findings confirm that the two dividend tax reforms led to an increase in the withdrawal of retained earnings as dividends. Given that dividends are taxed at special rates, as described earlier, this should have a large impact on tax revenue. Figure 4 presents results similar to those in Figure 3, now considering the dividend tax collected.

Figure 4 shows that the two tax reforms led to a substantial increase in revenue from dividend taxation. The revenue spikes are dramatic. Between 2001 and 2020, excluding 2012 and 2017, dividend tax revenue fluctuated between 0.25% and 0.5% of national income. In 2012, however, it increased to 1% of national income, and in 2017, it increased further to 1.5% of national income. During these years, dividend tax revenue also grew as a share of the total tax revenue, reaching about 4% in 2017 (MOF, 2023).

The recorded impact on reporting and revenue was caused by the behavioral responses of firms, *i.e.*, the incentive to pay dividends to shareholders following the changes in tax rates.

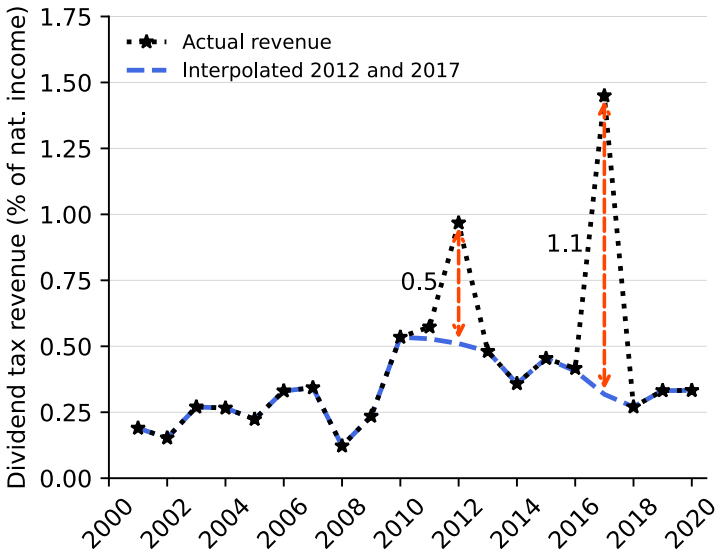

Figure 4: Reported dividend tax revenue in Israel 2001–2020 as a share of national income.

Notes: The blue line removed the reported data in the years 2011 and 2012 and 2016 and 2017, and replaced them with cubic interpolated data. The annotated red arrows indicate (in percentage points) the difference between the reported and interpolated data. The data are taken from the annual state revenue reports (MOF, 2023). Note that the increase in taxes due to the reported dividends in 2011 is described as revenue in 2012.

However, it is possible that different rate changes could have resulted in similar responses. For example, a smaller discount in 2017, such as lowering the tax rate to 27%, could have generated a similar response while leading to higher tax revenues. We are unable to compute specific elasticities, and our estimates are primarily based on the extensive margin. Nevertheless, considering these elasticities is important for tax design purposes.

3.3 Implications for tax design: Increase in retained earnings

Both dividend tax reforms were highly effective in leading to a significant increase in tax revenues. Arguably, the two reforms resulted in the withdrawal of large shares of retained earnings that were accumulated over extended periods of time.

As already noted above, firms retain earnings for reasons beyond tax considerations, such as funding investments or maintaining liquidity. Consequently, the dividend tax reforms may have distorted firms' behavior in terms of investment and dividend payments. Specifically, the unusual 2017 reform may have shifted firms' expectations, making them anticipate similar short-term tax cuts in the future, potentially increasing their propensity to retain earnings. This, in turn, could reduce tax revenues in the long run.

To study such effects, we analyze the withdrawn dividend income of different gross income percentiles over time. Figure 5 depicts the withdrawn dividend income of the top 1% (p99p100) and the 90th percentile (p90p91) as a share of the capital component of national income. This share remained relatively stable between 2004 and 2017 for both percentiles. It fluctuated between 6 and 8 percent for the top 1% and between 0.02 and 0.05 percent for the 90th percentile. The reform of 2017 led to a significant change for the top 1%. This group's share decreased to less than 3 percent after the reform, its lowest level for the last 20 years. We do not observe a similar decrease for the 90th percentile.

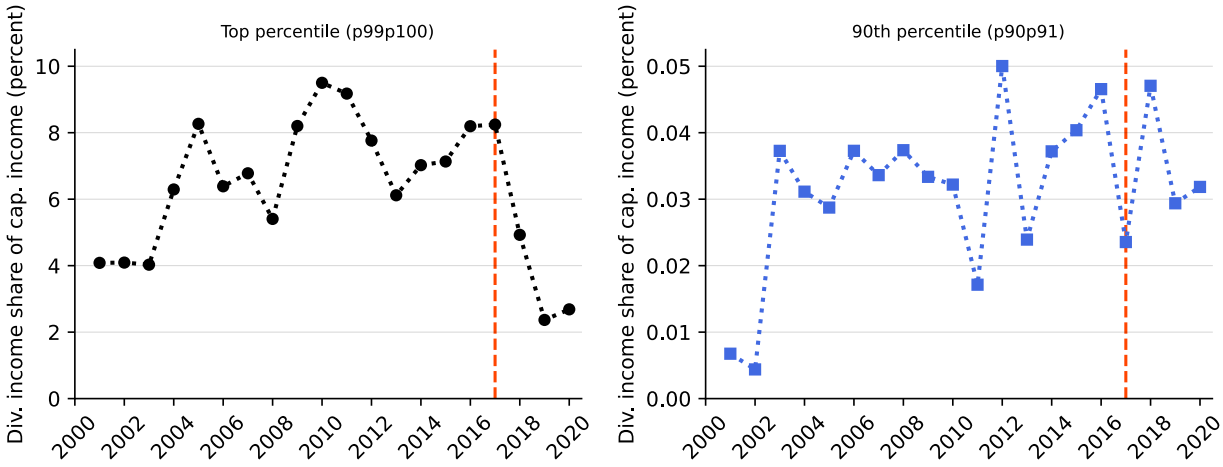

Figure 5: Dividend income at the top of the income distribution, 2001–2020.

Notes: The share of the top 1% (left) and 90th percentile (right) dividend income is presented as a share of the capital component of national income (in percent).

We focus on the share of dividend income from the capital component of national income because the capital share of income typically increases over time (see Figure 1). By isolating the capital component, we can better estimate the effects on retained earnings among different percentiles, which are not attributable to general trends in capital income. This approach allows for a more precise analysis of policy-specific impacts.[6]

Figure 5 clearly indicates a reduction in the withdrawal of retained earnings after the 2017 reform among the top 1%. It is possible that firms and shareholders anticipate similar tax discounts in the future, which lowers their incentives to withdraw dividends at higher tax rates. This is important not only from a tax collection perspective but also from an investment perspective, as it suggests an increase in retained earnings.

We study this effect in more detail using a regression-based analysis similar to the approach

[6] A similar picture arises when considering the average dividend income amounts rather than the share of the capital component of national income (see the figure in Appendix C).

described in Equation (3.1). We continue to consider the percentile-year panel and define a percentile as treated if it is above a specified threshold after 2017. Our preferred specification is a two-way fixed effects regression:

$$s_{it} = \alpha_i + \theta_t + \delta \cdot Post2017_{it} + \epsilon_{it}\,, \tag{3.2}$$

where s_{it} is the share of percentile i withdrawn dividend income from the capital component of national income in year t. α_i represents percentile fixed effects, θ_t represents year fixed effects, and $Post2017_{it}$ is a dummy variable indicating whether percentile i is treated in year t. The results appear in Table 2.

Table 2: The 2017 reform effect on retained earnings withdrawn

	Top 20%		Top 10%		Top 5%		Top 1%	
*Post*2017	-0.002		-0.003		-0.007		-0.036***	
(all years)	(0.002)		(0.003)		(0.006)		(0.000)	
*Post*2017		-0.001		-0.003		-0.006		-0.030***
(removed years)		(0.001)		(0.003)		(0.005)		(0.000)
R^2	0.91	0.91	0.91	0.91	0.91	0.92	0.94	0.95
Observations	2000	1600	2000	1600	2000	1600	2000	1600

Notes: The table reports results from panel OLS regressions with the dependent variable being the withdrawn dividend income share of the capital component of national income between 2001 to 2020. The regressions control for percentile fixed effects and year fixed effects throughout. Standard errors are clustered at the percentile level. *** $p < .01$, ** $p < .05$, * $p < .1$.

Table 2 illustrates a clear decrease in retained earnings withdrawn among the top 1% income earners after 2017. These findings support those presented in Figure 5, indicating that the 2017 tax reform led to an increase in retained earnings for this income group. The effect is confined to the top 1%, with no significant impact on retained earnings observed outside this percentile. The magnitude of the decrease for the top 1% is substantial, 3.6 percentage points. This represents about half of the baseline level of 6%–8% of the capital component of national income.

Table 2 also presents a specification where the years 2010, 2011, 2016, and 2017 are excluded from the analysis. The years 2011 and 2017 are considered anomalous due to the direct impact of the dividend tax reforms on withdrawn dividend income, while 2010 and 2016 are excluded to account for potential anticipation effects. The results remain qualitatively consistent with the baseline specification. While the magnitude of the effect on the top 1%

is slightly lower than in the baseline, the difference is minimal.

These results confirm that while the 2017 reform was highly effective in increasing tax revenue, it also caused significant distortions in capital taxation over time. The increase in retained earnings after the reform was accompanied by a sharp decline in dividend tax revenues after 2017. This may have led to *excess* retention of earnings equivalent to 3 percent of the total capital national income, or approximately 1 percent of overall national income. If sustained, such high levels of retained earnings could further reduce tax revenues in the coming years.

Importantly, the increase in retained earnings after 2017 implies that using tax data to estimate inequality measures may introduce a downward bias. This is because reported taxable income, by design, excludes retained earnings, which constitute a substantial portion of national income typically earned by individuals at the top of the income distribution.

3.4 The distribution of retained earnings across income percentiles

In many cases, when estimating income inequality measures, which take retained earnings into account, their distribution must be imputed rather than directly observed. For example, Piketty, Saez and Zucman (2018) argue that "allocating retained earnings proportionally to equity wealth is a reasonable benchmark".

The tax reforms of 2011 and 2017 provide us with a rare opportunity to observe the distribution of retained earnings across income percentiles. This direct observation allows us to perform a more accurate estimation of income inequality compared to standard alternatives that rely on imputed distributions.

Figure 6 illustrates the distribution of retained earnings within the top 10% of the gross income distribution. Retained earnings are calculated as the difference between the withdrawn dividend income and the interpolated dividend income by percentile for both 2011 and 2017, using data from 2001 to 2020. As expected, retained earnings are heavily concentrated within the top 10%, and more specifically among the top 3% of income earners. In both 2011 and 2017, more than 90% of retained earnings were received by the top 1% of gross income earners.

This level of concentration is even more unequal than that of overall capital income. Figure 6 demonstrates this by presenting the distribution of all taxable capital income reported in 2014. Although capital income is also highly unequal, it is still more evenly distributed compared to retained earnings in 2011 and 2017. In 2014, the top 1% received 84% of capital income, while the bottom 90% received more than 4% – in contrast to the negligible share

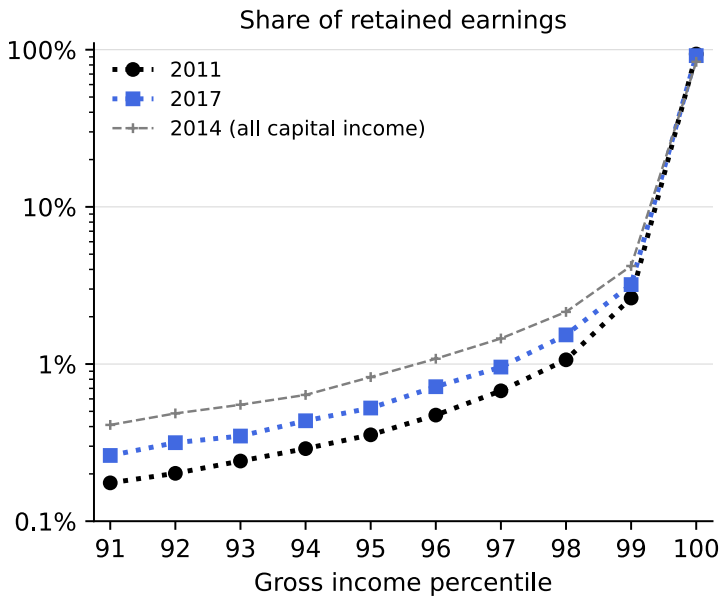

Figure 6: The share of retained earnings by income percentile.

Notes: The distribution is based on the difference between the withdrawn dividend income and interpolation of income by percentile in either 2011 and 2017, based on the data for the years 2001–2020. The grey line presents, as a reference, the distribution of all reported taxable capital income in 2014, rather than the distribution of retained earnings.

of retained earnings received by the bottom 90% in 2011 and 2017.

The greater inequality in retained earnings compared to overall capital income suggests that inequality measures for 2011 and 2017, based solely on reported income data, may be biased upward. This bias arises from the fact that dividend income retained across different years may not have been reported when received, leading to an overestimation of inequality in 2011 and 2017. The next section uses this information to adjust the income distribution data to provide more accurate estimates of income concentration.[7]

4 Income Inequality Estimates with Retained Earnings

The previous section identified retained earnings missing from income tax data by analyzing two dividend tax reforms. This information is important for accurately estimating income inequality, as retained earnings constitute a significant part of capital income, which is often concentrated at the top of the income distribution.

[7]In practice, the potential bias discussed may be minor, depending on the proportion of retained earnings within total capital income. If this proportion is not substantial, redistributing retained earnings based on observed capital income may result in only a modest bias.

In this section, we use this information along with the tax data described earlier, national accounts, and household surveys to provide the most accurate estimates of top income shares in Israel. This analysis is carried out within the framework of the Distributional National Accounts (DINA) approach (Piketty, Saez and Zucman, 2018; Alvaredo et al., 2020).

4.1 Data

We first describe the data sources that are combined to produce *Simplified Distributional National Accounts*, following Piketty, Saez and Zucman (2018), while making some necessary adjustments. We use the following sources:

- *Income tax data*: This is our primary source of income data, the same as that used in the analysis of the dividend tax reforms. The data are tabulated by total gross income percentile for the years 2001–2020. Within each percentile, income is divided into five categories: wages, business income, other income, capital income, and other capital income. We define *labor income* as the sum of wages, business income, and other income, and *capital income* as the sum of capital income and other capital income. The Israeli Central Bureau of Statistics (ICBS) provided these data to us (CBS, 2023). The tabulations cover only income received by tax-paying individuals, therefore missing some of the adult population in Israel and their income.

- *Household surveys*: The available income tax data do not cover the entire adult population. We use income data from LIS (2023) to account for the missing population. We include all adult non-filers and consider their labor and capital incomes (according to the labor and capital income definitions in the tax data). We use annual surveys for the years 2001–2020 to match the period in which tax data are available. The survey changed the way it defines its weights from 2019 onwards. This change makes the 2019 and 2020 waves substantially different from the previous ones and creates a discontinuity in the value of important variables.

- *National totals and labor shares*: We use data on total national income and the labor share of income for each year. National income is used as total income, and when combined with the labor share, it is possible to estimate missing labor and capital income. These data are sourced from the World Inequality Database (WID, 2023).

In addition, we use the size of the adult population (individuals aged 20 and over) as our control for the total population (this is taken from the Central Bureau of Statistics

(CBS, 2023)). We also use annual state revenue reports (MOF, 2023) to calculate post-tax inequality. These calculations are crucial to understand the contribution of taxes to redistribution. The reports include information on the total income tax revenues and national insurance contributions received. As the tax tabulations do not include 100% of the tax and national insurance contributions, the state revenue reports allow us to infer the missing contributed amounts.

In addition to the above, in our preferred estimates, we also include retained earnings based on the distribution estimated in the previous section. The assumption is that all retained earnings withdrawn in 2011 were accumulated equally between 2001 and 2011, and all retained earnings withdrawn in 2017 were accumulated equally between 2012 and 2017.

4.2 Constructing simplified distributional national accounts

As described above, even though the income tax data cover the vast majority of the population and income, these data still miss some of the population, since not all income-earning adults are taxpayers. In addition, the tax data miss a considerable amount of labor and capital income. This is due to a large share of national income that is not taxed, mostly capital income.

To address the limitations of tax data, we augment the data following the footsteps of the Distributional National Accounts (DINA) approach (Piketty, Saez and Zucman, 2018; Alvaredo et al., 2020). The aim is to capture 100% of national income. To do that, we add to the tax dataset missing income and missing population, while distributing the missing income in the most realistic way possible, subject to the data limitations.

The first step involves adjusting the capital income in the tax data by redistributing retained earnings according to their inferred distribution from the previous section. This adjustment generally increases income across all years except for 2011 and 2017, where overall dividend income will be lower compared to the unadjusted tax data. To make this adjustment, we simply add each percentile's inferred share of the total retained earnings for 2011 and 2017. We assume that all reported retained earnings in 2011 were accumulated equally between 2001 and 2011, and those in 2017 were accumulated equally between 2012 and 2017. Consequently, the incomes for 2018, 2019, and 2020 remain unadjusted.

The second step is adding the missing population. Using household surveys (LIS, 2023), we identify the non-taxpayer adult population and add this population and their respective income to the tax data. In most cases, this addition brings the total population to levels that are very close to those observed for the overall population. This step has relatively little

effect on inequality since the non-taxpayer adult population, while substantial in size, has a fairly dispersed income distribution and is not concentrated at the bottom of the income distribution as is the case in the United States (Piketty, Saez and Zucman, 2018).[8] We refer to the tax-paying reported population with the addition of survey-reported non-taxpaying population as the identified population. Their total income is referred to as the identified income. The difference between the national income and the identified income is the missing income.

Missing income is quite substantial even after adding the missing adult population. In most years, labor income is relatively well covered, but capital income is substantially under-covered. Appendix D presents the total identified income and population, as well as missing income and population during the time period of our analysis.

The third step in the construction of the DINA is the redistribution of missing income by income type, according to their distribution among the identified population (*i.e.*, after the addition of the non-taxpayer population). More accurately, we consider in each year P fractiles (over both taxpaying and non-taxpaying population). For each fractile i we observe the number of individuals (N_i), the total labor income (L_i), and the total capital income (K_i). Importantly, the addition of the missing population guarantees that $\sum_{i=1}^{P} N_i$ equals the total adult population. However, $\hat{L} = \sum_{i=1}^{P} L_i < L_{tot}$, and $\hat{K} = \sum_{i=1}^{P} K_i < K_{tot}$, where L_{tot} and K_{tot} are the total labor and capital incomes, respectively, which are calculated from the national accounts.

To add the missing labor and capital income we define fractile-specific increments

$$\begin{aligned} \Delta_i^L &= L_i \left(\frac{L_{tot}}{\hat{L}} - 1 \right) ; \\ \Delta_i^K &= K_i \left(\frac{K_{tot}}{\hat{K}} - 1 \right) . \end{aligned}$$

This guarantees that $\sum_{i=1}^{P}(L_i + \Delta_i^L) = L_{tot}$, and $\sum_{i=1}^{P}(K_i + \Delta_i^K) = K_{tot}$, and also that missing incomes are proportionally added with respect to the identified income. This process creates tabulations where the total population and total income are equal to the control totals. This allows a direct calculation of inequality measures. We focus exclusively on the top 10% share. Since the tax data do not provide a resolution finer than percentiles, and are also adjusted, we are unable to provide reliable estimates for the very top (*e.g.*, the top 1%, 0.1%

[8] In the years 2019 and 2020, due to changes in the household survey weights made in 2019, the identified number of non-taxpayer individuals increased by about 50% compared to 2018. This is not a real change, but a feature of the updated survey weights. We report the results for 2019 and 2020 given the same procedure applied for the years 2001–2018, but note this limitation.

or 0.01%).

4.3 The evolution of the top 10% share

Figure 7 presents the evolution of the 10% income share in Israel between 2001 and 2020. It includes four data series:

- Raw tax data: This series is based on the tax data, without adjusting the estimates for the missing population of non-filers and for missing income. It is available for 2001–2020.
- Identified income: This series adds the missing non-filer population to the raw tax data, with the corresponding income of this added population taken from household surveys. It is available for 2001–2020, with the years 2019 and 2020 marked differently due to the changes made in the household survey weights.
- Identified income with adjusted dividend income: This series uses the adjusted dividend incomes, while redistributing back retained earnings reported in 2011 and 2017.
- Distribution national accounts: This series is based on adding to the dividend-adjusted tax data the missing non-filer population and missing income. This way it accounts for 100% of national income and 100% of the adult population. It is available for 2001–2020, with the years 2019 and 2020 marked differently due to the changes made in the household survey weights.

The first two series, the raw tax series and the unadjusted identified income series, exhibit a very similar trend in inequality. In both cases, the top 10% share increased between 2003 and 2006, followed by a gradual and slow decrease, with the years 2011 and 2017 as notable outliers. This similarity arises because the non-filer population added to the raw tax data to create the identified income is relatively small and not particularly poor. Consequently, including this population raises both the total income and the income of the top 10% (since this group now includes more people), resulting in a top 10% share that is not significantly higher than in the raw data.

Adjusting the dividends by redistributing the accumulated retained earnings results in a series that closely resembles the identified income series in most years. As expected, this adjustment results in substantially lower inequality for 2011 and 2017. This is because the identified income for those years includes excess dividend income that should be attributed to earlier years. Naturally, redistributing this income over 2001–2010 and 2012–2016 increases

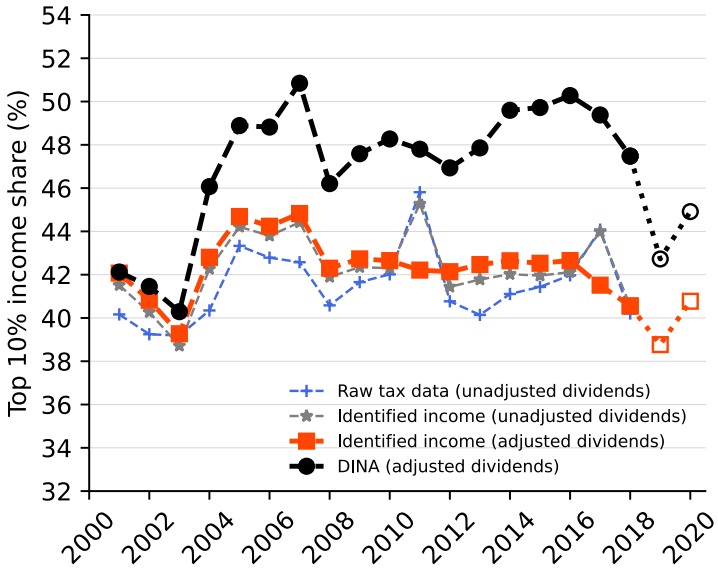

Figure 7: The evolution of the top 10% income share in Israel 2001–2020.

Notes: The chart shows estimates based on four series: (i) Raw tax data – without adjusting the estimates for the missing population of non-filers and for missing income, and without adjusting reported dividends for retained earnings; (ii) Identified income – adding the missing non-filer population to the raw tax data; (iii) Identified income with adjusted dividends; (iv) DINA – after adjusting dividends for retained earnings based on the tax reforms, and adding both the missing non-filer population and missing income.

the estimated top 10% shares relative to the unadjusted series, though these differences are minor. This adjusted series presents a clearer, smoother trend of decreasing inequality between 2007 and 2018.

The Distributional National Accounts (DINA) series differs substantially from the other three series. It shows a sharp rise in inequality between 2003 and 2007, reaching levels 5 to 8 percentage points higher than the other series. After 2007, the DINA top share shows no clear trend until 2018. The significant decrease in inequality from 2017 to 2018, 2019, and 2020 in the DINA series is also an artifact of changes in household survey weights, which increased the representation of the missing population in the 2019 and 2020 data. This decrease may also be driven by the increase in retained earnings at the top of the distribution, as shown in Figure 5.

The DINA series shows higher levels of income inequality than the identified income series, as it captures missing income that is predominantly concentrated among top income earners. This missing income is primarily capital income, which is much more unequally distributed than labor income, and its share among top percentiles is particularly high. Importantly, the DINA series does not exhibit a clear downward trend between 2007 and 2018. This

stands in contrast to what has been shown using survey data in the past (Dahan, 2021) – where income inequality has been slowly decreasing in Israel after the late 2000s (also see Appendix E).

4.4 The distribution of growth, 2001–2018

To better understand the evolution of income inequality between 2001 and 2018 we construct growth incidence curves (GICs) for different time periods. GICs present the relative change in income at different ranks of the distribution (Ravallion and Chen, 2003).

We analyze the distributional incidence of growth by decile based on two income series: (i) using the identified income (*i.e.*, tax data augmented by survey data on non-taxpayers); and (ii) using the distributional national accounts. Figure 8 presents the GICs for different time periods. The figure shows a clear downward trend between deciles 2 and 9 across 2001–2018, indicating that outside the top decile, the income distribution has been compressed, as indicated by household surveys alone (Dahan, 2021). Including the top decile, and especially after accounting for missing income, shows that the top decile enjoyed much higher growth rates compared to the rest of the distribution in the period 2001 and 2006. Over this period, incomes basically stagnated for deciles 2–9 but grew at a fast rate for the top decile. From 2009 onward growth has been distributed fairly equally across the distribution, which is indicative of the stable trend of the top 10% depicted in Figure 7.

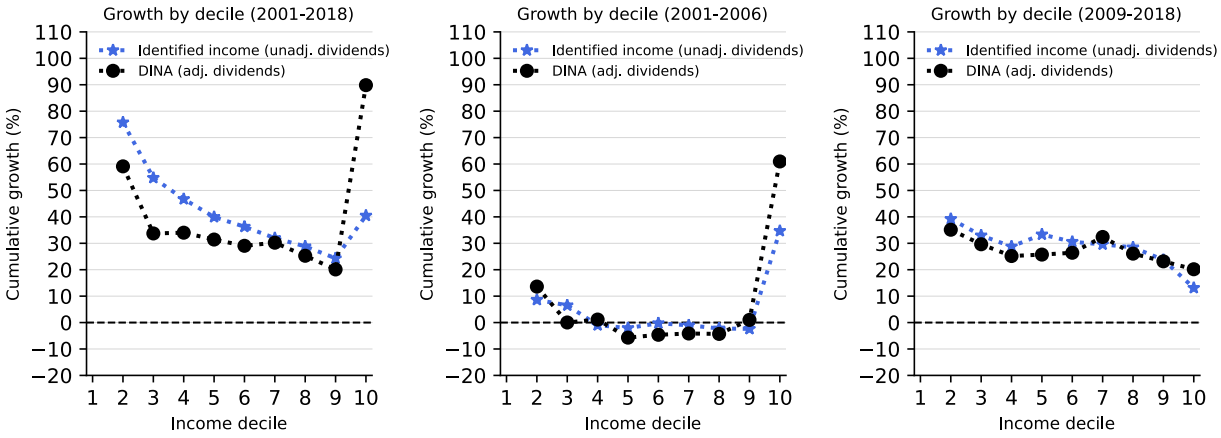

Figure 8: Cumulative growth incidence curves for Israel, 2001–2018.

Notes: The curves use the identified income (tax data + survey-based income data for non-taxpayers) and the DINA series. The first decile is excluded from the GICs to avoid bias due to zero incomes. The growth rates are adjusted for inflation using the GDP deflator.

Figure 9 shows similar curves with annualized growth rates. The GICs are very similar to

those presented in Figure 8, but provide the ability to compare different periods in a more intuitive way.

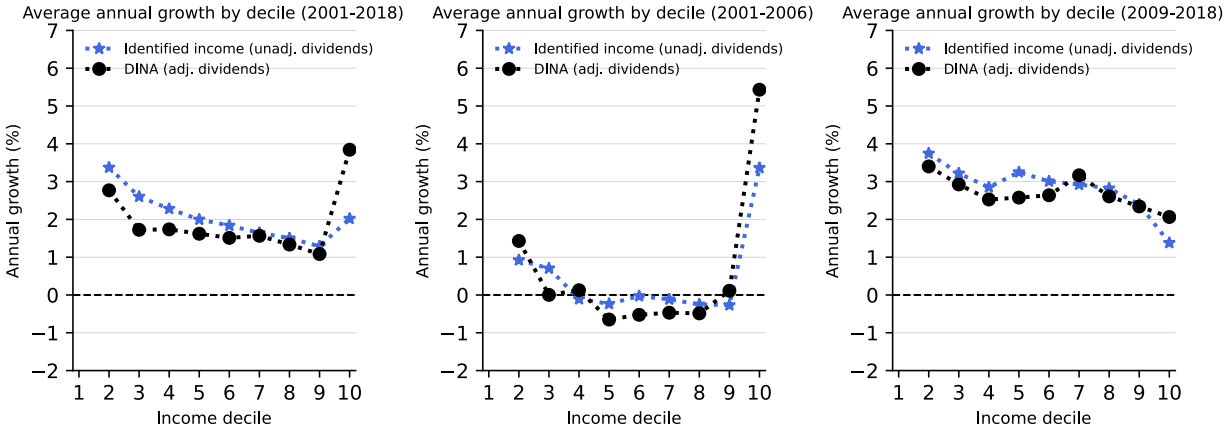

Figure 9: Annualized growth incidence curves for Israel, 2001–2018.

Notes: The curves use the identified income (tax data + survey-based income data for non-taxpayers) and the DINA series. The first decile is excluded from the GICs to avoid bias due to zero incomes. The growth rates are adjusted for inflation using the GDP deflator.

Both sets of GICs indicate that the period 2001–2006 has been qualitatively different from the period 2009–2018. In the former, the top 10% of income earners exhibit distinct dynamics, both with and without adjustments. Their income grew annually by 4%–6% on average. For the rest of the distribution, that period was effectively a period of zero growth. In contrast, income growth was evenly distributed between 2009 and 2018, with all deciles enjoying similar annual growth in the case of the DINA series. The identified income series show very slow growth for the top decile in comparison to lower deciles.

The period 2009–2018 is specifically important as it saw the major growth of the high-tech sector in Israel. During this period, this sector grew from a stable level of 11% of GDP (2005–2012) to 15%. This was driven by major capital flows, primarily from US-based funds and businesses. Nevertheless, this period was not characterized by growing inequality. It is possible that this can be partly explained by the large scale of retained earnings, as described previously.

4.5 The impact of taxation on inequality reduction

This subsection studies post-tax inequality. The tax data enable us to deduct income tax and other contributions from individuals' gross income for each income percentile. This information is crucial for evaluating the progressivity of the income tax system and, consequently,

its impact on inequality reduction. Unfortunately, the data do not include transfers, but only taxes and payments for national insurance and public health insurance.[9]

The tax and insurance payments recorded in the tax data do not accumulate to 100% of the income tax and national insurance revenues. First, the data only include income tax payers, thus they miss national insurance payers who do not pay income tax. Second, the data do not have information on individuals employed by the defense forces. To account for missing tax and insurance payments we use the same methodology used for adding missing income. The total missing payments are calculated by comparing the total reported in the tax data to the total tax and insurance contributions reported in the National Insurance Institute and the Ministry of Finance state revenue reports. Once calculated, the missing payments are simply distributed based on the reported payments in the tax data.

We present our main results in Figure 10. Note that, in contrast to the series presented in Figure 7, Figure 8 and Figure 9, here we do not redistribute back the retained earnings accumulated over time, which were reported in 2011 and 2017. The reason is that it is not possible to accurately estimate the taxes paid on this income.

The left panel in Figure 10 presents the top 10% income share before and after taxes for the identified income (*i.e.*, without the addition of missing income, and with unadjusted dividends) and for the DINA (with unadjusted dividends). The post-tax top 10% shares are lower than the pre-tax top shares, as expected. Yet, they follow the same overall trend.

The right panel of Figure 10 shows how taxes and national insurance contributions reduce top income shares (that is, the difference between the pre- and the post- tax series in the left panel). For identified income, there was a gradual decline in tax progressivity between 2001 and 2011. The level of progressivity remained stable between 2013 and 2018. In the case of the DINA, where taxes and insurance payments were augmented to account for missing tax revenue, there is no such trend. Over the entire time period (2001–2018) the level of tax progressivity remained relatively constant, between 4.5% and 5.5%, less progressive than what is observed using only identified income. This difference is largely due to the missing capital income in the identified income. Capital income is both more unequally distributed and typically subject to lower effective tax rates compared to high labor income, thus reducing the overall progressivity.

[9]Health insurance is universal in Israel, and is administered by the National Insurance Institute.

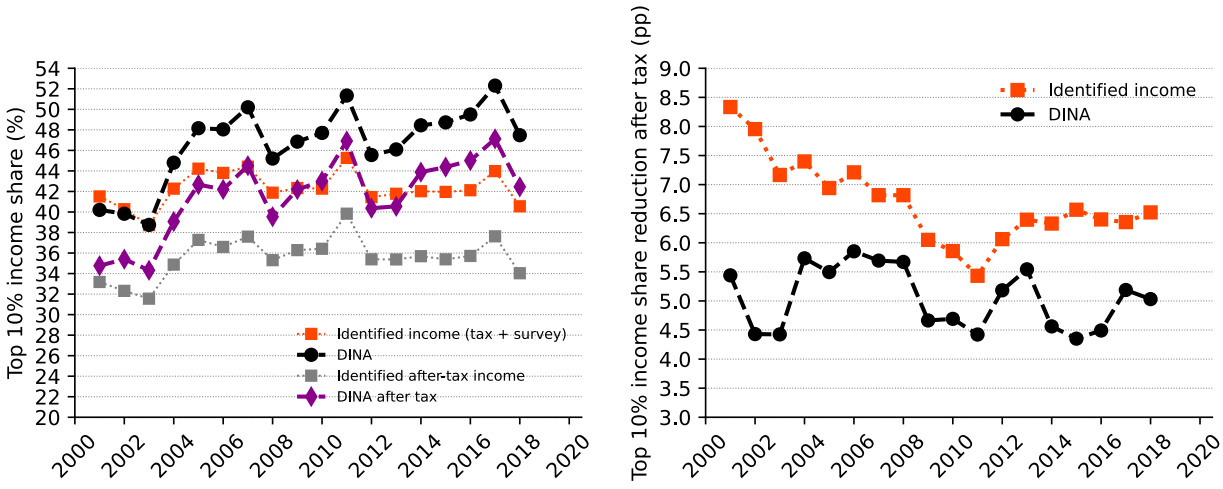

Figure 10: Pre- and post-tax top 10% income shares in Israel, 2001–2018.

Notes: The left panel shows different estimates of pre- and post-tax estimates, based on the identified income only, and on the DINA. The right shows that difference (measured in percentage points) between the top 10% shares based on the two income series.

5 Conclusion

In this paper, we studied the distribution of national income in Israel from 2001 to 2020. This period covers the emergence of the "start-up" nation and two dividend tax reforms: a permanent increase in rates in 2011 and a one-year tax relief in 2017. These reforms provide valuable insights into behavioral responses to capital taxation and the impact of underreporting of capital income on estimates of income inequality.

A key observation is that the two different designs of a tax policy change resulted in large and very similar responses in terms of retained earnings withdrawal. This demonstrates the efficiency of short-lived tax reliefs in incentivizing the distribution of dividends. At the same time, it is possible that the 2017 tax relief was not the minimal discount that would have achieved the same outcome. For instance, a temporary reduction in rates from 25% and 30% to rates higher than 20% and 25%, respectively, could have still led to a similar behavioral reaction, and thus to higher tax revenues.

In addition, we find that the short-lived tax relief of 2017, led to an increase in retained earnings and lower dividend withdrawal in the longer run. It is possible that the tax relief led to a change in expectations of high dividend income earners. Such a change could lead to anticipation of similar future reliefs, and thus incentivize tax planning and lower dividend withdrawal.

Studying the evolution of income inequality in Israel we find that the pre-tax income share

of the top 10% increased substantially between 2001 and 2007, rising from about 40% to approximately 48%. Since then, it has remained relatively stable, fluctuating between 46% and 52%, without a clear trend over time. This places Israel among the most unequal developed economies globally, challenging the notion of a gradual decrease in income inequality in Israel since the mid-2000s.

Additionally, we constructed growth incidence curves for the period 2001–2020. Our analysis revealed that the observed increase in inequality is primarily driven by the income growth of the top 10% between 2001 and 2006. From 2009 to 2018, income growth has been more evenly distributed across deciles, with some lower deciles experiencing higher growth rates than upper deciles.

Using tax data, we also investigated the effect of redistribution on inequality measures. We found that income taxes and national insurance contributions collectively reduce the top 10% income share by about 5 percentage points. Despite several changes in taxation in Israel between 2001 and 2018, there has been no significant shift in the extent of inequality reduction through income tax and national insurance contributions over time.

Overall, our paper highlights the role of dividend taxation and retained earnings in influencing taxpayer behavior and income distribution. Our findings emphasize the importance of designing tax policies that efficiently target dividends and raise revenue without causing significant distortions or abrupt shifts in taxpayer expectations.

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A The Gender Gap in Income

While beyond the scope of the main analysis of this paper, the main dataset used in the paper allows uniquely addressing the gender gap in Israel.

The income tax dataset include tabulations by percentile of total reported income. Within each percentile, the information is broken into the number of female and male tax payers. The average income of female and male tax payers within each percentile is also given. This enables studying the evolution of the gender gap in income in Israel. The only caveat is that this analysis is based on tax data only, without accounting for missing income. This is because the information about how different income sources are distributed between men and women is not included in the data.

The first important observation is about the share of women among taxpayers. Figure A.1 presents how this share has evolved since 2001. In 2001, women consisted of about 47% of taxpayers. This statistic has slowly, yet steadily, increased since. In 2020, women represented 50% of the tax paying population (50.19% of the entire population in 2021). This increase is driven by the rise in labor force participation among women (Dahan, 2021). It is therefore expected that women entering the labor force would be overrepresented in the lower income percentiles. Indeed, Figure A.1 shows that women consist of about 54%–58% of the bottom 10% and bottom 50% of income earners. There was an increase in these statistics over time, however, this increase is substantially slower than the increase in overall share of women among tax payers. This means women became not only more represented among lower income groups but also among top income groups.

Figure A.2 presents the evolution of the share of women in top income groups. Between 2001 and 2020, the share of women in top income groups increased substantially, however, it is substantially lower than 50%. Women consisted of only 20% (10%) of the top 10% (1%) income earners in 2001, compared to 26% (20%) in 2020. These results indicate a narrowing income gap, in the sense that women are less underrepresented in top income groups today compared to 20 years ago. Yet, they are still substantially underrepresented.

Figure A.2 also compares the case of Israel to Australia, Denmark and Italy, studied by Atkinson, Casarico and Voitchovsky (2018). Women are consistently more underrepresented in top income group in Israel compared to these countries. The differences, however, especially compared to Denmark for the top 1% income group, are small.[10]

[10]We note that addressing this question using tax data is challenging in many countries, since married couples often file taxes jointly. For this reason, the number of countries for which such a comparison can be done using tax data is limited.

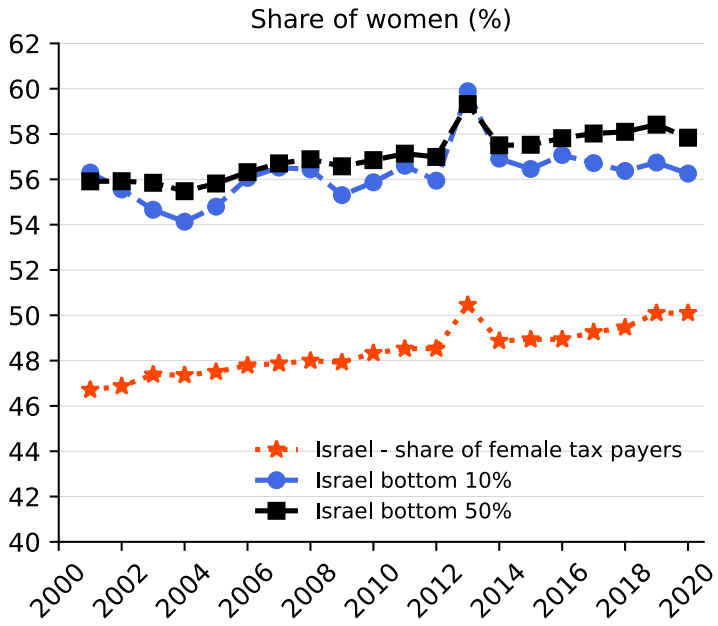

Figure A.1: The share of women at the bottom of the income distribution.

Notes: The panels show the share of women among overall taxpayer population (red), bottom 10% (blue) and bottom 50% (black) of income earners in Israel. The estimates are based on tax data, ignoring missing incomes.

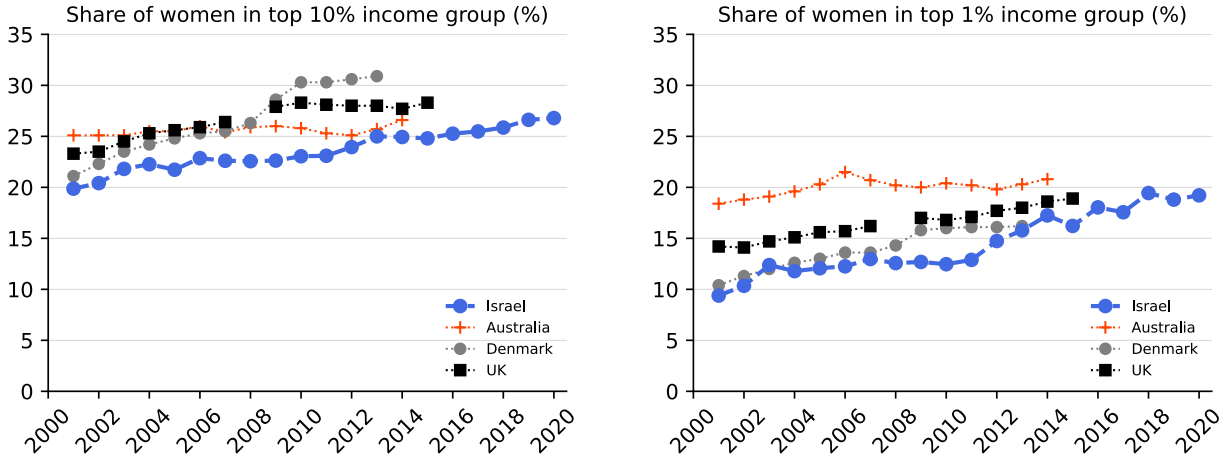

Figure A.2: The share of women in top income groups.

Notes: The panels show the share of women in the top 10% (left) and 1% (right) of income earners in Israel, Australia, Denmark and Italy. The estimates for Israel are based on tax data, ignoring missing incomes. The estimates for the other countries are from Atkinson, Casarico and Voitchovsky (2018).

We also calculate the income gap, defined as the difference between men's and women's incomes, as shown in Figure A.3. In 2001, women's incomes were 56% of men's. This pro-

portion has gradually increased, reaching 62.5% by 2020. Despite this modest improvement, a persistent gap remains, and is closing at a slow rate.

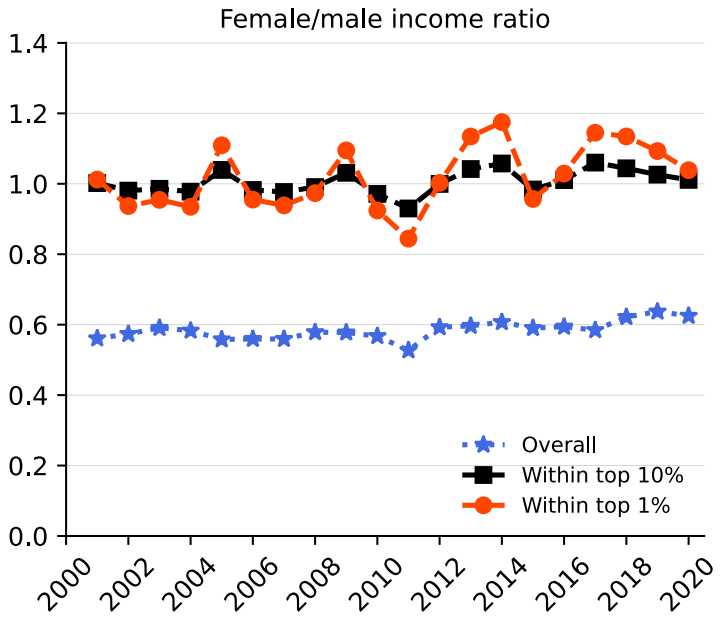

Figure A.3: The ratio between the average income among women and men.

Notes: The blue line shows this ratio for all taxpayers. The black (red) line shows this ratio subject to being included in the top 10% (1%).

Figure A.3 also presents the income ratio conditional on being in a top income group. It shows that within the top 10% or top 1% income earners, the ratio between incomes of men and women is close to 1, without a clear trend over time. In other words, there is no apparent income gender gap among high income earners. This result is seemingly unexpected given the large income gap overall. Yet, it is consistent with recent findings by Buzaglo-Baris (2023). Using matched employer-employee data, Buzaglo-Baris (2023) finds that "sorting of women into lower wage-premium firms [...] explains a significant part of the [gender] gap, while negligible part is due to within firm inequality".[11]

[11] We note that our analysis is based on reported tax income. If missing income, especially missing capital income, which is concentrated at the top of the distribution, is systematically concentrated more among men than among women, the assertion that there is no apparent income gender gap among high income earners will not be valid.

B Dividend Income and Other Capital Income

The primary data source for our analysis covers detailed information on the income distribution across all percentiles in Israel, categorized by income type. Dividend income is classified within a broader category termed *other capital income*, which includes not only dividends but also other forms of capital income that are subject to special tax rates, such as income derived from registered patents. To ensure that the inclusion of these additional income types does not compromise the validity of our analysis, we verify that their contributions are relatively minor compared to dividends.

For this purpose, we use data on the total reported dividends, as provided by the tax authorities from 2013 to 2020 (Raz-Dror and Yemini, 2024). These dividends are further disaggregated into those paid to individuals and those paid to other firms. Our analysis concentrates on individual dividends, as this subset is more directly comparable to the dataset employed in our study. A comparison between our dataset and the estimated total dividends paid to individuals by Raz-Dror and Yemini (2024) is presented in Figure B.1.

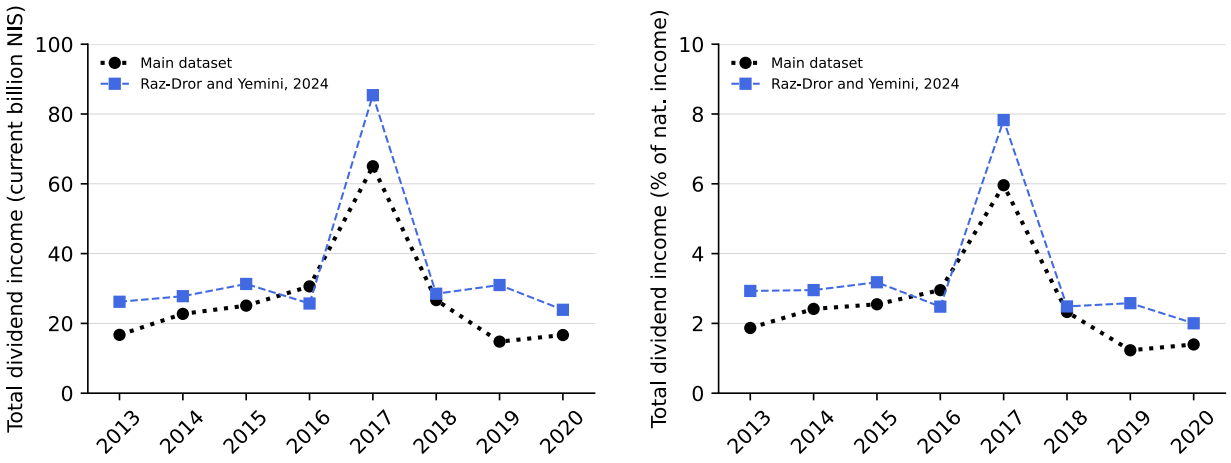

Figure B.1: Total dividend income, 2013–2020.

Notes: The left panel shows the total dividend income, or *other capital income* in our dataset (black) along with the total amount of dividend paid to individuals, as estimated by Raz-Dror and Yemini (2024). Values are in nominal billion NIS. The right panel shows the total dividend income as a share of national income in each year.

The two sources show some differences, with Raz-Dror and Yemini (2024) generally estimating amounts that are about 1 percentage point higher (in terms of national income) than those reflected in the tax data. This is even though their estimates exclude additional income components beyond dividends included in the main dataset. Notably, in 2017, this discrepancy is even more pronounced. This suggests that our estimates regarding the effect on

reporting are conservative. Moreover, the inequality estimates presented in our study might be understated, as an additional percentage point of national income, when distributed very unequally across the income distribution, is likely to result in greater inequality than what is indicated by our primary dataset.

C Top 1% and 90th Percentile Dividend Income

Figure 5 above shows the share of dividend income within the capital component of national income for both the top 1% and the 90th percentile. The data indicate that, following the 2017 reform, the dividend share for the top 1% declined significantly, while there was little change for the 90th percentile. Similarly, Figure C.1, which displays dividend income in real terms rather than as a share of capital income, shows the same pattern. The 2017 reform appears to have had no impact on the 90th percentile's dividend income, while it led to greater retained earnings among the top 1%.

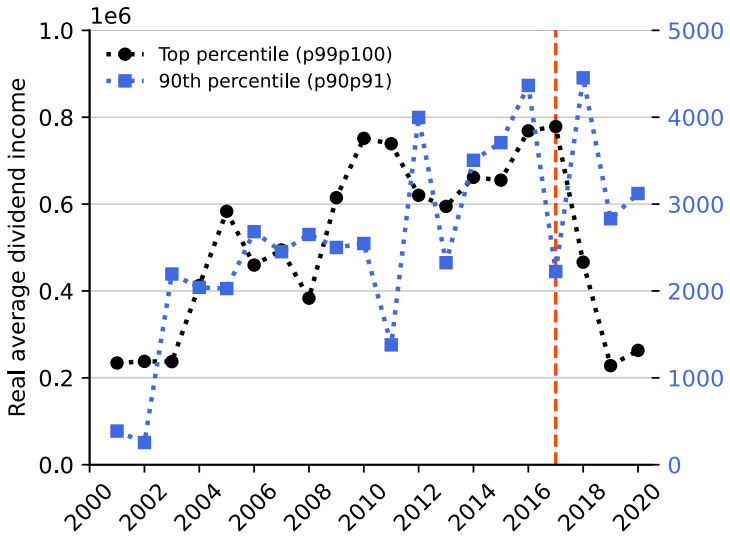

Figure C.1: Dividend income at the top of the income distribution, 2001–2020.

Notes: The left (black) y-axis shows the average real dividend income of the top 1% of earners, ranging from 0 to NIS 1 million (adjusted to 2021 values). The right (blue) y-axis shows the average real dividend income of individuals in the 90th percentile, ranging from 0 to NIS 5,000 (adjusted to 2021 values).

D Control Totals and Coverage

Table 3 details the control totals for income and population used in the paper. It also details the total identified income and taxpayer population in the data. It shows that the data cover typically 60% of national income. The missing income comes from both capital and labor income. For example, in the years of capital tax reforms, when dividend income was reported in larger amounts than before or after, the coverage is substantially higher compared to other years, especially in 2011.

Table 3: Control Totals and coverage

Year	Income total (Current billion NIS)			Population total (Thousands)		
	National income (WID, 2023)	Identified	Coverage	CBS, 2023	Taxpayers	Coverage
2001	447.5	280.4	62.7%	3990.7	2808.0	70.4%
2002	466.2	290.0	62.2%	4074.4	2902.6	71.2%
2003	465.2	295.8	63.6%	4153.8	2907.2	70.0%
2004	495.2	289.6	58.5%	4237.6	2937.7	69.3%
2005	532.1	314.6	59.1%	4321.4	2986.8	69.1%
2006	577.0	342.7	59.4%	4405.9	3165.2	71.8%
2007	617.6	363.6	58.9%	4489.2	3290.9	73.3%
2008	647.5	387.9	59.9%	4646.7	3371.7	72.6%
2009	675.1	404.2	59.9%	4730.2	3417.3	72.2%
2010	735.6	444.7	60.5%	4820.3	3555.0	73.8%
2011	784.4	510.3	65.1%	4905.2	3654.7	74.5%
2012	817.3	475.2	58.1%	4994.5	3602.5	72.1%
2013	894.2	476.6	53.3%	5086.2	3511.5	69.0%
2014	941.0	531.4	56.5%	5185.5	3840.8	74.1%
2015	984.7	578.4	58.7%	5286.0	4023.0	76.1%
2016	1036.2	615.2	59.4%	5385.4	4092.8	76.0%
2017	1091.2	679.8	62.3%	5489.7	4252.7	77.5%
2018	1146.4	679.3	59.3%	5597.1	4350.5	77.7%
2019	1201.6	674.4	56.3%	5711.9	4381.0	76.7%
2020	1193.2	672.3	56.1%	5814.8	4392.4	75.5%

The coverage in terms of population is better. The tax data cover 69%–78% of the adult population in Israel. The coverage has generally improved over time, indicating a growing share of taxpayers among adults. The missing population was added based on household survey data (see Section 4). Figure D.1 depicts the missing population in the tax data, as well as the missing income and missing labor income of the identified income. It shows that while the missing population is generally decreasing over time, indicating better coverage of the tax data, there is no clear trend in the share of missing total income or labor income (thus also no clear trend in missing capital income).

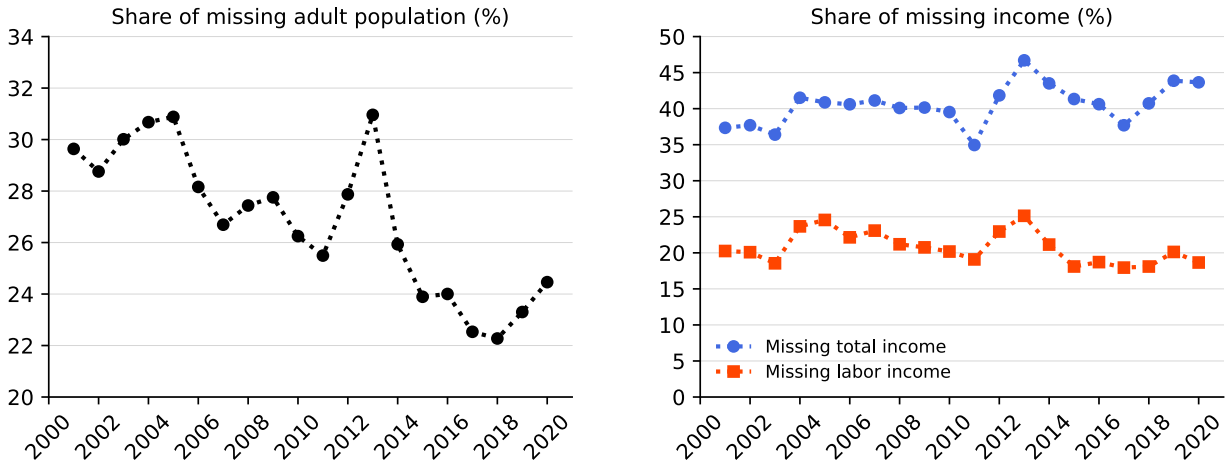

Figure D.1: Missing population and missing income, 2001–2020.

Notes: Left) The share of missing adult population in the tax data; Right) The share of missing national income in the identified total income (blue), and the share of missing labor income in the identified labor income.

E Comparison of Estimates to Other Sources

Figure E.1 presents a simple comparison of the results described above for the top 10% share in Israel to other sources. The other sources include two survey-based estimates, based on the Luxembourg Income Study (LIS, 2023) and the World Inequality Database (WID, 2023). These two series, despite being based on surveys, use different methodologies, and are very different from one another. The WID (2023) series involves many adjustments which tend to result in higher estimates of top shares, which indeed make the estimates closer to the DINA series presented above.

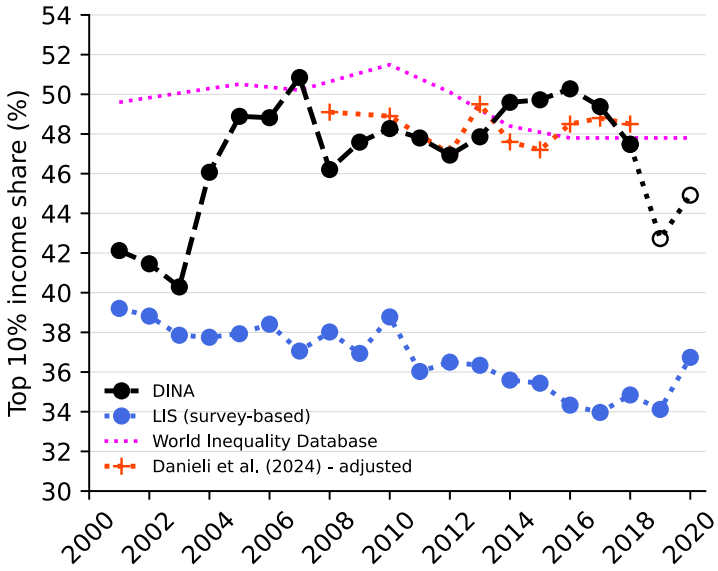

Figure E.1: The top 10% income share according to different sources.

Notes: This chart shows a comparison of top 10% share series for Israel taken from different sources: the Luxembourg Income Study (LIS, 2023); the World Inequality Database (WID, 2023); Danieli, Gilat and Leventer (2024). The DINA series uses different weights for 2019 and 2020 due to changes in household survey weights made in 2019 that affect the impact of adding missing population and missing income.

An additional series that is used for comparison is taken from Danieli, Gilat and Leventer (2024). Like the estimates in Figure 7 above, they are based on tax data. We chose the series in their paper that aims to account for all missing income and missing population. Therefore it might not come as a surprise that the results are fairly close in level and in the trend to the DINA series. This provides certainty in the estimates provided above.