IN SEARCH OF LOST TIME: AN ENSEMBLE OF POLICIES TO RESTORE FISCAL PROGRESSIVITY AND ADDRESS THE CLIMATE CHALLENGE

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ABSTRACT

The European Union needs to raise significant resources to finance a just green transition. At the same time, there is a widespread fiscal regressivity in many EU countries. Indeed, recent empirical evidence shows that the tax systems of many EU members are characterized by low degrees of progressivity, with high-income groups paying lower effective tax rates vis-á-vis middle- and low-income classes. In order to jointly tackle such issues, we propose an ensemble of tax policies at the EU level grounded on the recent proposals advanced in the literature. This fiscal reform includes a wealth tax targeting the top 1% of wealth holders, a tax on unrealized capital gains, and an increase of the minimum corporate tax. Our first estimates suggest that these measures can generate substantial yearly revenues in the order of 1,9%-2,9% of EU GDP. Such resources can contribute to the funding of the additional climate mitigation and adaptation policies required to tackle the climate emergency, while reducing inequality, thus contributing to put EU economies on sustainable and inclusive growth pathways.

KEYWORDS: Taxation; Inequality, Wealth tax, Capital gains tax, Corporate tax, Climate change.

JEL: D31, H2, H5.

In search of lost time: An ensemble of policies to restore fiscal progressivity and address the climate challenge*

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Abstract

The European Union needs to raise significant resources to finance a just green transition. At the same time, there is a widespread fiscal regressivity in many EU countries. Indeed, recent empirical evidence shows that the tax systems of many EU members are characterized by low degrees of progressivity, with high-income groups paying lower effective tax rates vis-á-vis middle- and low-income classes. In order to jointly tackle such issues, we propose an ensemble of tax policies at the EU level grounded on the recent proposals advanced in the literature. This fiscal reform includes a wealth tax targeting the top 1% of wealth holders, a tax on unrealized capital gains, and an increase of the minimum corporate tax. Our first estimates suggest that these measures can generate substantial yearly revenues in the order of 1.9%-2.9% of EU GDP. Such resources can contribute to the funding of the additional climate mitigation and adaptation policies required to tackle the climate emergency, while reducing inequality, thus contributing to put EU economies on sustainable and inclusive growth pathways.

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1 Introduction

The last decades have witnessed trends of increasing income and wealth inequality in most countries of the European Union (EU), accompanied by sluggish growth (Piketty, 2014; Blanchet et al., 2022; Guzzardi et al., 2022; Blanchet and Martínez-Toledano, 2023). Such concentration of income and wealth is favoured by inequitable tax systems (Roine et al., 2009; Rubolino and Waldenström, 2020). Indeed, not only top income tax rates have progressively fallen, but the globalized economic system has allowed for the existence of several loopholes at the disposal of multinationals and billionaires to move their capital and elude taxation (Zucman, 2014). This has resulted in an international race to the bottom which has further reduced tax rates for corporate and personal income.

At the same time, the tall societal challenges of climate change require large amounts of resources to finance mitigation and adaptation policies. Indeed, the European Union has committed to the ambitious goals to cut its greenhouse gasses (GHG) emissions by at least 55% by 2030. Moreover, the costs of climate-change impacts and mitigation policies are unequally distributed across the population (Markkanen and Anger-Kraavi, 2019; Taconet et al., 2020), hitting more those in the bottom part of the income distribution. At the same time, the most affluent individuals are responsible for the bulk of the emissions in high-income countries (Chancel, 2022). Therefore, inequality and climate change need to be jointly addressed.

In this work, we first assess how taxation has evolved over the recent decades in developed countries and how it has impacted inequality trends. What emerges is that the degree of progressivity of tax systems has decreased so much that in the US and in EU countries for which evidence exists, the richest part of society pays lower effective tax rates than the rest of the population. The tax system of the US and of many EU countries has thus become *regressive*.

We then present some policy proposals advanced in the literature to restore the progressivity of the tax systems. More specifically, we consider a package of fiscal interventions which can be introduced in the European Union, namely an EU-wide wealth tax, a taxation scheme for unrealized capital gains, and different tools to increase corporate taxation. We discuss how the potential issues related to their implementation can be addressed. Our first estimates show that the proposed tax reform could considerable boost EU tax revenues in the order of 1.9%-2.9% of EU GDP in 2022. Moreover, our tax reform would reduce income and wealth inequality as each of the proposed measures is able to increase fiscal revenues by taxing the richest individuals of the income distribution without affecting the rest of the population.

By restoring the lost progressivity of their fiscal system, EU governments could reap

the necessary resources needed to tackle the climate emergency. We find that the revenues generated by our fiscal package can finance the EU mitigation and adaptation policies, while increasing the fiscal burden for the top part of the income distribution, which is responsible for most of EU GHG emissions (Chancel, 2022).

The rest of the work is organized as follows: Section 2 considers recent empirical evidence regarding the progressivity of the tax system in various countries. Section 3 examines three primary proposals at the European level to reinstate the lost progressivity of the fiscal system and fund policies for a fair green transition. These proposals include a wealth tax focused on the wealthiest individuals (Section 3.1), a capital gains tax (Section 3.2), and a minimum corporate tax (Section 3.3). Section 4 discusses how the additional resources collected at the EU level can finance a fair transition towards a greener economy, and, lastly, section 5 concludes the discussion.

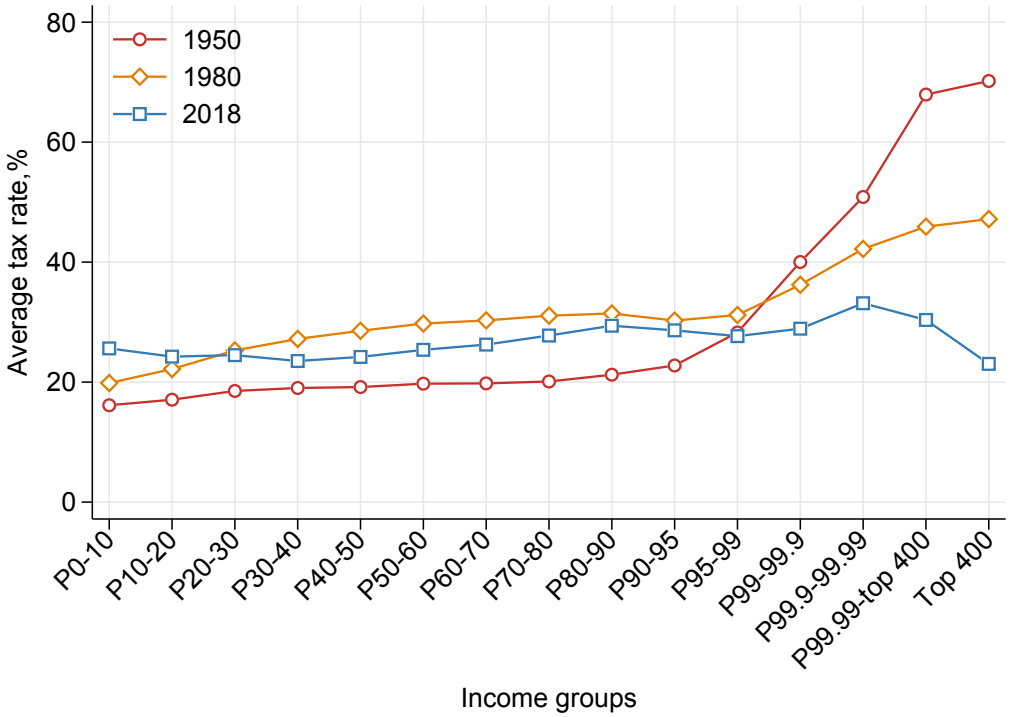
2 Recent worrying trends in tax progressivity

Tax progressivity has been decreasing since the 1980s in most regions of the world, although with country specificities. Such a trend is largely due to lower taxes at higher income levels (Peter et al., 2010) and this is particularly relevant for advanced countries (Bozio et al., 2018; Saez and Zucman, 2019b; Bruil et al., 2022; Guzzardi et al., 2022). In the US, Saez and Zucman (2019b) estimate tax incidence on the whole income distribution and find that the effective tax rate (obtained by jointly considering different categories of taxes) was steeply progressive in the 1950s, but it has turned into a flat tax over the income distribution with regressive rates for the richest 0.01% in 2018. Figure 1 depicts average tax rates for different income groups for the United States employing data from Saez and Zucman (2020). It strikingly shows the freefall in progressivity at the top of the income distribution, with the Top 400 of income earners decreasing their tax rate from around 70% in 1950 to just above 20% in 1980. Moreover, the figure shows that the regressivity at the very top of the distribution is a recent phenomenon stemming from specific policy choices.

Both in France (Bozio et al., 2018) and in the Netherlands (Bruil et al., 2022), there is evidence for a regressive tax system at the top of the income distribution, with the top 1% paying lower effective tax rates than individuals at lower percentiles. In Italy this regressivity starts at the 95th percentile (Guzzardi et al., 2022), with overall tax rates estimated to fall from a peak of 50% to 35% for the richest individuals (see Figure 2).

These results are driven by the composition of income and the related degree of progressivity of taxes on different incomes. First, capital incomes are more heavily concentrated at the top of the distribution, and these are mainly taxed at flat rates. Second, consumption taxes have a regressive impact as they are paid in higher proportions at the bottom and

Figure 1: Average tax rates by income group in the United States



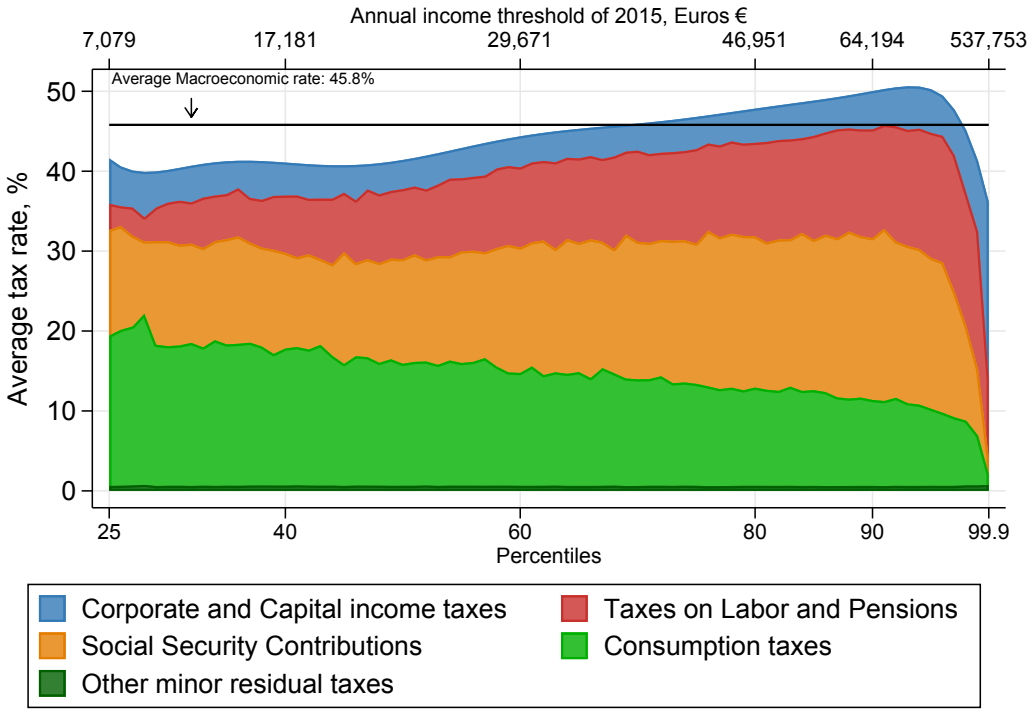
Notes: Data are from Saez and Zucman (2020). P0-10 on the x-axis stands for the income group from percentile 0 to percentile 10. Analogously for other income groups.

middle of the distribution. Third, the progressivity of the personal income tax is not *progressive enough* to compensate for flat components of the fiscal system, which empirically result as regressive. Indeed, in the case of Italy, Figure 2 shows that although taxes on labour and pensions are mostly progressive, flat consumption taxes are de facto regressive, as propensities to consume are higher at the bottom of the income distribution, in line with empirical findings on consumption (Dynan et al., 2004; Jappelli and Pistaferri, 2014; Saez and Zucman, 2016; Bunn et al., 2018).

The aforementioned trends are the result of decades of regressive tax reforms. First, the personal income tax, the main source of progressivity in the tax system, has been continuously revised by decreasing the number of tax brackets (Fitoussi and Saraceno, 2010) and by reducing top marginal tax rates (Piketty, 2014; Piketty et al., 2014), as shown in Figure 3 for ten high-income countries. This trend has not been reversed even if recent research contributions have shown that higher top marginal tax rates are desirable. Indeed, in an optimal taxation framework, the top tax rate in the US and UK could exceed 80% without harming growth, while maximizing government tax revenues (Piketty et al., 2014, see also a related VoxEU column). This reinforces the evidence on the Laffer curve, which

finds a revenue-maximizing tax rate around 70% (Trabandt and Uhlig, 2011).

Figure 2: Average tax rate by income percentiles in Italy, 2015



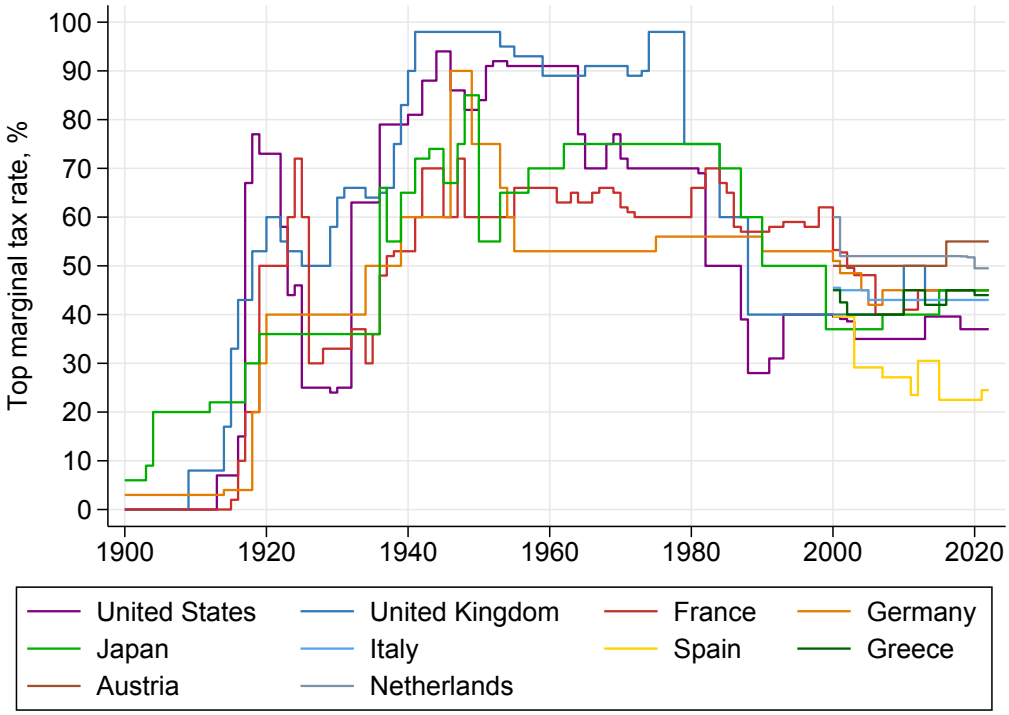
Notes: Data are from Guzzardi et al. (2022).

Second, taxation has increasingly shifted from capital to labour. Several countries have introduced the Dual Income Taxation (DIT) system, which implies a lower and less progressive (often flat) tax rate on capital incomes, while keeping progressive taxes on labour (see, e.g., the case of Nordic countries in the beginning of the 1990s, Sørensen, 1994; Iacono and Palagi, 2022). Furthermore, globalization has increasingly provided corporations with opportunities to move their profits to countries with lower tax rates (Zucman, 2014), thus incentivizing an international race to the bottom for corporate taxation.

What have been the economic impacts of the falling progressivity of the tax system? Lower progressivity has certainly been a major factor explaining the rising inequality trends, especially by boosting top income shares (Roine et al., 2009; Jaumotte and Osorio Buitron, 2020). Indeed, the tax reforms of the 1980s and early 1990s implemented in Western countries have particularly fattened income shares for the richest 1%, with top marginal tax rates cuts accounting for a large part of the impact (Rubolino and Waldenström, 2020).

One could argue that increasing levels of inequality are not a problem as by spurring growth they trickle down to the whole income distribution. However, a burgeoning evi-

Figure 3: Top marginal tax rates over time



Notes: Data before 2000 are from Piketty (2014) and Chancel et al. (2017). After 2000 data are collected from OECD Tax Database: dataset Table I.7. Top statutory personal income tax rates.

dence unequivocally shows that this is not the case. Hope and Limberg (2022) find that tax cuts do not trigger higher levels of economic activity which percolate to the poor and middle classes. Instead, tax cuts lead to higher income growth for the rich. Shifting the focus from households to firms does not alter the general conclusion. With a meta-analysis of the existing literature, Gechert and Heimberger (2022) show that also corporate tax cuts do not boost economic growth. At the opposite side, recent studies find that lower levels of inequality are associated to longer growth spells and that redistribution does not harm growth (Dabla-Norris et al., 2015; Berg et al., 2018). Moreover, lower inequality is also associated to higher wellbeing and improved health conditions (Pickett and Wilkinson, 2010). Therefore, the evidence seems to point more towards *trickle-up* mechanisms (Palagi et al., 2021), with income growth at the bottom of the distribution benefiting also richer strands of society.

If lowering top tax rates does not spur growth (while increasing inequality), it certainly increases the risk of mounting public deficits due to the introduction of flat taxes. One emblematic episode highlighting the public financial risks given by a flattening of the tax system is the steep rise in the cost of government debt which followed the announcement

by Liz Truss' government in the UK of a massive tax cut, including a reduction of the top income tax rate (see e.g. the analysis by the Institute for Fiscal Studies). Indeed, even major institutions such as the International Monetary Fund have recently advocated for policies restoring the degree of progressivity, by taxing the rich, as a way to increase revenues in countries with large debt stocks (Fund, 2020). The latter policy guidelines are in line with the previously mentioned theoretical work indicating that relatively high top tax rates have a large revenue potential (Trabandt and Uhlig, 2011; Diamond and Saez, 2011; Piketty et al., 2014).

The evidence presented in this section clearly shows that the last decades have been characterized by a sequence of policies decreasing tax progressivity. Such policies have exacerbated inequality without spurring growth or employment. Moreover, lower progressivity has implied significant losses in terms of tax revenues for government spending, thus reinforcing adverse impacts on disparities, possibly defunding pre-distribution policies (e.g. health and education). In the next section we will analyze some major policy proposals that could allow to restore higher levels of tax progressivity.

3 Turning the tide: policy tools to increase tax progressivity

In this section we will discuss some main proposals advanced nowadays to restore the progressivity of the tax system. We will first focus on the personal and household dimension by surveying the state of the art about wealth taxation (Section 3.1), and capital gains taxation (Section 3.2). We will then consider corporate taxation (Section 3.3).

3.1 Wealth tax

There is a blossoming research line on wealth taxation which tries to assess its impact and account for the challenges in its effective implementation. A wealth tax mainly levied on the richest part (e.g. the top 5%) of the wealth distribution could increase the progressivity of the overall tax system (see e.g. Guzzardi et al., 2022, for a simulation on the Italian case). However, several key arguments against a wealth tax have already emerged.

One major concern is the issue of tax evasion. Wealth is indeed a mobile asset, and, even in the case of real estate, it can be relatively easy to sell and move investments to new locations. Individuals could then move from a country with a wealth tax to another country after selling their assets in order to avoid taxation. One potential solution to this problem would be to apply wealth taxes according to a person's residence, rather than on the location of her wealth. Even in this case, wealthy individuals can choose to relocate and change their residence. This in turn may lead to a loss in total wealth for countries

introducing a wealth tax in favour of neighbouring countries which do not tax assets. This scenario has been highlighted in a recent article from The Guardian that sheds light on the responses of Norwegian billionaires to a recent increase in the wealth tax. Many billionaires, indeed, left the country to avoid the wealth tax. However, at the time of writing, official data regarding the impact of these relocations on the total revenue generated by the Norwegian wealth tax are not yet accessible. On this topic, although there is a lack of comprehensive evidence taking into account the whole population and a large number of countries, the available empirical research shows that massive relocations of individuals between countries are rare (Kleven et al., 2020). Also in the case of France, the switch from the *Impôt de solidarité sur la fortune* (ISF) to the *Impôt sur la fortune immobilière* (IFI) had a negligible impact on the relocation of individuals abroad, although it affected the distribution of corporate dividends (Bach et al., 2021).[1] In any case, to minimize the risk of tax elusion, an EU-wide wealth tax common to all countries would be highly desiderable, as proposed by Piketty (2021)[2] and Landais et al. (2020), as it would considerably discourage any potential relocation of assets or residence, and it would facilitate the introduction of common anti-avoidance rules, such as exit taxes.

Wealth taxes may also be avoided via portfolio adjustments through which individuals may reallocate their wealth towards assets that are not subject to taxation (see Duran-Cabré et al., 2019; Bastani and Waldenström, 2020; Advani and Tarrant, 2021; Saez and Zucman, 2022b). Such an issue, however, is particularly relevant only when the legislation on wealth tax allows for many tax-exempt assets and different tax rates. This is what has happened in Spain, where Duran-Cabré et al. (2019) find that higher tax rates have induced individuals to significant shifts in their portfolios to reduce the taxable wealth with limited savings effects, and tiny impact on total net wealth. As suggested by Saez and Zucman (2019a), the solution to this issue is relatively straightforward: the tax base needs to include all net wealth, thus ruling out any opportunity of portfolio adjustments to avoid taxation. This implies that a wealth tax levied on total net wealth is preferable to fragmented property taxes. Nevertheless, evasion may still occur if wealth has to be self-reported as in the case of Switzerland where "half of the apparent wealth accumulation following the tax cut" is explained by "self-reporting of previously hidden assets" (Brülhart et al., 2022). Therefore, relying on third-party valuation is crucial to ensure accurate reporting, improve the accuracy of net wealth assessments, and effectively implement wealth taxes, as extensively suggested by the OECD Tax Policy Studies (OECD, 2018) and by several scholars (for a review see Advani and Tarrant, 2021).

[1] Individuals can relocate their assets within the same country: in Switzerland, tax payers tend to move from cantons with higher wealth taxes to those with lower marginal rates (Brülhart et al., 2022).

[2] See also this column by Piketty on Le Monde on the need of a wealth tax to fight climate change.

The last problem concerns the presence of liquidity constraints that some individuals may face with a wealth tax. This is particularly relevant if non-income generating assets are part of the wealth that is taxed. However, this issue can be solved by allowing for deferred tax payments as suggested by OECD (2018). This would ensure that people with unexpected liquidity constraints could postpone their tax payment. Nevertheless, taxing wealth could also induce a more productive use of assets (Guvenen et al., 2023), as individuals would have a greater incentive to use their wealth to generate income to cover their tax obligations or to sell it. This would lead to a reallocation of wealth toward more productive activities, possibly increasing economic growth over time.

After having discussed the possible weaknesses related to the introduction of a wealth tax, we can quickly estimate the potential tax revenues stemming from its introduction in the European Union. In order to obtain estimates on a comprehensive wealth tax, we start from total private net wealth including tax-exempt assets.[3] Using estimates of wealth distribution for the European Union from WID.world (Bajard et al., 2021), we can make a first assessment of different types of wealth tax. For example, levying a 1% tax rate on the top 1%—who own at least €1.5 million in 2021 and hold 25% of total EU personal wealth—would generate approximately 0.6% of EU Gross Domestic Product (GDP) each year assuming a 15% evasion rate. In a more progressive scenario, wealth tax revenues might increase dramatically: for example, a 2% marginal rate for the top 0.1% and an additional 3% marginal rate for the 300 billionaires resident in the EU (Forbes 2022 list) could generate an annual revenue of 1% of EU GDP (see the estimates provided by Landais et al., 2020 and Kapeller et al., 2021). How the tax revenues from wealth would be employed for alternative scopes and shared across EU states would be a political choice.

Overall, we believe that the different issues analyzed in this section should not be viewed as a motivation to dismiss the introduction of a EU-level wealth tax, as there are effective ways to solve them. Therefore, an EU-level progressive wealth tax could be an effective solution for regaining the lost tax progressivity, while raising significant resources which could be used to tackle societal challenges such as climate change (cf. Section 4). Many European countries have already introduced the wealth tax in their fiscal system (i.e., Austria, Denmark, France, Finland, Norway, and Switzerland; cf. Sandford, 1988; OECD, 2018). Moreover, a wealth tax on the richest 1% of the population could be backed by the majority of the population, as survey evidence shows political support for a wealth tax on millionaires (Fabre et al., 2023).

[3]Indeed, a re-assessment of which assets should be subject to the tax (ideally all) would be useful when practically designing a wealth tax. One key mistake which was done at the eve of the introduction of the wealth tax in France in 1981 was not to have a comprehensive tax base and to allow for various exemptions (Verbit, 1991).

3.2 Capital gains tax

One of the main reasons for the increase in inequalities and for the regressivity of tax systems for the top income shares discussed in Section 2 stems from the relevant role of financial income in the earnings of the most affluent people. A well-tailored capital gains tax is an effective option for increasing the fiscal burden for the richest individuals in the income distribution, partially reversing the loss of progressivity of the tax system. However, despite such potential benefits, a reform of capital gains taxation is not sufficiently debated in the European Union.

How does a capital gains tax work? The tax is levied on the profits obtained from the sale of various assets, including stocks, real estate, business shares, artworks, etc. The tax is calculated considering the difference between the purchase ("basis") price and the sale price of the asset. For instance, if one buys a stock for €1,000 and sells it for €2,500, the resulting capital gain of €1,500 will be taxed. In principle, this form of taxation should not introduce biases in reporting and it should be impossible to evade, as it would be triggered every time assets are transferred.

There are two main problems related to capital gains taxation in Europe. The first one stems from the significant disparity in tax rates across EU countries. For instance, in Germany the capital gains tax is 0% for real estate property, while a flat tax of 26.3% is levied on other ones. In Spain, the capital gains tax is progressive, but the top marginal rate is 26%, well below the top one for labour income. In Italy, the flat capital gains tax is set at 26% (with a lower rate of 12.5% for certain assets). In France it is 36.2%, but the rate shrinks with the possession time of the underlying asset. The Netherlands has a 0% capital gains tax on all types of assets. More broadly, the average rate of capital gains tax in 123 countries is 18% (Christensen et al., 2023). There is then an urgent need for proposals to align capital gains taxation with the one on labour, increasing the former to restore the progressivity of the tax system. As capital gains are primarily concentrated among the wealthiest segments of the population (Advani and Summers, 2020), higher tax rates would have the most significant impact on the richest individuals, thus reducing inequality.

The second problem arises when individuals are allowed to postpone their capital gains tax payments indefinitely by retaining the asset until their death and then transferring it through inheritance or gifts (Nanda and Parkes, 2019). This is the case in many European countries (Austria, Estonia, Germany, Ireland, Italy, Luxembourg and Sweden, cf. OECD, 2021a) adopting a "carry-over" rule, which transfers the basis value to inheritors. Especially in the case of the ultra-wealthy, such a rule can considerably reduce the tax revenues, as subsequent generations can defer their capital gains indefinitely, thus avoiding the payment of the tax. The situation is even worse for the European countries (France, Hungary, Latvia,

Lithuania, Portugal, Slovenia and Spain, cf. OECD, 2021a) where the law provides for a "step-up in basis", which resets an asset's basis value to the level at the time of the death of the owner, thus drying the possible revenues of the capital gains tax.[4] Uniform rules across EU countries are also required to fix the issue of indefinite postponing of capital gains realization. A standardized EU rule that imposes the payment of capital gains taxes at the time of the owner's death would not only deter indefinite deferment, asset and individual relocation to evade taxation, but it would also generate significant tax revenues. Such a taxation on unrealized capital gains would be particularly useful for increasing the effective tax rate paid by the very wealthy, who use their stock of wealth as collateral to finance their spending by borrowing (Eisinger et al., 2021).

How much revenues could a tax on unrealized capital gains generate? In the US, a study by Oxfam (Christensen et al., 2023) shows that the potential revenues from a 20% one-off tax on unrealized capital gains for the five richest individuals in the period 2017-2022 would raise approximately $51 billion. A similar exercise was conducted by Saez et al. (2021), who estimated that a one-time tax of approximately 40% on the accumulated stocks of unrealized capital gains of around one thousands US bilionaires would raise $1000 billion. Such a tax could complement increased rates on realized capital gains, as proposed by Saez and Zucman (2021).

We performed similar calculations for the European Union. According to the Forbes (2022) list, there are about three hundred billionaires in the EU in 2022, a substantially lower number than in the US. In line with the results of Saez et al. (2021), we conservatively assume that half of the wealth of EU is made of unrealized capital gains,[5] estimating €792 billion of taxable wealth. Applying a tax rate of 26% as commonly done for *realized* capital gains in many countries, the total tax revenues would amount to €205 billion. Moreover, with a higher tax rate of 40% aligned with those on income, tax revenues could grow up to €316 billion.

In order to implement such a proposal, one could introduce a permanent tax on unrealized capital gains over a five year period (in line with Saez et al., 2021) for the richest individuals above a certain wealth threshold, possibly the top 1%. In this way one could wipe out the incentive to indefinitely postpone capital gains realization and ensure a more stable source of revenue for the EU governments. Additionally, since capital gains would be considered realized every five years, any additional gains accrued in the following period would only be taxed on the incremental value, thus avoiding double taxation.[6]

[4] In addition, a third category of countries, i.e. Denmark and Finland, implements both a "carry-over" rule or a "step-up in basis" depending on the nature of assets.

[5] Saez et al. (2021) find that in the US the share of unrealized capital gains increases with wealth. We assume a constant share.

[6] Double taxation has often been raised as a potential issue in the discussion of taxing capital gains and

Based on such assumptions, we perform a basic simulation exercise using WID.world data (Bajard et al., 2021), focusing on the wealthiest 1% in the European Union, who own a total wealth of €16,600 billion. We conservatively assume an average real wealth growth rate of 9.4%, half of those observed over the past 5 years. Moreover, we consider that only half of this growth is due to unrealized gains, obtaining a real appreciation of wealth equal to 4.7%. We find that €780 billion of unrealized capital gains could be subject to the new tax, obtaining extra revenues of approximately €312 billion, which would imply a yearly average of €62 billion. Note that such a tax would amount to an annual average of merely 0.3% of the entire wealth of the top 1%.

The proposed capital gains tax should not be perceived as a radical fiscal policy. As the capital gains tax already exists in many EU countries, it only needs to be aligned with the marginal tax rates on labour income for those belonging to the top 1% of the wealth distribution. Moreover, the proposal is in tune with the Biden administration's plan to implement an annual tax on unrealized capital gains for the top 0.01% in the US wealth distribution. The new capital gains tax could effectively increase revenues while reducing wealth inequality by ensuring that the ultra-wealthy pay their fair share of taxes.

3.3 Corporate tax

Corporate taxation is a field of intervention that has recently regained attention. In October 2021 more than 130 countries signed an agreement to implement a 15% minimum tax on multinational profits (OECD, 2021b). Although this is a significant first step, the proposal has raised several criticisms as it entails a low tax rate (Saez and Zucman, 2022a), much below effective rates paid by the majority of households in developed countries (Bozio et al., 2018; Saez and Zucman, 2019b; Guzzardi et al., 2022; Bruil et al., 2022). Moreover, low- and middle-income countries (LMICs) have criticized the measure as it will result in an inequitable transfer of revenues to high-income countries in which multinationals' headquarters are based (Chancel et al., 2023).

Despite such criticisms, the European Union would benefit from this measure. Indeed, many studies collected by the EU-Tax Observatory have estimated significant revenue losses at the EU level due to profit shifting. More specifically, the European Union has incurred in yearly tax revenue losses due to profit shifting ranging from a minimum of €15 billion (Janskỳ and Palanskỳ, 2019) to a maximum of €40 billion (Tørsløv et al., 2023), while Cobham and Janskỳ (2018), Garcia-Bernardo and Janskỳ (2022), and Álvarez-Martínez et al. (2022) estimate a total revenue loss of approximately €35 billion per annum.

dividends at the same rates as other income sources. Notice, however, that double taxation is not uncommon in tax systems. For example, people are subject to VAT taxes on their consumption after having paid income taxes (Nanda and Parkes, 2019).

A minimum effective corporate tax is advantageous from at least two perspectives. First, it would promote fair competition as lower tax rates for multinational enterprises (MNEs) compared to local firms could create an unjust advantage for large corporations. Second, implementing a global minimum tax rate rule would enhance income redistribution and progressivity, as corporate tax is a tax on corporate profits, a highly concentrated source of income and de facto a minimum tax on the affluent. By implementing this policy, governments can ensure that MNEs and wealthy individuals pay their fair share of taxes, promoting a more equitable distribution of income.

Research by the EU-Tax Observatory (Barake et al., 2021) shows that the introduction of a 15% minimum tax in the EU could generate additional revenues of €90 billion (in 2022 euros); at 21%, it could provide €179 billion; at 25%, the rate advocated by the Independent Commission for the Reform of International Corporate Taxation (ICRICT), €255 billion. The revenue potential is therefore significant. The EU Council have agreed to adopt the 15% global minimum effective tax rate in the European Union and the Directive that implements it will become effective from January 2024. Decisions on tax matters require unanimity in the EU council, giving countries that have historically attracted significant profits of MNEs by offering low effective tax rates (e.g. Ireland, Hungary, Poland, Netherlands) a power to veto decisions. Moving to a higher rate could therefore be challenging, but this may occur if other countries (e.g. in primis the United States) increase their minimum tax rate above 15%, as this could induce EU members to follow to avoid to loose tax revenues.

Several proposals have been put forth complementing the 15% minimum tax on multinational profits. As especially in high tech sectors concentration is high and market power boosts corporate value, Saez and Zucman (2022a) propose to institute a 0.2% tax on corporations' stock shares for all publicly listed companies and large private companies headquartered in G20 countries. This measure would both have a high revenue potential, as it could raise 0.2% of world GDP each year, and it would be progressive, as stock ownership is highly unequally distributed. The authors also underline that liquidity would not be an issue as the tax could be paid in kind by issuing new stock.

A further corporate tax measure is to tax excess profits (Chancel et al., 2023). The high inflation, particularly driven by energy prices, is going hand in hand with larger profits (see e.g. the evidence provided by the European Central Bank), while households especially at the bottom of national income distributions tend to be severely affected by increases in prices (Edelstein and Kilian, 2009, see also the analysis carried out by Bruegel). All these factors lay the ground for justifying a tax on excess profits. Of course, the threat of profit shifting should be kept in mind while designing such a proposal (Hebous et al., 2022), which requires as usual harmonization among countries. In recent years, many countries have implemented windfall profit taxes, either independently, like in Italy or Spain, or

Table 1: Yearly tax revenue estimates

	in billion €	in % of 2022 EU GDP
Wealth tax	155	1%
Capital gains tax	62	0.4%
Corporate tax (15%-25%)	90-255	0.5%-1.5%
Totals (yearly)	307-472	1.9-2.9%

Authors' estimations for the wealth tax and capital gains tax are based on wid.world data; corporate tax estimates are based on the EU Tax Observatory data collection https://www.taxobservatory.eu/repository/the-scale-of-corporate-tax-avoidance/. Tax revenues are reported if additional to the current system. See Section 3 for details on the different measures. Recall that, although the unrealized capital gains tax is levied over a period of 5 years, we here report the corresponding yearly value (see Section 3.2). Also, note that we do not report additional revenues that could be raised through a comprehensive tax on windfall profits due to the lack of estimates (see Section 3.3).

in a coordinated manner in the EU. Indeed, in 2022, the Council of the European Union reached a consensus to apply an EU-wide windfall profit tax on fossil fuel companies. The purpose of this tax is to generate funds to support households and businesses grappling with high energy prices. Windfall profits are defined as profits surpassing 120% of the reference period, which is determined as the average profit from 2018 to 2021. These excess profits are subject to a minimum tax rate of 33%. Considering that windfall profits have been observed in sectors other than energy, such as pharmaceuticals, food, banking, and military, there is a great potential to expand the excess profit tax to such relevant industries on a permanent basis.

4 Tax progressivity for a just green transition

Given the increasing level of inequality and the regressivity of the tax system in many countries (cf. Section 2), increasing tax progressivity should be an objective for a well-functioning society. A more progressive tax system could also provide the European Union with relevant resources to tackle societal challenges (as also discussed in the "Manifesto for the democratization of Europe"). The revenue potential of introducing EU taxes on wealth and unrealized capital gains, as well as to rise the minimum corporate tax rate to 25% would amount to $472 billion corresponding to 2.9% of EU GDP (cf. Table 1).

Although these are quick estimates and the actual implementation of such policies would require a careful thought on the different limitations, our analysis shows that there is huge potential of collecting additional resources to tackle urgent societal challenges. Once a political consensus is achieved, the best design of taxes to increase the progressivity

becomes a technical matter. And such a consensus could be supported by large parts of the population who is in favour of a wealth tax on millionaires, also for financing low income countries and climate change policies (Fabre et al., 2023).

The most pressing societal challenge faced by the European Union is climate change, which calls for both mitigation policies to cut greenhouse gas (GHG) emissions and adaptation strategies to protect EU citizens from the impact of global warming. Let us first consider the cost of mitigation policies, as well as their potential impact on inequality. With the Fit for 55 package, the European Union has committed to the ambitious goal of reducing EU emissions by at least 55% by 2030. Although decarbonization and the green transition entail new economic opportunities, they also come with costs. The IPCC's Sixth Assessment Report shows indeed a large gap in the average annual mitigation investment needs as the actual average flows need to double to reach the minimum levels required for mitigation policies, with the gap in Europe amounting to almost €230 billion yearly at minimum.[7] Moreover, the impact of mitigation policies on inequality is asymmetric (Markkanen and Anger-Kraavi, 2019; Taconet et al., 2020). Carbon taxes are indeed typically regressive, hitting more the poorest income classes, possibly triggering social protests as in the case of French *Gillets Jaunes*.

Even if Europe meets GHG emissions reduction targets, the temperature will increase at least to +1.5 °C, further strengthening the already sizeable impacts of climate change on production and inequality (Burke et al., 2015; Coronese et al., 2019; Diffenbaugh and Burke, 2019; Palagi et al., 2022). This is why adaptation measures are urgently needed. In Europe estimates of adaptation investment needs range between €35 and €200 billion per year (see the recent review by the European Environment Agency). Such a range of investment is extremely wide, as estimates depend both on the extent of implemented mitigation strategies and on the large uncertainty of climate impacts on our economies.[8] The cost of climate impacts are unevenly distributed across the income distribution as more affluent individuals have more resources to shield themselves from extreme natural events. Moreover, potential inequality issues could arise also between EU countries given that the Mediterranean region is a particularly fragile area in terms of expected damages from extreme climate events (Coronese et al., 2019; Palagi et al., 2022).

Our proposed reforms to increase the progressivity of the EU tax system could provide the required resources to finance both mitigation and adaptation policies, while reducing inequality. According to our estimations in Section 3.1, the EU wealth tax could provide resources to fill most of the EU mitigation financing gap. The rest of resources could be

[7] For further details see Figure 4.6 in the IPCC AR6 synthesis report, available at this link.

[8] For similar estimates referring to high-income countries see Stern and Stiglitz (2023). They find that adaptation and resilience spending must increase from $52 billion in 2019 to a target of $327 billion in 2030 in order to be consistent with a pathway to net-zero emissions by 2050.

provided by the unrealized capital gains tax and the 25% EU corporate tax which could finance also EU adaptation needs. Finally, the residual revenues could be channeled to middle- and low-income countries via the the loss and damage fund created during the COP27 in Sharm el-Sheik.[9]

To conclude, as climate change and inequality are two self-reinforcing phenomena, with climate change disproportionately affecting the poor (Diffenbaugh and Burke, 2019; Palagi et al., 2022), and the global richest being responsible for the bulk of emissions (Chancel, 2022), introducing a progressive tax system appears a timely and necessary block of the EU climate policy agenda.

5 Conclusions

In this work, we have provided evidence on the evolution and distribution of the fiscal burden in advanced countries focusing on the European Union. The evidence shows that the degree of progressivity of tax systems has sunk so much that the richest income classes are paying lower effective tax rates than bottom- and middle-income groups. This lost progressivity, is enlarging disparities with no discernible effect on growth or employment.

We have then discussed how to restore some degree of the lost progressivity by passing an EU-wide tax reform encompassing a wealth tax levied on the richest 1% of the population, a tax on unrealized capital gains, and a substantial increase of the minimum tax on corporate profits. Our first estimates show that the revenues generated by such fiscal intervention are substantial. More specifically, a EU wealth tax could generate resources amounting to 1% of EU's GDP. A tax on unrealized capital gains over the past 5 years would allow the EU to collect almost 2% of its GDP (0.4% yearly). Finally, an EU-level minimum corporate tax ranging between 15% and 25% could generate additional revenues corresponding to 0.5% and 1.5% of EU GDP.

Such a fresh flow of resources could be employed to finance both the mitigation and adaptation policies required to tackle the climate emergency. In this way, our package of fiscal interventions would allow EU countries to jointly reduce inequality, increase the fairness of their tax system, cutting greenhouse gases emissions and dampening the social impact of extreme climate events. The proposed tax reform could then contribute to put EU economies on a sustainable and inclusive pathway.

This work is just the first step in designing a fairer and climate-friendly tax system for the European Union. A complete assessment of the impact and revenue potential of the fiscal policy tools here considered require additional work. First, an extensive sensitivity analysis

[9]Chancel et al. (2023) show that a 1.5% global wealth tax on individuals with net wealth over 100 million would be sufficient to cover the estimated adaptation funding needs of middle- and low-income countries.

must be carried out on the estimated revenues, by varying the underlying assumptions. Second, additional analyses must be performed to assess the possible capital outflow triggered by EU-level fiscal policies. Nevertheless, given the regressivity of the current EU fiscal systems, our general conclusions robustly hold: there is ample space to impose higher taxes for those belonging to the top 1% of the EU wealth distribution.

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