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The impact of flat taxes on income and wealth inequality

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The impact of flat taxes on income and wealth inequality*

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Abstract

Flat tax systems have gained traction in countries that transitioned from socialism, with more than 20 nations in Eastern Europe and Central Asia adopting such systems since the mid-1990s. These reforms aimed to streamline tax processes, enhance compliance, and boost economic growth. While researchers have extensively explored their impacts on GDP and labor markets, their distributional consequences have not been as thoroughly examined. This paper examines the impact of flat tax reforms on income and wealth inequality in post-socialist countries, employing a variant of the difference-in-differences method. Our analysis covers a panel of countries from 1994 to 2015, assessing changes in top, middle, and bottom income and wealth shares. Our findings show that flat tax reforms have significantly increased income inequality, with top income shares rising and middle-income groups losing relative share. These effects are particularly pronounced for post-tax income, reflecting the role of reduced tax progressivity. In contrast, the impact on wealth inequality is more limited. While top wealth shares increase slightly in the short run, these effects do not persist, suggesting that wealth accumulation is driven more by structural factors than income tax changes. Although flat tax reforms may have stimulated economic growth, their regressive distributional effects suggest that, in societies with strong inequality aversion, their overall social welfare impact may be negative.

Keywords: taxation, flat taxes, income inequality, wealth inequality

JEL Classification codes: D31, D63, E62, H24, P36

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1. Introduction

The implementation of flat tax systems has been a focal point of considerable discourse and examination within economic literature, notably regarding their effects on economic growth and income distribution. Flat taxes, defined by a uniform tax rate imposed across all income brackets, have been adopted by numerous countries, particularly within Eastern and Central Europe, as a strategy to streamline tax frameworks and potentially invigorate economic activity. Between 1994 and 2011, a total of twenty post-communist countries instituted flat taxation on incomes at diverse, but generally quite low, rates. During their peak prevalence, a substantial majority of Eastern European and Central Asian nations upheld a flat tax system. This surge of reforms was propelled by the aim to attract investment, curtail tax evasion, and stimulate economic advancement in the wake of the Soviet Union's dissolution and the transition from centrally planned economies to market-oriented systems.

The post-communist context has provided a distinctive framework for implementing economic reforms. Following the dissolution of the Soviet Union, numerous Eastern European and Central Asian countries initiated a transition towards market economies, frequently employing radical reforms, including the implementation of flat taxes, to spur growth and facilitate integration into the global economy (Wheaton, 2023). These countries confronted considerable challenges such as the necessity to restructure their economies, combat widespread poverty, and address the social and economic upheavals resulting from the transition. During this transformative period, inequality exploded in these economies (Novokmet et al., 2018; Bukowski and Novokmet, 2024), prompting critical inquiries into the distributional impacts of various economic policies, notably tax reforms. The rationale for the adoption of flat taxes across these countries was multifaceted. Governments sought to attract foreign investment, foster domestic entrepreneurship, and reduce tax evasion—a particularly prevalent issue in the region—by simplifying the tax code and lowering rates (Wheaton, 2023).

While the economic growth implications of flat taxes have been extensively studied, the literature regarding their causal impact on income and wealth inequality remains relatively sparse and inconclusive. Early discussions on flat taxes, as proposed by Hall and Rabushka (1985), indicated that a flat tax system could enhance economic efficiency and growth by mitigating distortions in labor and capital markets. However, critics argued that such systems may exacerbate income inequality by disproportionately benefiting higher-income individuals. Empirical studies have yielded mixed evidence concerning the distributional effects of flat taxes. For example, simulations conducted by Peichl (2006) and González-Torrabadella and Pijoan-Mas (2006) indicated that flat tax reforms could increase income disparities, whereas Wheaton (2023) found no discernible impact on inequality.

This paper seeks to contribute to the existing body of literature by estimating the causal impact of flat tax reforms on income and wealth inequality. Utilizing rigorous empirical methods, specifically the Local Projection Difference-in-Differences (LP-DiD) approach, we aim to tackle the complexities associated with staggered adoption of flat taxes and heterogeneous treatment effects (Dube et al., 2023). In this framework, the paper explores the following questions: What are the distributional implications of flat tax reforms for income and wealth inequality? Did tax policy contribute to the sharp rise in inequality observed in Eastern Europe and post-Soviet countries since the 1990s? While prior studies have predominantly concentrated on income inequality, our research expands the literature by examining the consequences of flat tax reforms on wealth inequality. Grasping how income disparities generated by flat taxes translate into wealth inequality is vital, as wealth disparities are often more persistent and carry more profound socio-economic and political ramifications.

In our study, we find that flat tax reforms had a significant impact on income inequality and, to a lesser extent, wealth inequality. The results indicate that these reforms dispropor-

tionately benefited higher-income groups while imposing a greater burden on middle-income households, with smaller effects on lower-income groups. This finding emphasizes the potential for flat tax systems to exacerbate economic disparities, particularly among the middle class. Furthermore, our analysis reveals that while flat taxes may alter income distribution, their effects on wealth inequality are less pronounced, indicating that wealth accumulation is influenced by broader structural factors beyond immediate income tax policy changes.

One of the significant contributions of this study is the differentiation between pre-tax and post-tax inequality measures. Pre-tax income inequality illustrates the disparities in market income prior to the application of the tax and transfer system, mainly reflecting behavioral responses to changes in taxation, such as alterations in labor supply, tax avoidance, and income shifting. Conversely, post-tax inequality encompasses the redistributive impacts of tax and transfer policies, defining the final distribution of income following taxation. Unlike reductions in progressive taxation that mechanically increase post-tax inequality by lowering tax rates for high-income earners (Rubolino and Waldenström, 2020; Hope and Limberg, 2022a), flat tax reforms do not necessarily produce this effect, as they frequently include tax-free allowances and other exemptions that preserve certain aspects of progressivity (Davies and Hoy, 2002).

Therefore, while the consequences of flat taxes on pre-tax income inequality remain an open question, their impact on post-tax inequality is of particular relevance to understanding their actual distributional implications. This paper endeavors to examine both aspects, offering a thorough evaluation of whether flat tax systems exacerbate or alleviate inequality. Furthermore, our study is the first to analyze the impact of flat taxes on wealth inequality, leveraging recently available cross-country data to assess whether flat tax reforms influence longer-term wealth accumulation and concentration.

2. Background and theoretical considerations

2.1 Flat tax reform implementations

Flat tax systems have been implemented in numerous countries worldwide, with a notable concentration in Central and Eastern Europe and parts of Central Asia (see Table A.1). Many of these countries transitioned to flat tax regimes following the collapse of the Soviet Union as part of their broader shift from centrally planned economies to free-market systems. These reforms aimed to simplify tax structures, improve compliance, and stimulate economic growth in post-communist nations (Ganchev and Tanchev, 2019). The repeal of flat tax regimes provides additional insight into the political economy of these reforms. Wheaton (2023) documents that flat taxes were generally introduced by center-right coalitions after electoral victories, reflecting an ideological commitment to market liberalization. After about a decade in operation, roughly six of the initial flat tax regimes were repealed as political shifts and concerns over fairness prompted a return to progressive taxation (Table A.1). The repeals typically occurred when center-left coalitions returned to power, driven by concerns over fairness and the disproportionate burden imposed on middle- and working-class citizens

Flat tax systems are implemented in diverse ways across countries, with each nation tailoring the system to its unique economic and policy needs. While the core principles of flat taxation are similar, the specific designs and applications can vary significantly. The fundamental formulation of a flat tax system described by Keen et al. (2008) can be expressed as follows:

$$T_F(Y) = \max [t \cdot (Y - A_F), 0]$$

where $T_F(Y)$ represents the total tax liability, Y is the taxable income, t is the flat tax rate,

and A_F is the tax-free allowance. This formulation highlights the simplicity and uniformity that characterize flat tax systems. It ensures ease of calculation while allowing for specific exemptions, such as tax-free allowances, which help maintain a degree of progressivity in certain contexts.

Flat tax rates differ significantly across countries. For example, the Czech Republic imposes a flat tax rate of 15%, while Latvia applies a higher rate of 23%. These variations highlight how flat tax systems are tailored to individual countries' unique fiscal and policy needs (Basham and Mitchell, 2007).

Regarding the reform design, the flat tax implementation varied considerably across countries. In some instances, only the income tax schedule was modified, whereas in others, reforms encompassed simultaneous adjustments to corporate tax and value-added tax (VAT) systems. The actual change in tax burden also differed; some reforms reduced the general level of taxation, while others were implemented on a budget-neutral basis or even increased overall taxation in pursuit of broader fiscal objectives. Additionally, the tax-free allowance was often adjusted—sometimes increased, sometimes reduced, or even eliminated (see Table A.1)—making the overall tax change more complex and leaving the net impact on tax progressivity uncertain.

2.2 The inequality effects of introducing flat taxes

2.2.1 Theoretical Perspectives

As shown by Davies and Hoy (2002) and Keen et al. (2008), the overall impact of flat tax reforms on the post-tax income distribution depends crucially on design features, especially the size of the tax-free allowance and the chosen flat rate. Theoretically, even a flat tax can be progressive if the allowance is large enough to protect low-income earners. However, if the reform is designed to be revenue neutral compared with a more progressive tax system, there may be trade-offs: a lower flat rate can lead to ambiguous effects on inequality, with the possibility of being regressive for some income groups. In other words, there exists a “critical” flat tax rate above which the post-tax distribution is more equal than under the original system and below which it is less equal. This implies that the impact of flat tax reforms on post-tax inequality is not inherently positive or negative; instead, it hinges on specific parameter choices and the overall tax–benefit mix.

Moreover, the effect on pre-tax income inequality is also uncertain and hinges on taxpayers' behavioural responses; if the reform reduces progressivity and sparks behavioural responses, both pre- and post-tax inequality may increase—a finding supported by empirical studies on reduced progressivity (Rubolino and Waldenström, 2020; Hope and Limberg, 2022a). The reaction of the rich to reduced marginal tax rates can take three forms: lower taxes improve the work and investment incentives of high earners, leading them to accrue more earned and capital income; they reduce incentives for tax evasion and avoidance, thereby influencing how income is reported; and they increase the bargaining power of top executives for higher compensation (Volscho and Kelly, 2012; Piketty et al., 2014; Rubolino and Waldenström, 2020).

2.2.2 Empirical Evidence

Several empirical studies and simulation analyses provide evidence of flat taxes' effects on inequality. For instance, Peichl (2006) simulate the introduction of a flat tax in Germany, concluding that a 30% flat tax rate could significantly increase inequality. Similarly, González-Torrabadella and Pijoan-Mas (2006) examine a hypothetical flat tax for Spain and find that it would marginally exacerbate income disparities. In the U.S., Dunbar and Pogue (1998) show that implementing a flat tax would shift the burden from high-income to middle- and lower-

income groups, worsening inequality. Voinea and Mihaescu (2009) showed that Romania's flat tax disproportionately benefited higher-income groups, exacerbating inequality. Contrary to traditional arguments, these households consumed their extra income rather than investing it, undercutting claims that flat taxes foster growth through capital accumulation.

Wheaton (2023) finds that the flat tax reforms in Eastern European and Central Asian countries did not result in statistically significant changes in income inequality, as measured by both the Gini coefficient and the top decile's income share. While point estimates suggest a slight increase in inequality, these effects are not statistically significant. However, Wheaton (2023) uses income distribution data from the World Income Inequality Database (WIID) that are solely based on household surveys that severely underestimate top-end inequality. In contrast, this paper employed inequality data from the World Income Distribution (WID) database—which incorporates fiscal sources and national accounts—to considerably improve the reliability of inequality measures at the top (Alvaredo et al., 2013).

A few studies considered the impact of flat taxes on the middle-income group's position. For the United States, Skipper and Burton (2008) simulate flat tax policies and report a significant tax burden shift onto the middle-income group, narrowing the middle class and amplifying disparities. Likewise, Teller (2011) argues that while flat taxes simplify the federal tax system and potentially increase efficiency, they disproportionately burden middle-income households.

A related strand of research focuses on reductions in overall tax progressivity and their implications for inequality. For instance, Rubolino and Waldenström (2020) showed that major cuts in top marginal rates during the 1980s and 1990s substantially and persistently raised top income shares in Western countries. Hope and Limberg (2022a) explored the macro-level impact of cutting top-end taxes, examining all instances of major tax reductions on the rich across 18 OECD countries from 1965 to 2015. Their results indicate that, although significant tax cuts for high earners consistently increase the top 1% share of income, they bring no statistically discernible benefits in terms of GDP growth or employment.¹

2.2.3 The impact of flat taxes on other outcomes

Beyond inequality, flat tax systems are often championed for their potential to spur economic growth. Proponents like Cassou and Lansing (1996) argued that flat taxes enhance investment incentives for high-income groups, which can stimulate broader economic development. This rationale is particularly relevant in post-communist countries, where rapid economic growth has been a primary objective during their transitions to market economies. Wheaton (2023) found that flat tax reforms in twenty post-Communist countries boost GDP per capita growth by about 1.33 percentage points annually over a decade—resulting in a cumulative effect of roughly 14.4 percentage points. This growth is driven mainly by increased domestic investment and, to a lesser extent, labour supply. Adhikari and Alm (2016) used synthetic control methods to evaluate the impact of flat tax reforms on economic performance in eight Eastern and Central European countries and estimated that all treated countries experienced significant and economically meaningful increases in GDP per capita, persisting for about a decade.

From a policy perspective, flat tax regimes are often seen as tools for reducing tax evasion in high-evasion contexts. Duncan and Sabirianova Peter (2008) suggest that their simplicity and transparency can curtail evasion, indirectly reducing inequality. However, the magnitude of these effects varies significantly across countries.

Finally, the political appeal of flat taxes cannot be overlooked. Zimmerman (1984) notes their cross-ideological appeal, offering benefits to both conservatives (through tax cuts) and

¹Hope and Limberg (2022b) argued that structural changes in advanced economies, particularly the rise of knowledge-intensive service sectors, have eroded political and public support for high tax rates on the rich, thereby fueling further income inequality.

liberals (through potential efficiency gains). Nonetheless, the disproportionate benefits to high-income groups often overshadow their perceived advantages, reinforcing the need for careful assessment of their broader socio-economic impacts.

3. Data and empirical approach

3.1 Data

Although the concept of a flat tax is unified, the rates and regulations associated with it differ considerably across various countries. As depicted in Figure 1, the initial flat tax rates were not uniform, with Lithuania recording the highest rate. Many countries have adopted a flat tax rate of 10%, which is perceived as relatively low when compared to the average rates associated with progressive taxation systems. The map distinctly demonstrates that flat tax regimes are concentrated in Eastern Europe and Central Asia, primarily encompassing post-socialist nations. Notable exceptions to this trend include Belize, Grenada, and Paraguay.²

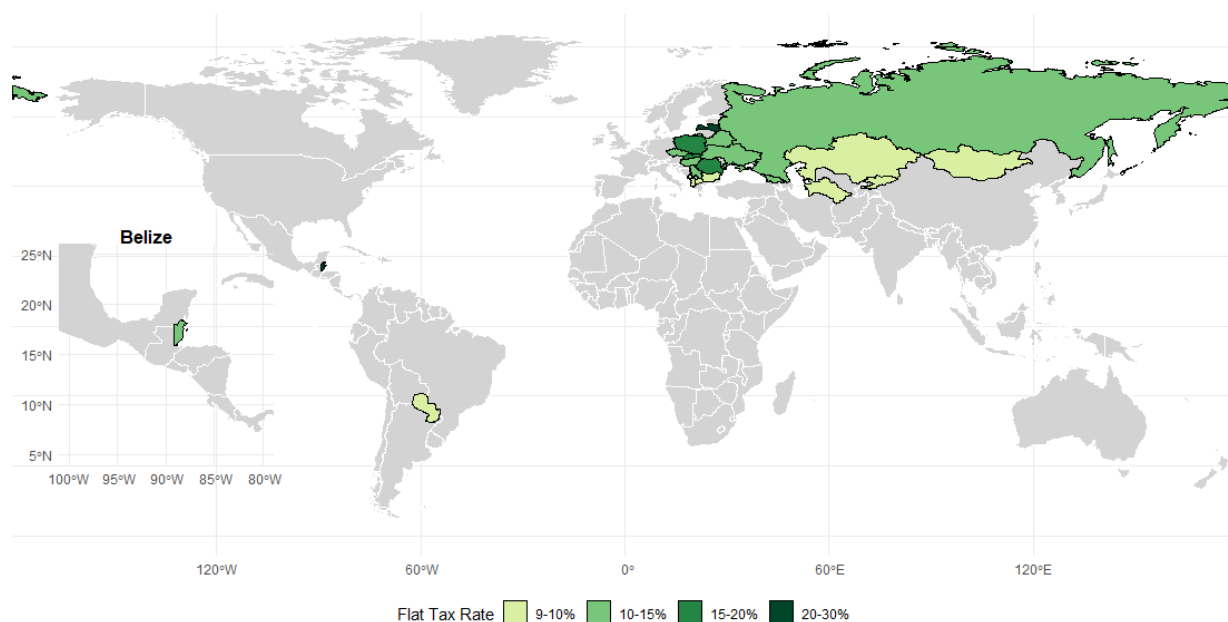


Figure 1: Map of Flat Tax Countries and Rates

Our treatment variable is a dummy that indicates whether a country has a flat tax regime. As illustrated in Table A.1, some countries reverted to a progressive tax system after a few years, while others, such as Estonia or Lithuania, have maintained or even lowered their flat tax rates to lower levels over time.³ Meanwhile, other countries continue to maintain relatively high flat tax rates, which can potentially impose a greater burden on middle-income groups compared to the progressive tax rates they faced previously. Poland presents a unique taxation system where labor income is progressively taxed, but business owners can opt for a flat-rate scheme, leading to most high incomes being subject to flat taxation (Bukowski et al., 2023). Thus, Poland is classified as having a flat tax regime in our baseline analysis, with robustness checks to assess the sensitivity of this classification.

²Several other flat-tax regimes have been excluded from our analysis due to a lack of data on inequality, missing information regarding the precise date of flat-tax reform implementation, or being classified as low-income countries. Such exclusions include Madagascar, Mauritius, Iraq, Seychelles, Trinidad and Tobago, and Tuvalu. Moreover, we have omitted Iceland as it had a flat tax only for a brief period (2007–2010).

³Latvia and Lithuania returned to progressive income taxation schemes after 2018. However, our sample ends in 2019.

Our inequality variables are sourced from the World Inequality Database (WID) (Chancel et al., 2022), available at <https://wid.world/>. We utilize a variety of wealth and income inequality measures including top, middle, and bottom income and wealth shares, as well as the Gini coefficient. These measures account for both labor and capital income, and they are derived from combined data from national accounts, survey data, fiscal data using a standardized methodology. This approach makes it possible to compare data over time and across different countries. By examining various shares, we can evaluate the differential impact on each income group, shedding light on which segments of society derive the most benefit. Additionally, using both pre-tax and post-tax income inequality measures allows us to see whether flat taxes led to behavioral adjustments, such as increased work effort, investment, salary negotiations, or reduced tax evasion or avoidance among the wealthy. Alternatively, it helps determine if the observed effects are primarily mechanical, resulting from reduced marginal tax rates on top-income earners.

In our analysis, we employ several control variables that are commonly used in the literature concerning the determinants of fluctuations in inequality (Rubolino and Waldenström, 2020). These variables include trade as a percentage of GDP, the ratio of employment to population, social protection expenditures (expressed as a percentage of GDP), a financial development indicator, and the number of patents per capita. Furthermore, this study refrains from controlling for GDP per capita, as prior research has demonstrated a distinctly positive relationship between flat taxation and economic growth (Adhikari and Alm, 2016; Wheaton, 2023). The inclusion of GDP per capita as a control variable could lead to a phenomenon known as "bad control," which may obscure the genuine effect of flat taxes on income inequality by inadvertently capturing part of the treatment effect through the mediating pathway of economic growth.

Table A.2 presents a more detailed description of the control variables utilised in this paper and their sources. Table A.3 reports descriptive statistics for all variables used.

3.2 Estimating the Impact of Flat Taxes on Inequality

To estimate the causal impact of flat tax reforms on inequality, we employ the Local Projection Difference-in-Differences (LP-DiD) methodology proposed by Dube et al. (2023). This approach allows us to address the challenges associated with staggered treatment adoption and heterogeneous treatment effects across units (see, for example, Roth et al. (2023) for a discussion of these issues), providing an unbiased estimate of the treatment effect.

The LP-DiD methodology extends the traditional Difference-in-Differences (DiD) framework by incorporating local projections to estimate dynamic treatment effects. The estimated equation in LP-DiD is as follows:

$$I_{i,t+h} - I_{i,t-1} = \delta_t^h + \beta_h^{LP-DiD} \Delta D_{it} + \gamma^h X_{it} + e_{it}^h \quad (1)$$

where $I_{i,t+h} - I_{i,t-1}$ represents the change in the outcome variable (e.g., income or wealth inequality index) for country i from period $t-1$ to $t+h$. The term δ_t^h captures time-specific effects, ΔD_{it} is the change in the treatment indicator (i.e., the introduction of a flat tax), X_{it} is a vector of control variables that account for other factors that may influence the outcome variable, β_h^{LP-DiD} is the coefficient of interest representing the dynamic treatment effect h periods after the reform, γ^h is the coefficient vector for the control variables, and e_{it}^h is the error term.

The LP-DiD approach offers several advantages over the standard DiD method. As shown by Dube et al. (2023), LP-DiD can estimate unbiased treatment effects even in the presence of staggered treatment adoption and heterogeneous effects across units. This is particularly relevant for our study, as flat tax reforms were implemented at different times across countries,

and their effects may vary due to differences in economic structures and policy environments. Additionally, LP-DiD is particularly suited for estimating the impact of non-absorbing treatments, where units can enter and exit the treatment state multiple times. In the context of flat taxes, some countries have implemented and subsequently modified or repealed their flat tax systems. For example, the Slovak Republic introduced a flat tax in 2004 but replaced it with a progressive tax system in 2013. LP-DiD allows us to account for such dynamics by defining the "clean control" condition appropriately.

The LP-DiD methodology employs a "clean control" condition to avoid the "negative weights" problem that can bias traditional DiD estimates. This condition ensures that the control group consists of units that have not been treated recently and will not be treated in the near future. In our analysis, we define the clean control condition as in Dube et al. (2024, p. 29), which restricts the estimation sample to observations that are either newly treated or not-yet-treated. This helps to mitigate biases arising from the inclusion of previously treated units in the control group.

In the context of non-absorbing treatment, where countries can enter and exit the treatment state multiple times, the clean control condition becomes particularly important. This condition ensures that the control group is not influenced by past treatment effects, which could bias the estimation of the treatment effect. When estimating the impact of flat tax reforms on inequality, we assume that the effect of previously treated countries stabilizes after L years. This assumption allows us to define the clean control condition as follows:

$$\begin{cases} \text{treatment} & (D_{i,t+j} = 1 \text{ for } 0 \leq j \leq h) \text{ and } (D_{i,t-j} = 0 \text{ for } 1 \leq j \leq L), \\ \text{or clean control} & \Delta D_{i,t-j} = 0 \text{ for } -h \leq j \leq L \end{cases} \quad (2)$$

This equation specifies that for a country to be considered as treated, it must have adopted the flat tax reform and remained under its influence for the duration of interest (h periods). Additionally, the country must not have been treated in the L periods before the reform. For a country to be considered a clean control, it must not have experienced any change in treatment status from $t-h$ to $t+L$.

We use an equally-weighted variant of the LP-DiD approach, estimated using regression adjustment. This ensures that each treated unit contributes equally to the estimated treatment effect, providing a more balanced assessment of the impact of flat tax reforms.

While the LP-DiD methodology addresses several challenges associated with estimating the impact of flat tax reforms, there are potential identification issues and confounders that could affect our results. Other policy reforms or economic shocks occurring simultaneously with the flat tax reforms could confound our estimates. For example, many post-socialist countries implemented a range of neoliberal reforms during the transition period, including privatization, trade liberalization, and financial sector reforms. These reforms could have independent effects on income and wealth inequality, making it difficult to isolate the impact of flat tax reforms.

There is a concern that the adoption of flat tax reforms could be endogenous to the level of inequality in a country. However, we argue that during the post-socialist transition, policymakers were primarily focused on achieving economic growth and efficiency gains, rather than addressing inequality. As highlighted by Adhikari and Alm (2016), the flat tax reforms were often driven by ideological and political motivations, with little consideration for their distributional impacts. Anticipation effects could bias our estimates if countries adjusted their behavior in anticipation of the flat tax reforms. However, the flat tax reforms were often implemented quickly, reducing the likelihood of significant anticipation effects (Adhikari and Alm, 2016).

In conclusion, the LP-DiD methodology provides a robust framework for estimating the causal impact of flat tax reforms on income and wealth inequality. By addressing the challenges

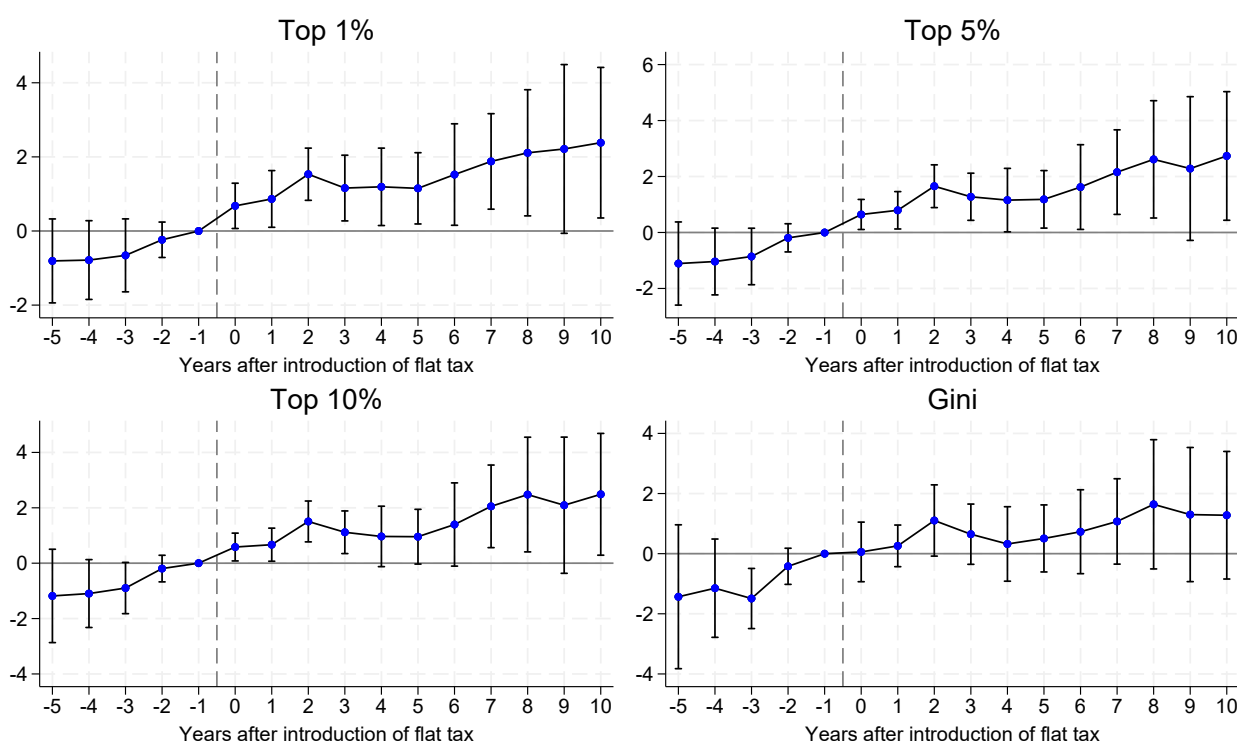
associated with staggered treatment adoption, heterogeneous effects, and non-absorbing treatments, we can obtain unbiased estimates of the treatment effect while accounting for potential confounders and identification issues. In the robustness analysis, we also employ other estimators, including the standard TWFE and the heterogeneity-robust difference-in-differences (DiD) estimator introduced in de Chaisemartin and d’Haultfoeuille (2020).

4. Empirical results

4.1 Effect of flat taxes on income inequality

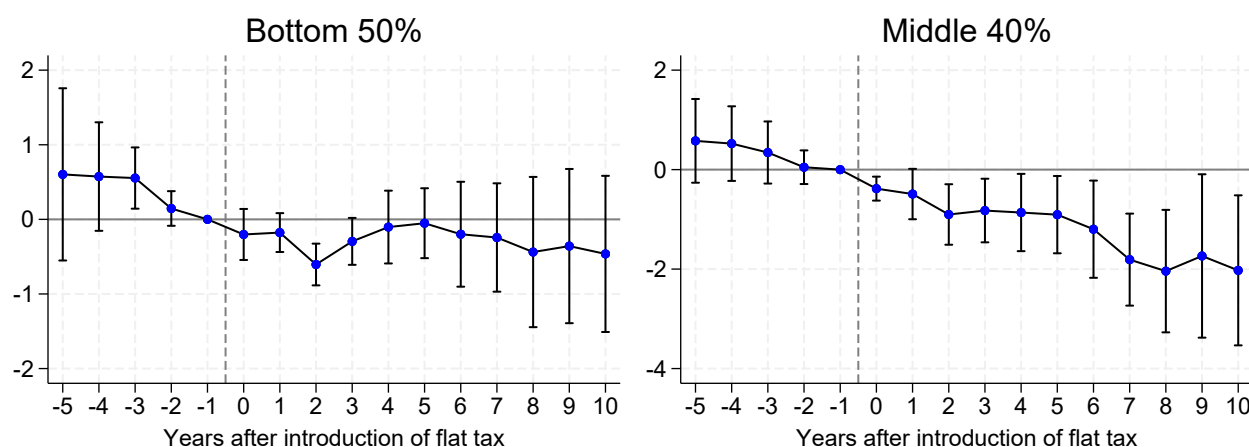
Figure 2 presents our central findings concerning pre-tax top income shares and the Gini coefficient across a decade following the policy reform. The estimates reveal that the confidence intervals for the pre-treatment periods intersect with zero, indicating no significant disparities in the inequality trends between the treatment and control groups preceding the implementation of the flat tax reforms. This observation supports the parallel trends assumption, which is crucial for the validity of our approach. However, immediately subsequent to the introduction of the flat tax system, we observe a substantial uptick in pre-tax top income shares. Specifically, regarding the top 1% income share, the magnitude of the effect exceeds 2 percentage points a decade post-implementation of flat taxes. Given that the focus is on pre-tax income, this suggests that the policy led to some form of behavioral adaptation among top income earners, potentially encompassing increased labor supply, enhanced salary negotiations, or diminished tax avoidance and evasion. Nevertheless, the constraints of the available data preclude us from differentiating among these reasonable explanations.

Figure 2: Effects of flat tax reforms on pre-tax top income shares and Gini coefficient, 1980–2019



Note: The figure shows event study estimates and the 95% confidence intervals based on the LP-DID approach as specified in Equations 1-2. Standard errors clustered at the country level. Control variables include trade (% of GDP), employment to population ratio, social protection expenditure (% of GDP), financial development indicator, and patents per capita.

Figure 3: Effects of flat tax reforms on pre-tax bottom 50% and the middle 40% income shares, 1980–2019



Note: The figure shows event study estimates and the 95% confidence intervals based on the LP-DID approach as specified in Equations 1-2. Standard errors clustered at the country level. Control variables include trade (% of GDP), employment to population ratio, social protection expenditure (% of GDP), financial development indicator, and patents per capita.

On the other hand, we do not observe a significant impact on the Gini index of pre-tax income distribution. This suggests that the increase in the share of total pre-tax income going to the top percentile groups must have been counterbalanced by reductions in income shares allocated to other segments of the population. To further investigate this issue, we examine the income shares of the middle 40% and the bottom 50% of the population, as shown in Figure 3.

The results in Figure 3 indicate that the implementation of a flat tax has had a particularly adverse impact on the middle 40% of the income distribution⁴, whose share of total pre-tax income declines notably over time. This suggests that the burden of the reform has primarily fallen on middle-income earners. Previously such results were obtained in a theoretical model by Davies and Hoy (2002) and in a simulation by Skipper and Burton (2008). The finding from Figure 3 also aligns with earlier literature highlighting the "melting middle class" phenomenon, in which middle-income households experience a relative decline in their economic standing compared to other groups (Pressman, 2007; Derndorfer and Kranzinger, 2021). Our findings suggest that flat tax reforms in the post-socialist countries were among the factors contributing to the relative decline of middle-income groups.

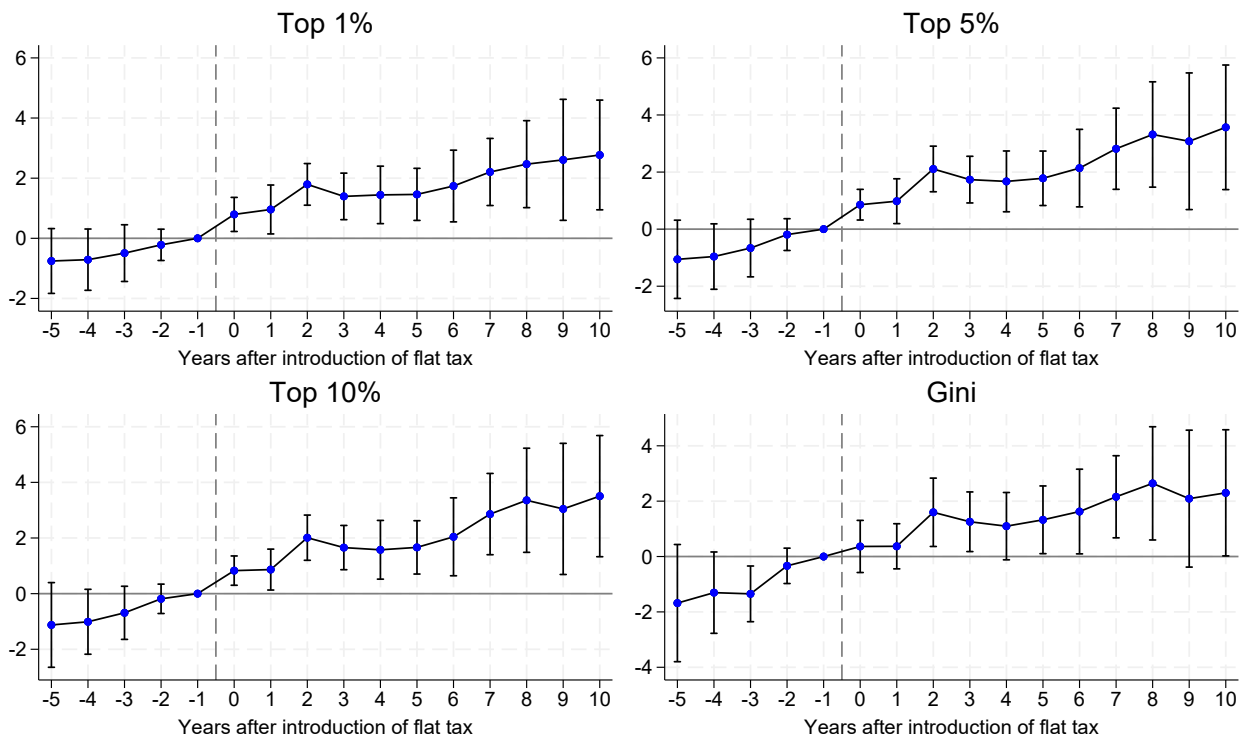
One explanation for how flat taxes contributed to these trends is that, while such reforms typically resulted in a reduction of tax rates for high-income earners, certain middle-income households may have encountered an increase in their tax liabilities in comparison to the prior progressive taxation framework. Consequently, this alteration adversely affected work incentives for these households, thereby contributing to the observed relative decline in the pre-tax income share of middle-income groups.

On the other hand, the bottom 50% income share appears to be less affected by the introduction of the flat tax. Although there is some indication of a downward trend, the estimates are not statistically significant, implying that the reform primarily "pre-distributed" income between the middle and upper segments of the distribution rather than significantly affecting the lowest-income earners. One likely reason for this is that the flat tax reforms did not substantially alter taxation rates for the poorer half of the population.

In Figures 4-5, the post-tax estimates reveal a more pronounced impact of flat tax reforms

⁴The "middle 40% income share" refers to the proportion of national income after excluding the income shares of the top 10% (highest income earners) and the bottom 50% (lowest income earners)

Figure 4: Effects of flat tax reforms on the post-tax top income shares and Gini coefficient, 1980–2019



Note: The figure shows event study estimates and the 95% confidence intervals based on the LP-DID approach as specified in Equations 1-2. Standard errors clustered at the country level. Control variables include trade (% of GDP), employment to population ratio, social protection expenditure (% of GDP), financial development indicator, and patents per capita.

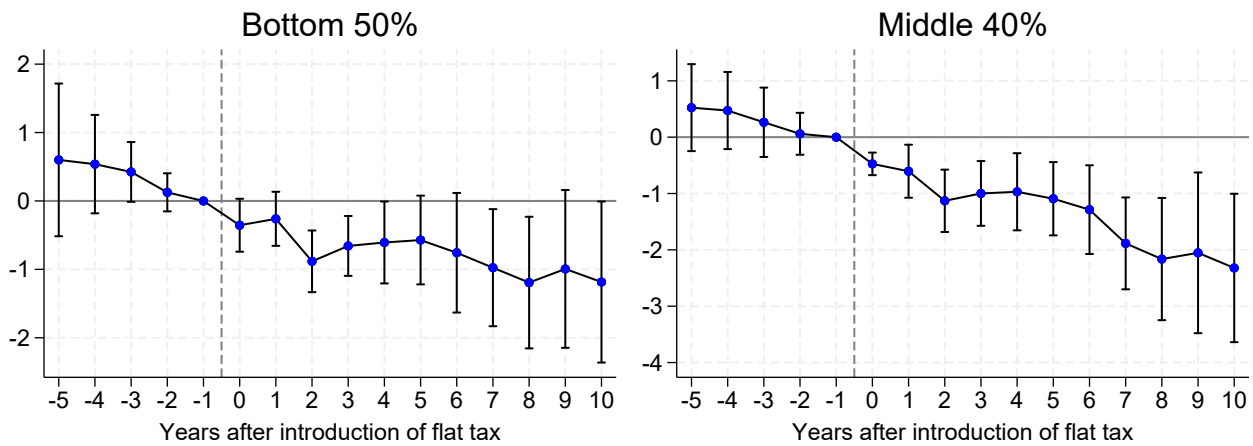
on income inequality than is observed in the pre-tax measures. For example, the top 1% post-tax income share increases by roughly 3 percentage points, while the top 5% share rises by about 4 percentage points over a 10-year horizon. In contrast, although the pre-tax measures also show increases, their magnitude is noticeably smaller. Similarly, the post-tax Gini coefficient shows significant increases in the mid-term, specifically between 3 to 8 years after the reform, showing a marked worsening in overall income distribution.

The stronger responses in the post-tax measures suggest that flat tax reforms exerted both behavioral effects and direct effects through reduced progressivity. By lowering the marginal tax rates on high incomes, the reforms not only incentivized top earners to adjust their behavior (through increased labor supply, higher salary negotiations, or reduced tax avoidance) but also directly shifted the tax system toward a less progressive structure. This reduced progressivity likely amplified the concentration of income at the top while simultaneously increasing the tax burden on middle-income households.

Furthermore, the large negative effects observed for the post-tax middle 40% (and a similar, though less pronounced, pattern for the bottom 50%) imply that the reforms mostly eroded the benefits of free tax allowances that were a feature of the prior progressive systems. Under the old system, these allowances helped shield the middle and lower-income groups from high effective tax rates. Their reduction under the flat tax regime contributed to the adverse outcomes for both the bottom and middle-income groups, suggesting that the loss of such redistributive features directly translated into worse post-tax outcomes.

In summary, section 4.1 demonstrates that while both pre-tax and post-tax measures indicate an increase in income inequality following flat tax reforms, the effects are considerably stronger post-tax. With top income shares rising by several percentage points and the Gini

Figure 5: Effects of flat tax reforms on the post-tax bottom 50% and the middle 40% income shares, 1980–2019



Note: The figure shows event study estimates and the 95% confidence intervals based on the LP-DID approach as specified in Equations 1-2. Standard errors clustered at the country level. Control variables include trade (% of GDP), employment to population ratio, social protection expenditure (% of GDP), financial development indicator, and patents per capita.

coefficient showing significant mid-term increases, the evidence suggests that the reforms not only spurred behavioral responses but also directly reduced tax progressivity, benefiting high-income earners at the expense of the rest of the population, particularly middle-income groups.

4.2 Effect of flat taxes on wealth inequality

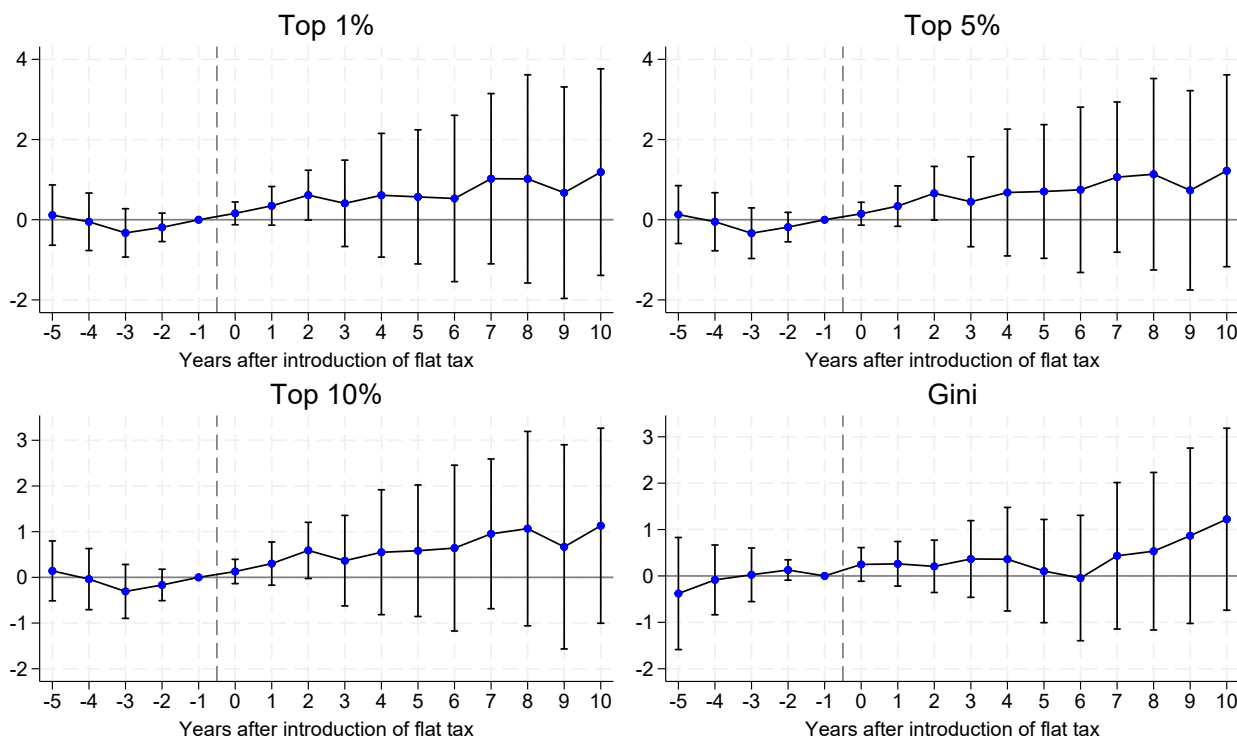
Figures 6-7 present the impact of flat tax reforms on wealth inequality, revealing a stark contrast with their effects on income distribution.⁵ While flat taxes lead to significant increases in income inequality, their impact on wealth distribution appears much weaker. In the short term, the top 1% wealth share (and other top shares) shows a modest but statistically significant increase of about 1 percentage point within the first three years, but this effect fades over time. The Gini coefficient for wealth also exhibits a slight rise initially, though it remains statistically insignificant. The middle 40% wealth share shows a small negative effect that is statistically significant in the two-year horizon but becomes insignificant afterward.

The limited effect of flat taxes on wealth inequality likely stems from the fact that wealth accumulation depends more on structural and intergenerational factors, such as inheritance, asset appreciation, and capital returns, rather than short-term income fluctuations. Since flat taxes primarily affect labor income taxation and do not directly target capital gains or wealth accumulation, their influence on longer-run wealth distribution remains weak. Moreover, in many countries that adopted flat tax systems, capital income taxation remained unchanged, meaning that wealthier individuals, who derive a significant portion of their income from investments rather than wages, were less affected by the reform.

Overall, the results in this section suggest that while flat taxes reshape income distribution, their effects on wealth inequality were marginal and largely temporary. The small increase in top wealth shares in the short term may reflect immediate behavioral responses, such as increased savings among high-income individuals benefiting from lower tax rates. The results

⁵In this analysis, we remove from the sample all countries that currently have or had net wealth taxes since the 1990s (Perret, 2021) to avoid changes in wealth tax design as a confounder. It is difficult to control for changes in wealth tax design, as during the period under study, some countries repealed wealth taxes while others reformed them by modifying rates, bases, or exemption schemes. The results remain very similar when wealth tax countries are included in the sample and we estimate the models using dummy variable indicating wealth taxes as an additional covariate.

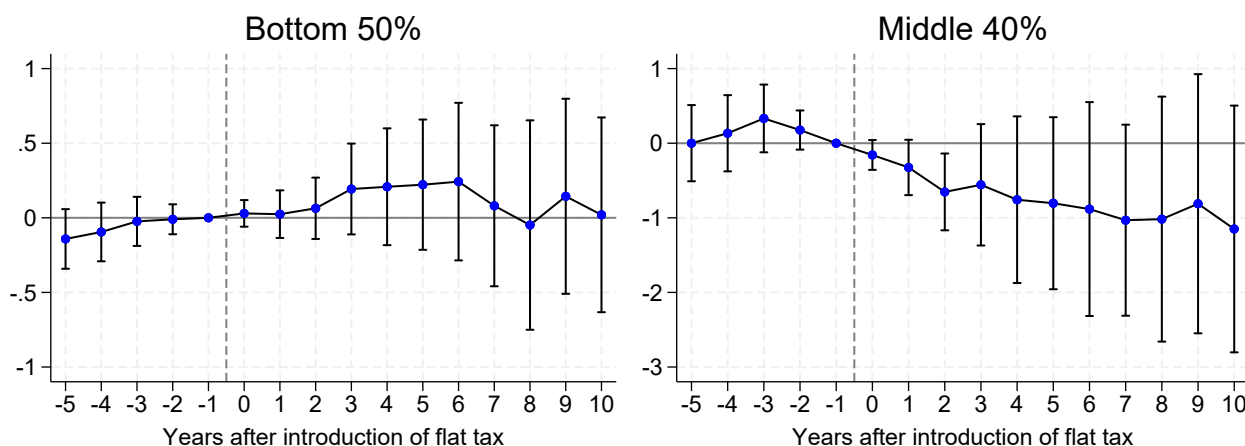
Figure 6: Effects of flat tax reforms on top wealth shares and the Gini coefficient



Note: The figure shows event study estimates and the 95% confidence intervals based on the LP-DID approach as specified in Equations 1-2. Standard errors clustered at the country level. Control variables include trade (% of GDP), employment to population ratio, social protection expenditure (% of GDP), financial development indicator, and patents per capita.

imply that income tax reforms alone are unlikely to meaningfully alter wealth inequality unless accompanied by policies directly targeting wealth accumulation, such as taxation of capital gains, net wealth or inheritance.

Figure 7: Effects of flat tax reforms on the bottom and the middle wealth shares



Note: The figure shows event study estimates and the 95% confidence intervals based on the LP-DID approach as specified in Equations 1-2. Standard errors clustered at the country level. Control variables include trade (% of GDP), employment to population ratio, social protection expenditure (% of GDP), financial development indicator, and patents per capita.

5. Robustness tests

To assess the robustness of our baseline findings, we conduct several sensitivity analyses. First, one potential concern in our analysis is the classification of Poland as a flat tax country. While labor income in Poland remains under a progressive tax system, self-employed individuals can opt for a flat tax regime, leading to a substantial portion of high-income earners being subject to flat taxation. To test whether this classification drives our results, we re-estimate our models excluding Poland from the sample (Figure B.1). The results remain largely unchanged, confirming that the inclusion of Poland does not drive the main findings. The post-tax income shares of the top 1% and middle 40% still show similar patterns of increase and decline, respectively, and the effects on wealth inequality remain weak.

Second, flat tax reforms often coincide with broader structural reforms, such as labor market liberalization, privatization, and financial deregulation, which may confound our estimates. To account for this, we include an additional structural reform indicator in the regression taken from Alesina et al. (2023). The inclusion of this control variable does not materially affect the results (Figure B.2). The estimated effects of flat taxes on top income shares and the Gini coefficient remain significant, while the impact on wealth inequality continues to be small and short-lived. This suggests that our findings are not simply capturing the broader economic transitions that accompanied flat tax adoption.

Third, we also test the robustness of our results by applying different estimation methods beyond the baseline LP-DiD approach. Specifically, we use the standard TWFE estimation and the heterogeneity-robust DiD estimator introduced by de Chaisemartin and d'Haultfoeuille (2020). Figure B.3 presents the results using these alternative approaches. The findings remain qualitatively similar across methods, especially for post-tax income measures and wealth distribution, reinforcing the robustness of the estimated effects. "The increase in post-tax top income shares following the flat tax reforms persists, as does the decline in the middle 40% income share." The effects on wealth inequality remain limited, suggesting that the weak impact of flat taxes on wealth distribution is not an artifact of the chosen estimation technique.

Overall, these robustness checks strengthen the credibility of our findings, reinforcing the conclusion that flat tax reforms significantly increased income inequality in post-socialist countries, particularly at the expense of middle-income groups, while having only a marginal and short-term effect on wealth inequality.

6. Conclusions

This study explores the impact of flat tax reforms on income and wealth inequality in post-socialist countries across Eastern Europe and Central Asia. The findings indicate that such reforms have led to a pronounced increase in both pre-tax and post-tax income inequality, characterized by a rise in the share of top incomes and a decline in the share of middle incomes. These results are consistent with existing research regarding tax progressivity and its relationship with inequality. Notably, Rubolino and Waldenström (2020) and Hope and Limberg (2022a) have demonstrated that decreased tax progressivity results in sustained growth in top income shares. Our findings corroborate this trend while broadening the analysis to encompass a set of countries that have not been comprehensively examined within this framework.

One of the key findings is the increase in the pre-tax income share of top income earners. This finding demonstrates the impact of tax policies on behavioral changes. The rise in pre-tax inequality within a flat tax system may result from a decline in tax evasion (indicating better income reporting) and/or increased salary demands (due to the absence of income brackets).

Conversely, the pre-tax income share of the middle 40% declines sharply. This decline could be attributed to an increase in the tax rate for this group, which may create disincentives for earning more. Given that our findings for post-tax periods mirror those of the pre-tax period, we conclude that the flat tax reforms benefited top income earners (the top 1% and 10%) while adversely affected the middle 40%. This suggests that a flat tax eroded the middle class while promoting income concentration among high earners.

A key contribution of our research lies in the exploration of the impact of flat tax reforms on wealth inequality, a subject that received no attention so far. Our findings suggest that, although the short-term consequences of flat tax implementation on wealth inequality are statistically significant, these effects tend to diminish over time. This observation indicates that, while the initial alterations in income distribution caused by flat taxes are perceptible, substantive changes in wealth inequality are not sustained, potentially due to structural factors that govern wealth accumulation.

An important policy implication of our analysis is that public policy amplified income inequality during the post-socialist transition. The shift to flat tax regimes reduced tax progressivity when inequality was already rising due to broader market liberalization and privatization. While our findings indicate that flat taxes worsened income and, in the short term, wealth distribution, other studies (e.g. Adhikari and Alm 2016; Wheaton 2023) have found that they also generated efficiency gains, boosting GDP per capita. This suggests that the overall assessment of flat tax reforms must consider both dimensions – efficiency and equity. Our results imply that for societies with a high aversion to inequality, the net effect of these reforms may be negative, as the growth benefits may not compensate for the substantial increase in economic disparities.

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Appendix A. Variable description

Table A.1: Flat tax rate regimes in personal income taxation (1994–2019)

Country	Year of adoption of PIT flat rate (repeal)	PIT rates before flat tax (%)	PIT rate after flat tax (%)	Basic PIT allowance change
Estonia	1994	16–35	26, reduced to 20 in 2009	Modest increase
Lithuania	1994 (2019)	18–33	33, reduced to 15 in 2009	Substantial increase
Grenada	1996 (2014)	10–30	30	Substantial increase
Latvia	1997 (2018)	25, 10	25, reduced to 23 in 2015	Slight reduction
Belize	1998	15–45	25	Increase
Russia	2001	12, 20, 30	13	Modest increase
Serbia	2003 (2010)	10–40	14	
Poland	2004	19–40	19	Unchanged
Slovak Republic	2004 (2013)	10–38	19	Substantial increase
Ukraine	2004 (2011)	10–40	13	Increase
Georgia	2005	12–20	12	Eliminated
Romania	2005	18–40	16	Increase
Turkmenistan	2005		10	
Kyrgyzstan	2006	10–20	10	Unchanged
Paraguay	2006	none	10	
Macedonia	2007	15–24	12, reduced to 10 in 2008	Unchanged
Kazakhstan	2007	5–20	10	Substantial increase
Mongolia	2007	10–30	10	Substantial increase
Albania	2007 (2014)	1–20	10	Increase
Montenegro	2007 (2013)	15–23	15, reduced to 9 in 2009	Increase
Czechia	2008 (2013)	12–32	15	Substantial increase
Bulgaria	2008	10–24	10	Eliminated
Belarus	2009	9–30	12, increased to 13 in 2015	
Bosna and Herzegovina	2009	0–20	10	Introduced
Hungary	2013	17–32	16, reduced to 15 in 2015	Substantial increase

Source: Paulus and Peichl (2009); Peichl (2014); Wheaton (2023).

Table A.2: Description of control variables

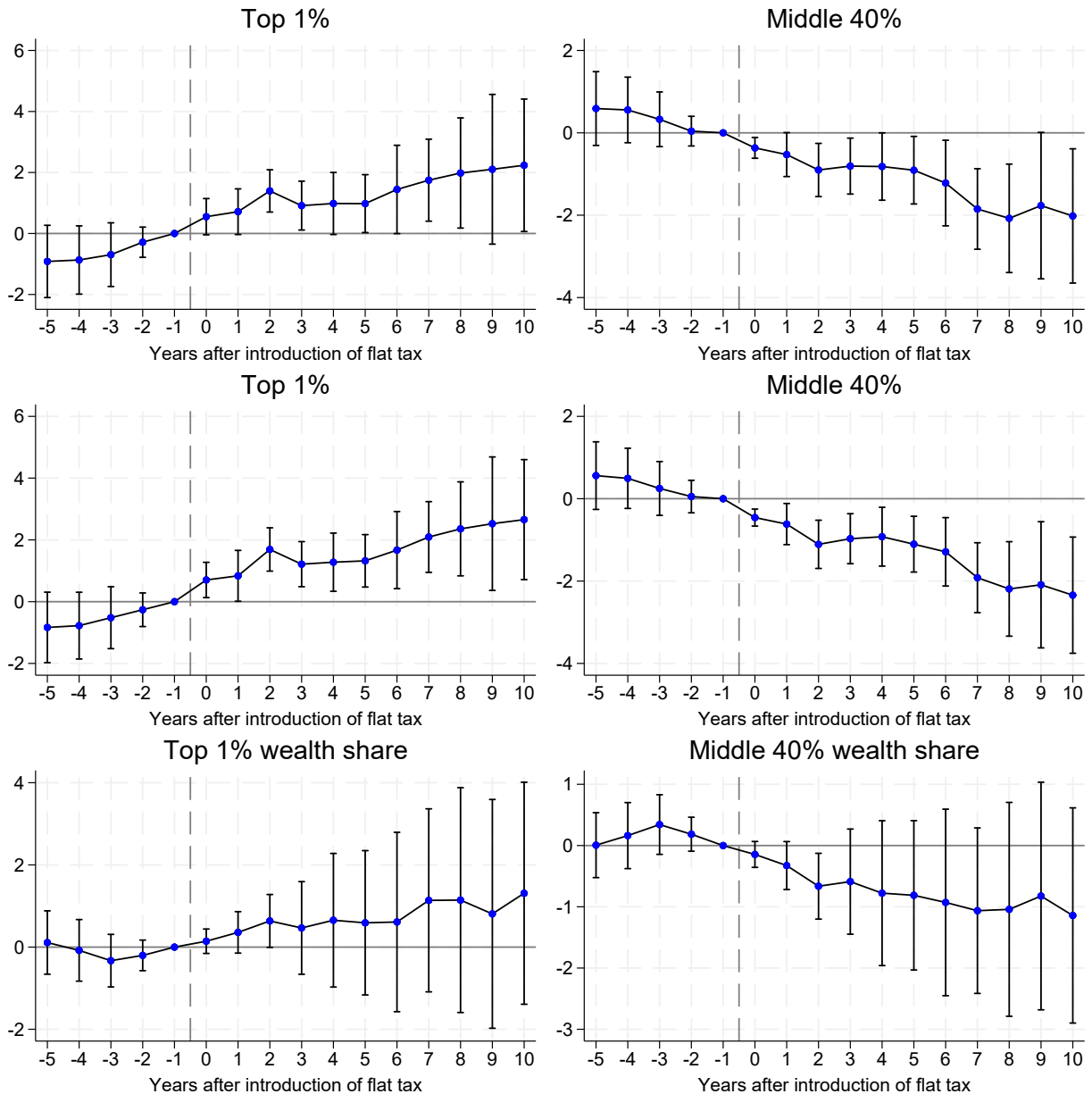
Variable	Description	Source
GDP per capita	Logarithm of the real GDP per capita in 2011\$	The Maddison Project Database 2023
Trade	Sum of exports and imports as a share of GDP	The World Bank
Employment ratio	Employed persons in proportion to population	Total Economy Database
Social protection expenditure	Social protection expenditures as a share of GDP	Gethin (2024)
Financial development	Financial development composite indicator	Svirydzhenka (2016)
Patents	Resident patent applications per million population	The World Intellectual Property Organization ddd (WIPO)
Fiscal progressivity	Percent change in inequality, measured as the top 10% to bottom 50% average income ratio, before and after taxes	Fisher-Post and Amory (2023)

Table A.3: Descriptive statistics

Variable	Mean	Min	Max	Std. Dev.	Number of observations
Top 1% pre-tax income share	15.4	2.5	35.6	6.0	4960
Top 5% pre-tax income share	32.40	9.77	58.63	9.75	4960
Top 10% pre-tax income share	43.80	16.63	71.53	10.91	4960
Gini coefficient for pre-tax income	54.92	21.76	78.12	11.29	4960
Bottom 50% pre-tax income share	15.43	4.88	36.79	5.78	4960
Middle 40% pre-tax income share	40.77	22.94	55.74	5.68	4960
Top 1% post-tax income share	13.65	1.73	36.60	6.24	4960
Top 5% post-tax income share	29.33	7.77	54.88	10.53	4960
Top 10% post-tax income share	40.06	14.05	66.97	12.10	4960
Gini coefficient for post-tax income	47.40	12.43	75.00	14.75	3780
Bottom 50% post-tax income share	18.80	6.10	39.49	7.91	4960
Middle 40% post-tax income share	41.15	24.67	58.21	5.08	4960
Top 1% wealth share	29.72	12.09	58.50	9.16	2410
Top 5% wealth share	50.24	29.87	79.35	9.18	2410
Top 10% wealth share	62.81	41.29	90.82	8.50	2410
Gini coefficient for wealth	77.14	53.95	105.96	6.88	2410
Bottom 50% wealth share	3.75	-8.02	15.87	2.66	2410
Middle 40% wealth share	33.44	15.23	47.80	6.50	2410
Log GDP per capita	9.59	7.33	11.98	0.76	3713
Exports and imports (% of GDP)	87.80	0.02	437.33	52.72	3682
Employment ratio	42.98	17.54	79.23	8.33	2355
Social protection expenditures (% of GDP)	8.37	0.01	28.29	6.74	3880
Financial development index	0.34	0.00	1.00	0.23	4200
Resident patent applications per million population	184.43	0.10	3315.10	409.16	2668
Fiscal progressivity	34.19	5.08	77.07	12.93	3760

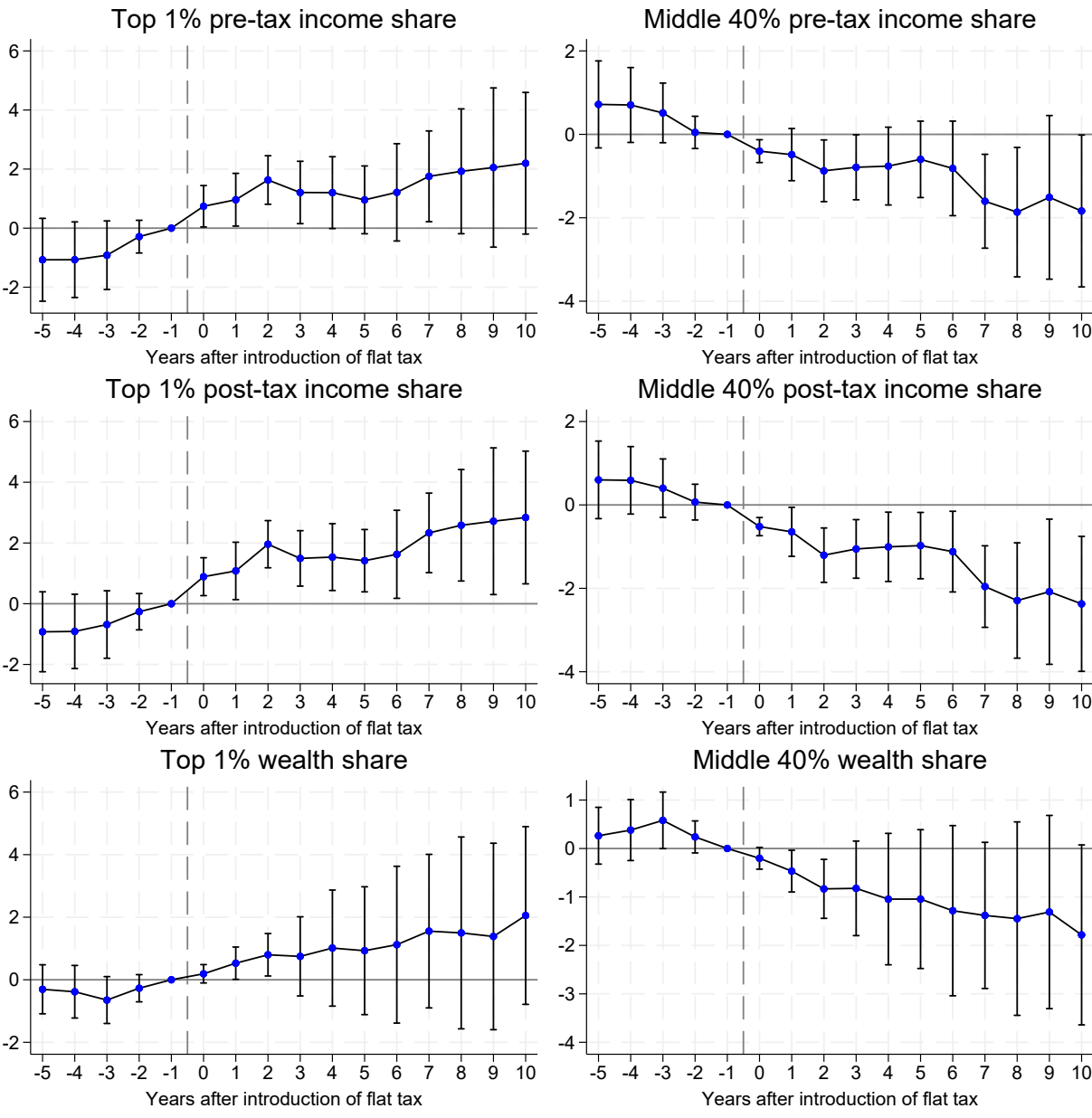
Appendix B. Additional tables and figures

Figure B.1: The effect of flat taxes on income and wealth inequality: sample without Poland, 1980–2019



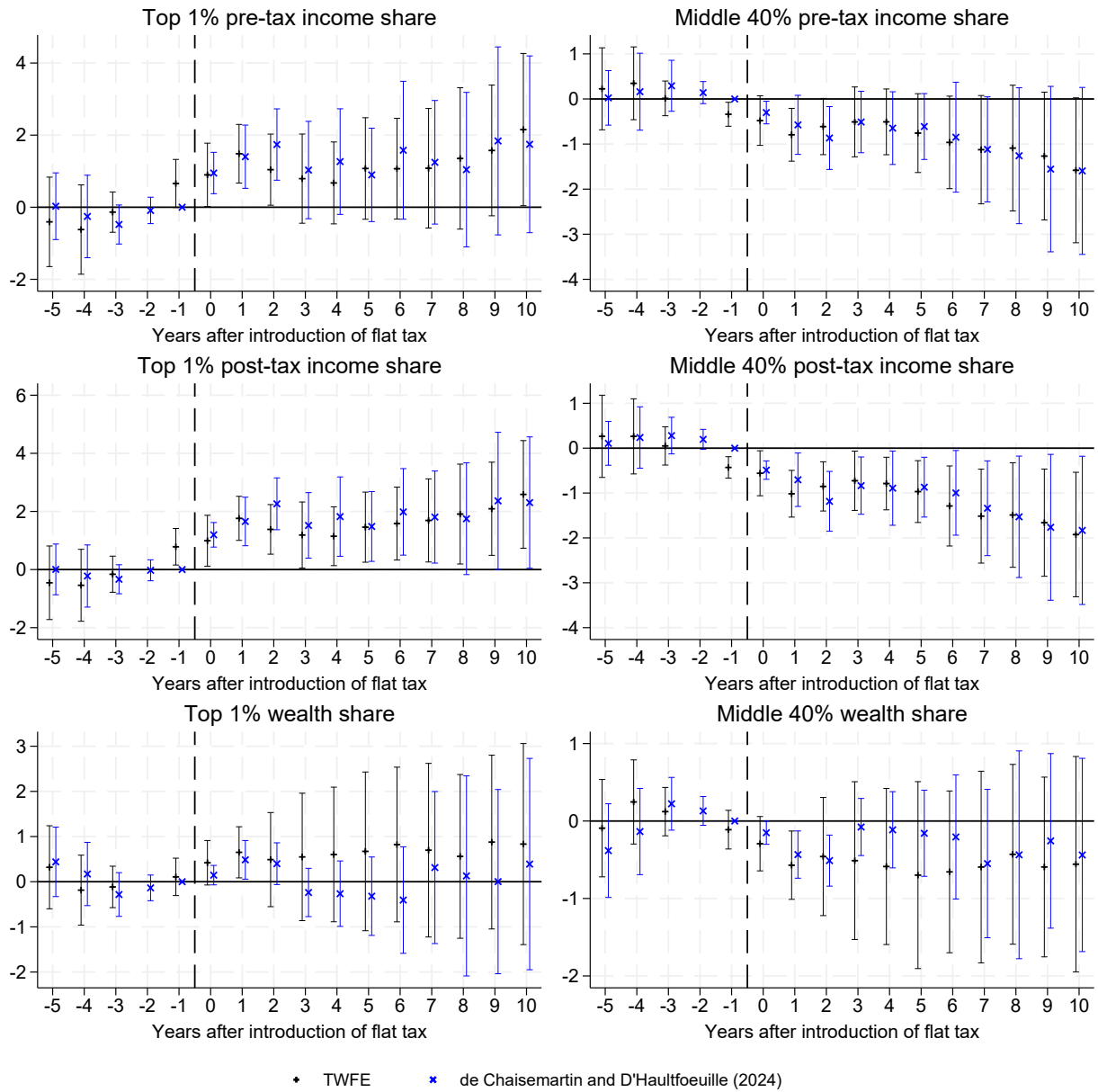
Note: The figure shows event study estimates and the 95% confidence intervals based on the LP-DID approach as specified in Equations 1-2. Standard errors clustered at the country level. Control variables include trade (% of GDP), employment to population ratio, social protection expenditure (% of GDP), financial development indicator, and patents per capita.

Figure B.2: The effect of flat taxes on income and wealth inequality: additional covariate (structural reform indicator), 1980–2019



Note: The figure shows event study estimates and the 95% confidence intervals based on the LP-DID approach as specified in Equations 1-2. Standard errors clustered at the country level. Control variables include trade (% of GDP), employment to population ratio, social protection expenditure (% of GDP), financial development indicator, patents per capita, and structural reforms indicator.

Figure B.3: The effect of flat taxes on income and wealth inequality: alternative estimators, 1980–2019



Note: The figure shows event study estimates and the 95% confidence intervals based on the LP-DID approach as specified in Equations 1-2. Standard errors clustered at the country level. Control variables include trade (% of GDP), employment to population ratio, social protection expenditure (% of GDP), financial development indicator, and patents per capita.