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Clemens Fuest (ifo Institute, LMU Munich, CESifo), Klaus Gründler (ifo Institute, LMU Munich, CESifo), Niklas Potrafke (ifo Institute, LMU Munich, CESifo), and Fabian Ruthardt (ifo Institute, LMU Munich)

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Read My Lips? Taxes and Elections*

Clemens Fuest[†a,b,c], Klaus Gründler[a,b,c], Niklas Potrafke[a,b,c], and Fabian Ruthardt[a,b]

[a]ifo Institute, Munich, [b]University of Munich (LMU), [c]CESifo, Munich

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Abstract

Research on many important questions on taxation is impeded by a lack of cross-nationally comparable data. We introduce a new dataset that includes quantitative harmonized indices of tax reforms based on qualitative information of about 900 Economic Surveys from the OECD and 37,000 tax-related news from the IBFD archives collected by the IMF (Amaglobeli et al., 2018). Our dataset provides indicators on tax reforms for tax rates and tax bases, along with detailed sub-indices for six types of taxes (23 countries, 1960–2014). Relating tax reforms to the timing of elections, we provide first empirical evidence on electoral cycles in tax reforms on the national level. Our results show that politicians postpone tax rate increases to after elections. Examining heterogeneity across tax types, we find that electoral cycles are particularly pronounced for value added tax rates and personal income tax rates.

Keywords: Tax reforms; tax systems; tax rates; tax bases; data set; electoral cycles

JEL Codes: D72; H20; H25; C23

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[†]Corresponding author. University of Munich and ifo Institute for Economic Research. Poschingerstraße 5, 81679 Munich, Germany. E-Mail: Fuest@ifo.de.

1 Introduction

The theories of political business cycles describe that politicians implement expansionary fiscal policies before elections and postpone unpopular fiscal measures to after elections (Nordhaus, 1975; Rogoff and Sibert, 1988; Rogoff, 1990). Empirical evidence shows that election-motivated politicians increase public expenditure before elections[1], but little is known regarding electoral cycles in taxation. Previous studies have examined how electoral motives influence individual tax types at the local and sub-national level. There is no evidence, however, about heterogeneity in electoral cycles across tax types and, more generally, on electoral cycles in taxation at the national level. This lack of evidence is striking, as the key tax policy decisions are made on the national level in most countries and electoral motives are likely to affect tax decisions differently across tax types.

An important reason why there is little evidence on electoral cycles in taxation on the national level and across tax types is a lack of cross-nationally comparable data on tax changes. We introduce new harmonized indices on reforms of tax rates and bases for 23 advanced and emerging market economies including granular sub-indices on six tax types between 1960 and 2014 based on extensive qualitative information collected by Amaglobeli et al. (2018). Our indices provide an encompassing overview of tax reforms and international trends in taxation over the past six decades. We use our indices to investigate electoral cycles in tax reforms and examine how these cycles change the composition of national tax systems. Our main findings are as follows. Governments postpone tax rate increases until after elections. The overall tax reform index was around 0.24 standard deviations larger in post-election years than in other years. We also find substantial heterogeneity across tax types, indicating that electoral cycles influence the composition of national tax systems. Our main result is driven by post-election increases in value added and sales tax (VAT) rates and personal income tax rates, which are particularly unpopular among voters. The heterogeneity in electoral cycles across tax types is in line with the argument of "tax salience", suggesting that voters are rationally ignorant about most tax measures and pay attention mostly to policies which directly affect them (e.g. Cabral and Hoxby, 2012; Finkelstein, 2009).

Measuring tax reforms across countries and over time is a challenging endeavor, because tax systems vary greatly across countries (Koester, 2009). While the general

[1]See, for example, Alesina et al. (1997); Alt and Lassen (2006); Shi and Svensson (2006); Potrafke (2010); Katsimi and Sarantidis (2012); Herwartz and Theilen (2014); Castro and Martins (2018).

types of taxes are similar in the group of industrialized countries—including, for instance, personal income taxes, corporate taxes, VAT, and property taxes—tax rates, tax bases and tax exemptions are subject to multifaceted provisions in the legal framework of countries. Hence, a simple comparison of tax rates would give rise to biased assessments when comparing cross-national differences in taxation. In an attempt to provide more granular information on national tax systems and to facilitate the comparison of tax systems across countries, the International Monetary Fund (IMF) compiled qualitative information on tax reforms in OECD countries (Amaglobeli et al., 2018). This information, provided in the form of text entries for countries and years, is based on more than 900 OECD Economic Surveys and 37,000 tax-related news from the International Bureau of Fiscal Documentation. The qualitative nature of the data allows scholars to learn about tax reforms since 1960 in detail, but it does not provide quantitative measures that are readily available for empirical research. In the first part of our paper, we use the qualitative data of the IMF to compile a new quantitative and cross-nationally harmonized data set of tax reforms, the *"Tax Reform Indicators"* (TRI). Our new dataset covers indicators on tax reforms for tax rates and tax bases, along with detailed sub-indices for six types of taxes. These indicators are available for 23 advanced and emerging market economies over the period 1960–2014.

Based on our indices, we document cross-national trends in taxation since the early 1960, allowing us to uncover a more detailed picture of international trends in taxation than based on previous datasets, which typically include data only for individual types of taxation. Our data points to a decline in corporate and personal income tax rates across countries since the early 1980s, and a stark increase in VAT rates and excise tax rates since the mid-1970s. We also observe an increase in social security contributions since the early 1970s, but no distinct patterns regarding property tax rates. Similarly, our tax reform indicators show that tax bases of the corporate and personal income tax have been narrowed, while tax bases of the VAT and excise have been broadened. Examining trends in tax burdens via our aggregated measures, we find a hump-shape development for tax rates, which started to increase in the early 1980s and decreased since the millennium. Tax bases, in contrast, have been steadily narrowed over time since the 1970s.

In the second part of our paper, we relate our indicators on tax reforms to the timing of elections. Our main result, which is stable across alternative specifications, shows that politicians increased tax rates after elections. Our new indicators also allow

us to provide first evidence on heterogeneity in electoral cycles across individual types of taxes. We find that electoral cycles are particularly pronounced for VAT rates and personal income tax rates. Against the background that these types of taxes directly influence voters' disposable income, the results for individual tax types corroborate the political business cycle theories.

Our results are unaffected from government changes and other national fiscal policies measures, e.g. changes in expenditure or debt around elections. Inferences also do not change when we disentangle post-electoral tax reforms of re-elected incumbents and newly elected governments. A key question is whether tax increases have been announced prior to elections, or whether they caught voters by surprise. The theory of rational political business cycles holds that incumbents signal their fiscal competence prior to elections, which would go against electoral promises to increase taxes after elections. An announcement of tax increases would most likely also reduce parties' electoral success. In any event, to address possible anticipation effects, we collect data on tax queries via Google in the countries included in our sample and compare the popularity of tax issues in election years with other years. While tax issues are less popular in election years, the differences in means do not turn out to be statistically significant. Taken together, Google Trends data provides suggestive evidence that goes against pre-election hikes in public attention to tax policies. This result suggests that electoral cycles in taxation are driven by strategic tax reforms of election-motivated politicians.

Contribution to the literature: Our main contribution is to provide harmonized tax reform indicators for six tax types that allow us to study trends in taxation over almost six decades. Relating tax reforms to national elections, we find pronounced political cycles in tax reforms. Our results relate to the empirical literature on political business and budget cycles (e.g., Ben-Porath, 1975; Schuknecht, 1996; Bloomberg and Hess, 2003; Shi and Svensson, 2006; Desai et al., 2007; Potrafke, 2010; Aidt et al., 2011; Brender and Drazen, 2013; De Haan and Klomp, 2013; Aidt and Mooney, 2014; Foremny and Riedel, 2014; Klomp and De Haan, 2016; Baskaran et al., 2015; Dubois, 2016; Bostashvili and Ujhelyi, 2019; Aidt et al., 2020; Potrafke, 2020; Bohn and Sturm, 2021). Some studies specifically focus on electoral motives in tax policies, examining electoral cycles in tax revenues at the national level and tax rates on the local level (Erhart, 2013; Foremny and Riedel, 2014; Alesina and Paradisi, 2017; Sances, 2017;

Lami and Imami, 2019). Little is known, however, about heterogeneity in electoral cycles across types of taxes and, more broadly, on electoral cycles in overall tax reforms on the national level. Our study fills this gap and contributes to the literature in two ways. First, we show that postponing tax increases after elections is a global phenomenon and not confined to individual federal states. Given that the most important tax choices in many countries are made on the national level, our results show that electoral motives have a substantial impact on national tax systems. Second, we provide first evidence on heterogeneity in electoral cycles across individual types of taxes. The analysis uncovers substantial heterogeneity in electoral cycles across tax types suggesting that studies focusing on single tax types are not suitable to describe how electoral motives influence tax policies overall.

We also relate to the literature showing that voters tend to discount the past. When evaluating politicians based on their economic performance, voters seem to consider only the previous one or two years (Fair, 1978, 1982, 1988, 2009). Our results suggest that election-motivated politicians tend to take strategic account of voters' ignorance of the past by postponing tax increases to after elections so that voters are likely to have forgotten the reform when the next election approaches. There is also evidence that this strategic behavior pays off. Previous work has shown that tax reforms impact re-election probabilities of incumbent governments (Chen et al., 2019). Focusing on tax reforms intended to consolidate budgets, the results show that reforms of indirect taxes tend to have higher electoral costs than reforms of direct taxes. Electoral costs also tend to be lower for leftwing than rightwing governments.

We also contribute to the literature on trends in taxation in industrialized countries. So far, most studies investigated reforms in corporate income taxation and tax competition (Devereux and Griffith, 1998; Devereux et al., 2002; Devereux and Griffith, 2003a; Devereux et al., 2008; Arulampalam et al., 2012; Becker et al., 2012; Clausing, 2013; Kawano and Slemrod, 2016; Fuest et al., 2018). Comparable data on tax reforms, particularly for individual tax types and tax bases, has been heavily limited across countries and years. Our new indices on tax reforms are well suited to examine how tax systems have been reformed over the past six decades in industrialized countries and may also be useful for scholars to address other research questions on the causes and consequences of tax reforms.

2 Measuring tax reforms

2.1 Previous measures of tax reforms

Several researchers have compiled datasets on taxes and tax reforms. The OECD Tax Database (2021) provides comparative information on major taxes for OECD and inclusive framework countries. However, the database has two shortcomings: (i) the tax base is missing for most taxes and (ii) coverage is limited regarding the time dimension, including information only for the post-2000 period. The University of Michigan World Tax Database collects mostly personal income tax (PIT) and corporate income tax (CIT) rates for OECD countries from 1960 (PIT) and 1980 (CIT) until the 2000s.[2] The Oxford University Centre for Business Taxation (CBT) Tax Database covers CIT bases and rates for all OECD countries from 1980 to 2017. Although these datasets have set milestones in the analyses of taxes and tax reforms, we are not aware of any tax database that provides comparable data on tax rates and bases for a large sample of countries, tax types, and years.

2.2 A new cross-nationally comparable index of tax reforms

2.2.1 Measuring tax reforms across countries – a new tax reform indicator

Comparing tax systems across countries is notoriously difficult. Tax systems are complex and their economic impact depends on tax rates, tax bases, administrative practices, fines for tax evasion and many other institutional details. Empirical research often needs summary measures which allow for a simple comparison of tax burdens across countries. Which type of summary measure is appropriate depends on the question asked. One example is the international comparison of the corporate tax burden on investment, where King and Fullerton (1983) introduced the concept of the effective marginal tax rate. It measures how the combination of tax rates and tax bases distorts marginal investment in a country. Other examples with a different focus include the concept of effective average tax rate introduced by Devereux and Griffith (2003b) or the labour income tax wedge published regularly by the OECD (see e.g., OECD, 2020).

Our analysis focuses on tax policy changes before and after elections. Here the challenge is that we cannot focus on individual taxes only or on particular economic

[2]The data are no longer updated. All previously collected data are available here: https://www.bus.umich.edu/otpr/otpr/default.asp.

distortions caused by the tax system. We are interested in changes rather than levels of taxation and in principle all taxes are relevant. Hence, our key objective is to represent the entire tax system and its composition at the national level. We are also interested in the magnitude of the tax changes and their significance. At the same time we need a measure which is simple enough to be suitable for the empirical analysis in a panel of countries. To strike a balance between these objectives we develop a new index for the international comparison of tax reforms based on qualitative information on tax reforms provided by the IMF (Amaglobeli et al., 2018).

2.2.2 Collecting qualitative information on tax reforms

The key requirement of our approach is collecting detailed qualitative information about reforms of tax rates and tax bases for as many countries, years, and tax types as possible. Until very recently, detailed cross-country information on the nature of tax reforms was difficult to access. The availability of qualitative information on tax reforms was drastically improved by the launch of the IMF's Tax Policy Reform Database (TPRD), a comprehensive database of tax policy measures which includes 23 advanced and emerging market economies observed between 1930 and 2014 (Amaglobeli et al., 2018). The 23 countries are: Australia, Austria, Brazil, Canada, China, the Czech Republic, Denmark, France, Germany, Greece, India, Ireland, Italy, Japan, Luxembourg, Mexico, Poland, Portugal, Spain, South Korea, Turkey, the United Kingdom and the United States. The dataset covers detailed qualitative information on tax reforms using more than 900 OECD Economic Surveys and 37,000 tax-related news from the International Bureau of Fiscal Documentation.

The innovation of the TPRD is the systematic and granular documentation of the direction of tax rate and tax base changes, along with a qualitative assessment of the IMF on whether a reform has been "major" or "minor". Information is separately available for six tax types: personal (PIT) and corporate (CIT) income taxes, value added and sales taxes (VAT), social security contributions (SSC), excises (EXE), and property taxes (PRO).[3] The dataset also includes information on the announcement and implementation dates of tax reforms. The major advantage of the TPRD is its broad coverage, including qualitative information in areas (e.g. countries, years, tax types, tax bases) for which no time-varying policy indices existed before.

[3]We include SSC when discussing tax types because of convenience and clarity.

2.2.3 Quantifying tax reforms: the Tax Reform Index (TRI)

While the IMF's Tax Reform Database is unparalleled in coverage and detail, its broad qualitative information cannot be readily used in empirical analyses that seek to quantify the causes and consequences of tax reforms. To provide a readily available index, we transfer the qualitative information into a quantitative index of tax reforms. Our index, the "Tax Reform Index" (TRI), provides cross-nationally harmonized measures of tax reforms that are available for 23 countries over the period 1960–2014.[4] We introduce 14 indices for each country, reflecting reforms of tax rates and tax bases for each of the six tax types included in the IMF's Tax Reform Database. We also combine these sub-indices into an aggregate index of tax rate and tax base reforms that measure the extent of reform of the overall tax system.

Let Δs^r_{it} be the change in the tax rate for tax type r, adopted and announced in country i at time t.[5] Consider further that $|\tilde{s}_{it}|$ is the qualitative information included in the IMF's Tax Reform Database about the strength of a reform ("major" or "minor"). Our tax reform index $\mathfrak{S}^r_{it} \in [-2, +2]$ is defined as

$$\mathfrak{S}^r_{it} = \begin{cases} -2, & \text{if } \Delta s^r_{it} < 0 \text{ and } |\tilde{s}_{it}| = \text{"major"} \\ -1, & \text{if } \Delta s^r_{it} < 0 \text{ and } |\tilde{s}_{it}| = \text{"minor"} \\ \pm 0, & \text{if } \Delta s^r_{it} = 0 \\ +1, & \text{if } \Delta s^r_{it} > 0 \text{ and } |\tilde{s}_{it}| = \text{"minor"} \\ +2, & \text{if } \Delta s^r_{it} > 0 \text{ and } |\tilde{s}_{it}| = \text{"major"}. \end{cases} \tag{1}$$

This index provides an intuitive interpretation. The index assumes a value of $+1$ when the tax reform led to a minor increase in tax rates, and a value of $+2$ when there has been a major increase in tax rates. For tax reforms which decreased tax rates, the index assumes the value of -1 for a minor decrease and -2 for a major decrease. The advantage of this coding is that it makes tax reforms more comparable than simply comparing tax rates. Under a given legal tax framework, an increase of, say, two percentage points may either be a minor increase or a major increase. The classification

[4] While the TPRD includes observations since 1930, data on pre-1960 periods is available only for few countries and with large gaps.

[5] A key question is to what time period a tax reform should be assigned. The IMF Tax Reform Database includes information on both the announcement year and the implementation year. In most cases, these years are identical, but we also observe differences between the two. We base our analysis on the announcement year to avoid distorting anticipation effects. Also, the announcement data is useful to examine how election-motivated politicians influence tax policies.

of the extent of the reform requires additional information on legal provisions of a tax system, which are accounted for by the IMF's qualitative assessment.

We also code two minor increases as being equivalent to one major increase. The rationale for this strategy is that two minor increases of the same tax type in the same year have the same reform character as one major increase. Clearly, such a coding rule reflects views on the nature of tax reforms, and researchers may have diverging views about the relative importance of several minor increases compared to one major increase. To address this concern, our indices come in three variants, which differ in the normalization rule applied to measure the extent of tax reforms. Depending on their research question, scholars will find either the normalized, the reduced or the non-normalized version better suited to match their purposes. The reduced variant codes each reform as a single tax change with equal weights, regardless of the scope of the reform or whether there are multiple reforms in a given year. The scale of this version is $[-1, +1]$. The non-normalized versions put no constraints on the upper and lower bounds, adding multiple minor ($+1$) and major ($+2$) increases that occurred in the same period. Hence, compared with our normalized benchmark index $\mathfrak{S}^r_{it} \in [-2, +2]$ defined in Equation (1), the non-normalized variant $\mathfrak{S}^r_{it} \in \mathbb{Z}$ is more volatile. While this version offers greater scope to account for extreme reforms, it bears the risk that results in empirical estimations are driven by extreme outliers. The versions also differ in their definition of the very nature of a tax reform. When the research question is whether or not there has been a (major) tax reform in a given year, the normalized version is better suited for empirical work. Instead, when the research question requires having estimates for the extent of multiple reforms, the non-normalized version is the better-suited alternative.

In principle, there may be reforms of several tax types in a given year, and these reforms may not be independent. Hence, for some empirical analyses, researchers might be interested in the extent to which the overall tax system has been reformed. We built our composite tax reform index $\mathfrak{S}^A_{it} \in [-2, +2]$ by aggregating the six sub-indices to a uni-dimensional index of tax reform via

$$\mathfrak{S}^A_{it} = \frac{1}{6} \sum_{r=1}^{6} \mathfrak{S}^r_{it},\ r = \{1, \ldots, R\}, \tag{2}$$

where $r = 1, \ldots, 6$ denote the six tax types. Again, there might be good arguments to scale the final index on the interval $[-2, +2]$, to code a reduced version irrespective

of the scope of reforms, or to allow the index not to be confined by a pre-defined interval. We provide the two versions of the aggregate index, but we believe that the constrained index is more suitable for our research question. We apply the same logic to obtain indices to measure changes in tax bases.

Assessing trends in taxation: Our indices reflect reforms of the tax system, and may hence be interpreted as the *change* of the tax burden at a given point in time. For many analyses, however, researchers might be interested in international trends in taxation. Such trends can be obtained by accumulating the index values $\mathfrak{S}^r_{it}$ over time

$$\mathfrak{S}^r_{iT'} = \sum_{t=1960}^{T'} \mathfrak{S}^r_{it},\ t = \{1960, 1961, \ldots, T'\}, \tag{3}$$

where $\mathfrak{S}^r_{iT'}$ is the accumulated index value at time T'. This index value shows the tax burden of a tax system relative to the base year 1960. The accumulated version also allows comparisons of trends between countries, as all accumulated indices are, by construction, indexed to $1960 = 0$.

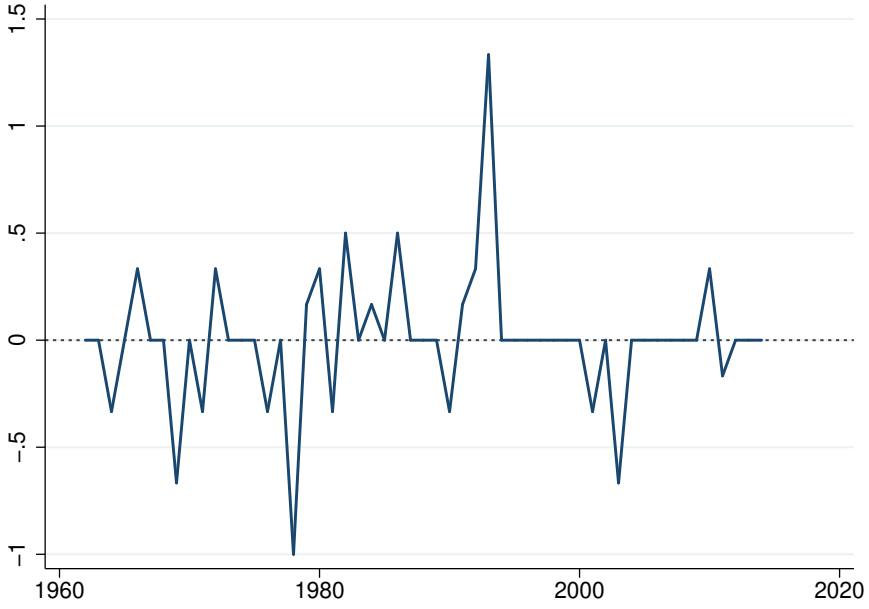
Example: Tax reforms and trends in the United States, 1960–2014: Figure (1) shows the Tax Reform Index, plotting the aggregate Tax Reform Index $\mathfrak{S}^A_{it}$ for the United States (upper panel) and the accumulated version of the index $\mathfrak{S}^r_{iT'}$ (lower panel). This example shows the logic of our index and compares the Tax Reform Index to the time-accumulated version of the index that allows for trends in taxation over time.

By construction, the Tax Reform Index oscillates around the zero line, pointing to reforms in the US tax system (upper panel). Cumulating these changes over time, we arrive at trends in taxation (lower panel). We observe that the Tax Reform Index decreases at the beginning of the observation period, which indicates a negative trend in the tax burden during the 1970s. This trend reversed during the 1990s, when the US tax system became more contractionary than in 1960.

2.3 International trends in taxation: A comprehensive picture

Previous tax indices were mainly confined to information on tax rates for private and corporate income taxes, and were heavily limited in the included number of countries

Figure 1 ILLUSTRATION OF THE TAX REFORM INDEX: TAX REFORMS AND TRENDS IN TAXATION IN THE UNITED STATES, TAX RATES, 1960–2014.



(a) Aggregate Tax Reform Index (TRI) for the United States.

(b) Aggregate Tax Reform Index (TRI) for the United States, accumulated over time

Notes: The figure illustrates the aggregate Tax Reform Index $\mathfrak{S}_{it}^{A}$ (tax rates) for the United States (upper panel) and the accumulated version of this index $\mathfrak{S}_{iT'}^{r}$ to assess trends over time. For the accumulated version, each point in time $T^{'}$ represents the sum of the Tax Reform Index $\mathfrak{S}_{it}^{A}$ over all available periods prior to $T^{'}$.

and years. Using our new indices on tax reforms, we portray cross-national trends in taxation from the early 1960s to the mid 2010s.

2.3.1 Trends in aggregate tax rates

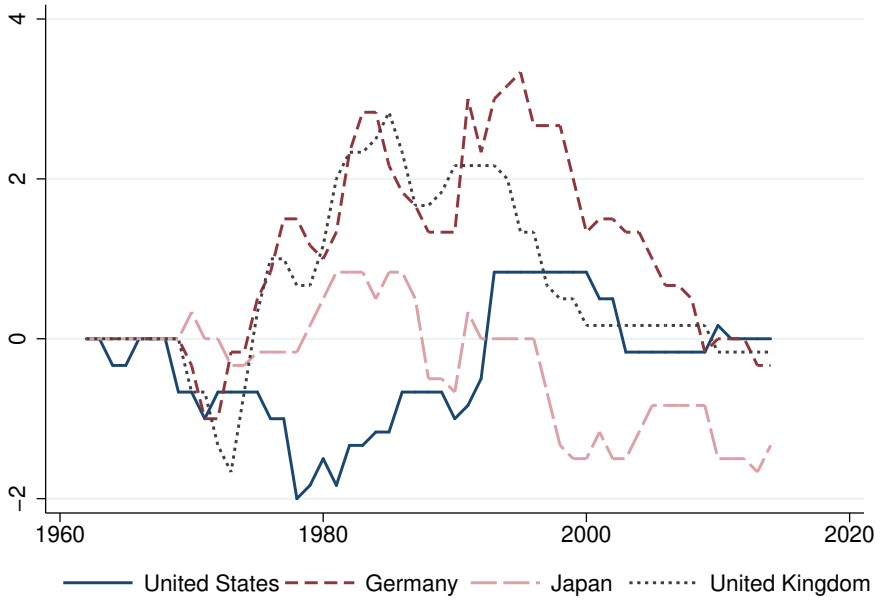
Figure (2) compares trends in taxation in individual countries (Panel a) and for groups of countries (Panel b). The figure shows that there is heterogeneity in how tax systems have developed across the United States, Germany, Japan, and the United Kingdom. The average Tax Reform Index for tax rates in the United States decreased during the 1970s, remained at a low level compared to other advanced economies during the Reagan administration in the 1980s, and approximated its initial level in the 1990s during the presidency of Bill Clinton. The average Tax Reform Index for tax rates started to decrease again under George Bush and remained on a quite constant level since. In contrast, we observe a positive trend in the average Tax Reform Index for tax rates in Germany and the United Kingdom from the 1960s until the mid-1990s, and a substantial decline that lasts until the end of our sample period. Trends in Japan are similar, but increases and decreases are less pronounced.

Despite substantial heterogeneity in the development of tax rates across countries, we observe distinct trends in taxation when examining sample means and averages of the Tax Reform Indices across the whole sample, the European Union and the Euro Area (Panel b). After a slight decline in the 1960s, the average Tax Reform Index for tax rates increased during the oil crises in the 1970s and reached their peak in the mid-1980s. After a substantial decline in the second half of the 1980s, the average Tax Reform Index for tax rates increased again during the early 1990s. From the late 1990s until the Financial Crises of 2007-2008, the average Tax Reform Index for tax rates decreased substantially. The average Tax Reform Index for tax rates started increasing again after the Great Recession initiated by the Financial Crisis.

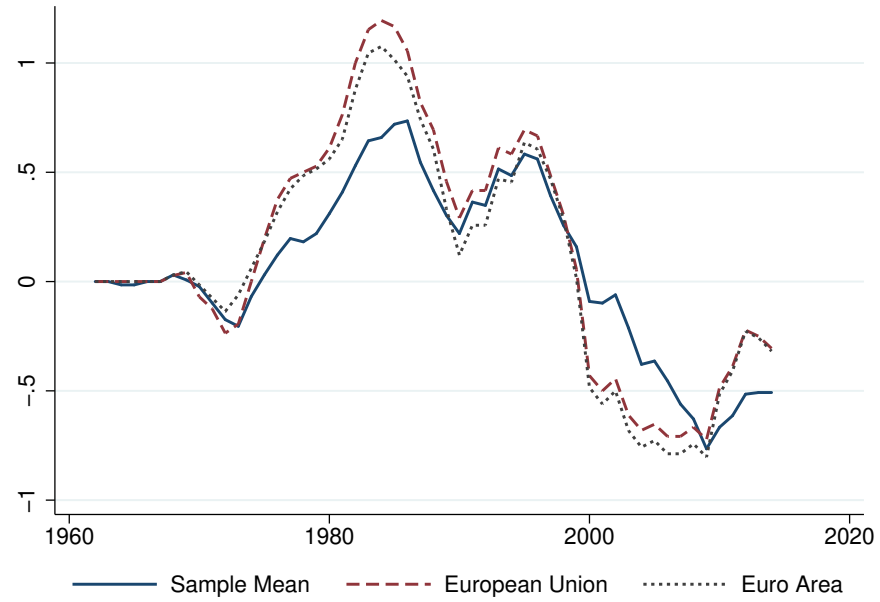
2.3.2 Trends in the composition of tax systems

Our aggregate tax index adds sub-indices for tax types using equal weights. A major advantage of our dataset is that it includes separate indices for six major types of taxation. There may well be heterogeneity in how tax rates for individual tax types have developed. Figure (3) shows trends in taxation for individual tax types considering the sample mean, the European Union and the Euro Area. The figures indicate that there has been a major change in the composition of tax systems and clear differential

Figure 2 TRENDS IN TAX RATES, SELECTED COUNTRIES AND SAMPLES IN COMPARISON, 1960–2014.



(a) Trends in taxation, the United States, Germany, Japan, and the United Kingdom.



(b) Trends in taxation, sample mean, European Union and Euro Area.

Notes: The figure illustrates the accumulated version of the aggregate Tax Reform Index ($\mathfrak{S}^{A}_{iT'}$) for tax rates to compare trends in taxation between the United States, Germany, Japan, and the United Kingdom over time. For the accumulated version, each point in time $T^{'}$ represents the sum of the Tax Reform Index $\mathfrak{S}^{A}_{it}$ over all available periods prior to $T^{'}$.

trends between tax types. Starting in the 1980s, there has been a substantial decline in the Tax Reform Index for corporate tax rates and personal income tax rates. This decline is consistent with trends reported for corporate income tax rates in prior studies (e.g. Devereux et al., 2008; Heinemann et al., 2010). The United States are a prime example for the decrease in personal income tax rates during the 1980s. President Ronald Reagan reduced the top income-tax rate from about 70 percent when he entered office in the early 1980s to 28 percent in 1986 (e.g. Souleles, 2002).

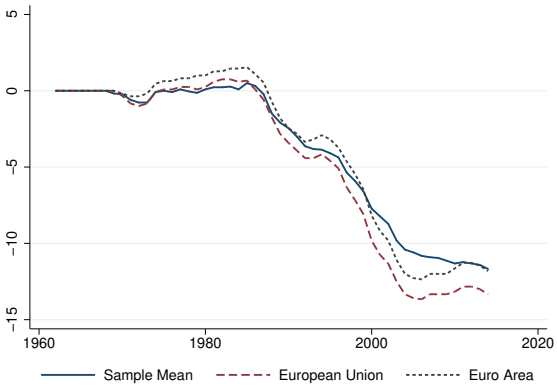
The decrease in income tax rates was compensated by a stark increase in tax rates for VAT and excises. While there is a substantial increase in the Tax Reform Index for both tax types observable for the whole sample and for European countries, the rise in VAT rates after the Financial Crises was particularly strong in the European Union and the Euro Area. In a similar vein, social security contributions increased between the early 1980s and the early 2000s, but there are diverging trends between the sample mean and European countries since the turn of the millennium. There are no distinct trends regarding property tax rates.

2.3.3 Trends in tax bases

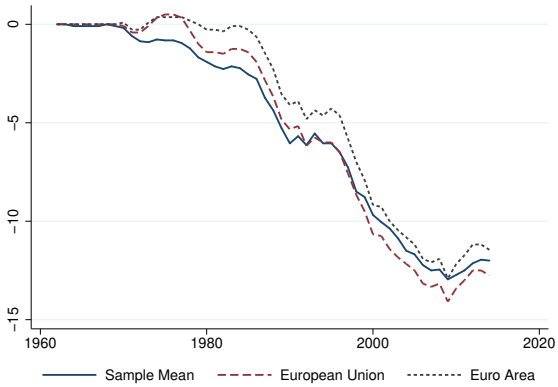
Figure (B-1) in the appendix shows trends in taxation for tax bases. Panel (a) shows that tax bases have become smaller in the United States, Germany, Japan and the United Kingdom. This development was particularly pronounced in the United Kingdom and less so in Japan. Panel (b) considers trends of the whole sample, the European Union, and the Euro Area. For all groups of countries, we observe clear trends towards more narrow tax bases.

Similar to the results for tax rates, the composition of tax systems regarding tax bases changed over time. While tax bases became smaller particularly for personal and corporate income taxes, tax bases broadened for VAT and excises, mirroring the development for tax rates. Again, we observe no distinct trends for property taxes. Tax bases underlying social security contributions narrowed, constituting the only tax type for which tax bases and tax rates have developed differently.

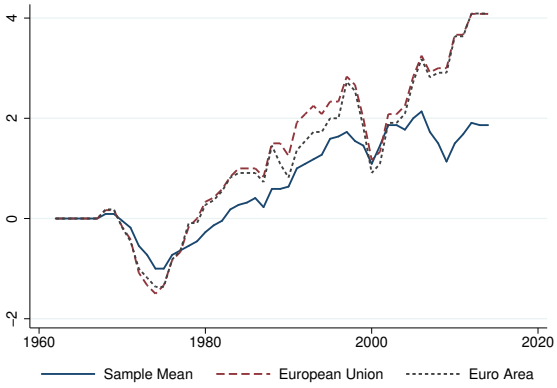
Figure 3 TRENDS IN INDIVIDUAL TAX TYPES, TAX RATES, 1960–2014.



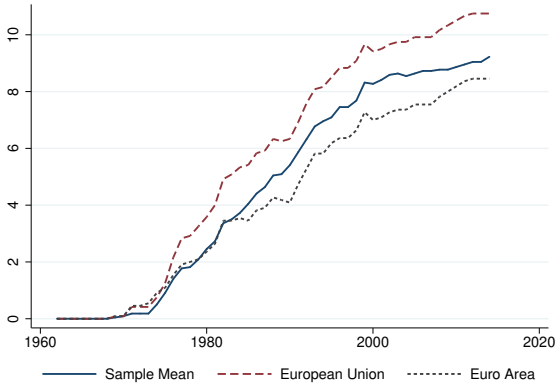
(a) Corporate tax rates.



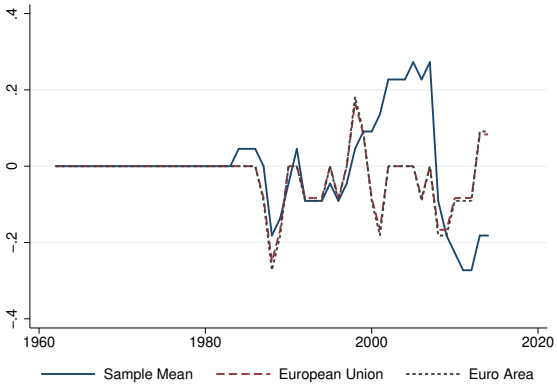
(b) Personal income tax rates.



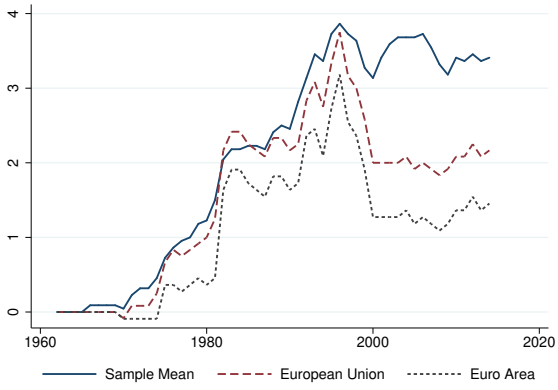
(c) Value added tax rates.



(d) Excise tax rates.



(e) Property tax rates.



(f) Social security contributions.

Notes: The figure illustrates the accumulated version of the Tax Reform Index ($\mathfrak{S}^{A}_{iT'}$) for individual tax types to compare trends in taxation between the sample mean, the European Union, and the Euro Area over time. For the accumulated version, each point in time $T^{'}$ represents the sum of the Tax Reform Index $\mathfrak{S}^{A}_{it}$ over all available periods prior to $T^{'}$.

3 Changes in taxation after elections

3.1 Hypotheses

The theories on political business cycles describe that politicians implement expansionary policies such as increasing public expenditure before elections to maximize electoral success (Nordhaus, 1975; Rogoff and Sibert, 1988; Rogoff, 1990). The traditional theories on political business cycles focused on demand-increasing policy measures that are conducted prior to elections to boost the economy, affecting macroeconomic variables such as GDP growth, unemployment, and inflation (Nordhaus, 1975; Lindbeck, 1976). Evidence for political business cycles in macroeconomic variables is, however, mixed (Alesina et al., 1997; Potrafke, 2012; Drazen, 2018). In a similar vein, the traditional models of political business cycles have been criticized for the assumption of non-rational and myopic voters. A subsequent generation of political business cycle models abandoned the assumption of irrationality and focused on information asymmetry between politicians and voters instead (rational political business cycle). These models examine fiscal choices in a model in which politicians signal their competence via fiscal policies, resulting in a distortion of fiscal policies around elections (e.g. Rogoff and Sibert, 1988; Rogoff, 1990; Persson and Tabellini, 2002). The key difference compared to the traditional political business cycle models is that the rational political business cycle theories predict distortions in fiscal policies (e.g. spending, revenues, and deficits) rather than in macroeconomic indicators around elections. Signaling competence in administering the production of public goods, as in the model of Rogoff (1990), requires supplying a higher level of public goods at constant levels of taxation or by implementing low-tax policies for a given public good provision.[6] The latter strategy is however costly for incumbents because it reduces their fiscal scope when they get re-elected.

Beyond signaling, a key motivation of fiscal policy before elections is to take measures that are valued by the electorate to increase the incumbents' likelihood of re-election. Increases in taxes are particularly unpopular with voters because tax increases affect citizens' after-tax income. Politicians are hence most likely to conduct tax reforms when they are least likely to pay an electoral cost of such reforms. The literature on "political opportunity" is based on the observation that unpopular actions in non-election years are heavily discounted by voters over time (Fair, 1978, 1982, 1988,

[6] On the signalling process see, for example, Garcia and Hayo (2021).

2009; Berry and Berry, 1994; Nelson, 2000) and argues that tax reforms are most likely to be conducted directly after elections.

If electoral incentives are relevant for political decision making, we expect incumbents to signal their competence to the electorate prior to elections by keeping taxes low, for a given amount of public good provision. Following this line of argument, we expect a reduced probability for tax increases prior to elections and a higher probability of tax increases after elections. This electoral cycle in taxation is reinforced if the opposition party wins the election. The newly elected government can justify to raise taxes by claiming that the preceding government did some window dressing about the state of public finances. Such claims may be used strategically but they may also be objectively true when the preceding government, aware of a high probability of losing the election, conducted expansionary fiscal policies to reduce fiscal space for the next government (e.g. Persson and Svensson, 1989).

Taken together, our hypotheses to be tested empirically are:

Hypothesis 1 (H1)**.** *Tax rates increase after elections.*

Hypothesis 2 (H2)**.** *Tax bases expand after elections.*

Some authors argue that salience plays a role, suggesting that voters are rationally ignorant about most tax policy issues and pay attention only to policies which affect them strongly or are easy to understand (e.g. Cabral and Hoxby, 2012; Finkelstein, 2009).). Following the argument of "salience", we expect that electoral cycles in taxation are more pronounced regarding tax types that many voters directly notice. Such tax types include the VAT, which directly increases consumer prizes, and the personal income tax, which influences disposable incomes of a large fraction of the population. We expect such electoral cycles to be less pronounced regarding tax types that affect a lower fraction of the electorate, such as corporate income taxes or property taxes.

3.2 Stylized facts and case studies

We discuss case studies of three tax reforms that are in line with our theoretical hypotheses and describe how we coded the reforms in our harmonized index. We then investigate the extent to which these specific case studies are representative for election-motivated politicians, comparing sample means of tax reforms in election years, years before elections, and years after elections.

Italy 1977: The Italian center-right minority government announced a major tax reform on 1 February 1977. Only seven days later, on 8 February 1977, the standard VAT rate was increased by 2 percentage points from 12% to 14%. An extra bracket was introduced for the reduced VAT rate which was taxable at 12%.[7] The increased tax rate was further increased by 5 percentage points from 30% to 35% (European Commission, 2020).

The IMF Tax Reform Database records the announced change in the Italian VAT rate as a major increase. Therefore, the index for the VAT assumes the value 2 for Italy for the year 1977.

United States 1993: The 103rd US Congress enacted the Tax Reform Act of 1993 and then-President Bill Clinton signed it into law. The tax reform contained major provisions for individuals and companies. The most substantial changes concerned the PIT and CIT rates. The Tax Reform Act of 1993 increased the PIT rate by 5 percentage points from 31% to 36% for taxable income between 140,000 and 250,000 USD and by 8.6 percentage points to 39.6% on incomes over 250,000 USD (Feldstein, 1995). It also increased the CIT rate for corporate income over 10 million USD: the tax rate on income between 10 and 15 million USD increased by 1 percentage point from 34% to 35%, the tax rate on income between 15 and 18.33 million USD increased by 3 percentage points from 34% to 38%, and the tax rate on income over 18.33 million USD increased by 1 percentage point from 34% to 35% (Taylor, 2003).

The IMF Tax Reform Dataset records the announced changes in the US PIT and CIT rates as major increases. Therefore, the tax reform indices for the PIT and the CIT assume the value 2 for the United States for the year 1993.

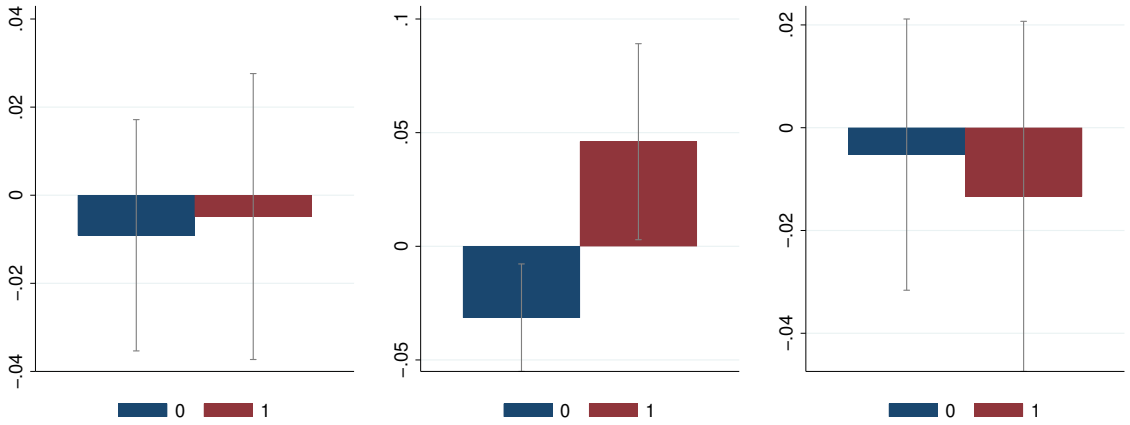
Germany 2006: On 19 May 2006, the German parliament (*Deutscher Bundestag*) voted for the largest tax increase since 1949 (Spiegel, 2006). The christian conservatives (*CDU & CSU*) and the social democrats (*SPD*) jointly agreed to increase the VAT rate by 3 percentage points from 16% to 19% starting 1 January 2007.[8]

During the 2005 election campaign, CDU-candidate Angela Merkel proposed a 2 percentage points increase in the VAT rate. The SPD promised that they would not support any VAT rate increase and campaigned with the now infamous slogan: *"Mehrw-*

[7] The total number of tax brackets for the reduced VAT rate was 4 before the reform. Tax rates of the brackets were 1%, 3%, 6%, and 9%.

[8] The reduced VAT rate increased by 2 percentage points from 5% to 7%.

Figure 4 CHANGES IN TAX RATES AND ELECTION DATES, AGGREGATE TAX REFORM INDEX, TAX RATES, OECD COUNTRIES, 1960–2014.



(a) Year of the election **(b)** Year after the election **(c)** Year before the election

Notes: The figure shows changes in tax rates implied by the aggregate Tax Reform Index ($\mathfrak{S}^{A}_{iT'}$) in election years and non-election years (see section 2 for a detailed description of the index). When comparing changes in tax rates in election years (Figure 4a), label "1" refers to years with elections, while "0" refers to non-election years. When comparing changes in years before (Figure 4c) and after (Figure 4b) elections, "1" refers to the pre-election years or the post-election-years. Vertical lines indicate 95% confidence intervals. All figures use the full set of observations for countries and years included in our dataset.

ertsteuer, das wird teuer." (engl.: "VAT rate [increase] will be expensive)". The compromise was a VAT rate increase by 3 percentage points.

The IMF Tax Reform Database records the announced change in the German VAT rate as a major increase. Therefore, the tax reform index for the VAT assumes the value 2 for Germany for the year 2006.

Comparing sample means: The case studies are expository examples of tax changes after elections. To provide a more general overview on the unconditional correlation between tax changes and election dates, Figure (4) shows the overall Tax Reform Index for tax rates in election and non-election years (left panel), post-election and no post-election years (center panel), and pre-election and no pre-election years (right panel). The figure uses data for our baseline sample of OECD counties with established democracies. The difference in the overall Tax Reform Index for tax rates in election years (-0.005) and non-election years (-0.009) lacks statistical significance.

The results suggest, by contrast, that increases in tax rates were postponed until

after elections: in post-election years, the overall Tax Reform Index for tax rates was 0.046 points. In all other years, the overall Tax Reform Index for tax rates was -0.031 points on average. This difference is statistically significant at the 5% level. Overall tax rates seemed to decrease in pre-election years; the mean of the overall Tax Reform Index for tax rates is -0.013 (right panel), whereas the mean of the overall Tax Reform Index for tax rates is -0.004 in all other years. The difference in means does, however, not turn out to be statistically significant for pre-election years. The patterns do not change when we compare election dates and tax reforms using the full sample of countries which also covers emerging market economies with less established political institutions (Figure B-3 in the appendix).

3.3 Empirical strategy

The unconditional correlations reported in Figure (4) suggest that tax rates on average increase after elections, implying that policymakers postpone tax increases after elections to avoid unfavourable effects on electoral outcomes. However, these unconditional correlations may be influenced by the large cross-country heterogeneity in national tax systems documented in Section (2.3). Also, our descriptive statistics revealed pronounced trends in taxation over time. Our empirical strategy addresses the confounding influence of cross-country heterogeneity in tax policies and trends in taxation over time. We follow Foremny and Riedel (2014), estimating variants of the model

$$\mathfrak{S}_{it}^{A} = \gamma E_{it+\tau} + \mathbf{X'}_{it}\boldsymbol{\beta} + \eta_i + \zeta_t + \varepsilon_{it}, \tag{4}$$

where the Tax Reform Index $\mathfrak{S}_{it}^{A}$ of country i at time t is modeled to be a function of the election date $E_{it+\tau}$. We explore temporal dynamics in tax changes around election dates by examining election years ($\tau = 0$), pre-election years ($\tau = -1$) and post-election years ($\tau = 1$). To account for cross-country heterogeneity in taxation, we include fixed effects for countries η_i. These effects also account for all other time-invariant unobserved factors that may correlate with election dates and tax reforms (e.g. cultural norms and socialization, political history, dominant schools of thought, geography, and institutional frameworks). To account for cross-country trends in taxation over time, we include year fixed effects ζ_t. These effects also account for exogenous shocks that similarly affect all countries in the dataset and which may influence taxation (e.g.

economic crises, see Fuest et al., 2022). All unobserved time-varying shocks to taxation are absorbed by the ideosyncratic error term ε_{it}.

Identification: Our parsimonious models of equation (4) consider tax policies separately for election years, pre-election years and post-election years. In our full model specification, we simultaneously take into account the years around elections

$$\mathfrak{S}_{it}^{A} = \mathbf{E'}_{i}\boldsymbol{\delta} + \mathbf{X'}_{it}\boldsymbol{\beta} + \eta_i + \zeta_t + \varepsilon_{it}, \tag{5}$$

where dummy variables for election years, pre-election years and post-election years are included in the vector $\mathbf{E'}$ via

$$\mathbf{E'} = \begin{bmatrix} E_t \\ E_{t-1} \\ E_{t+1} \end{bmatrix} \text{ and } \begin{cases} = 1 & \text{in the election year (0 otherwise)} \\ = 1 & \text{in the pre-election year (0 otherwise)} \\ = 1 & \text{in the post-election year (0 otherwise).} \end{cases} \tag{6}$$

As election dates vary across countries, our approach resembles a "difference-in-differences" framework in which countries with no election in a given year serve as a control group to identify the effect of elections on tax policies in the treatment group of countries with an election (and on those countries in a pre- and post-election year). Threats to the identification come from country-specific omitted factors that are correlated simultaneously with tax policies and the timing of elections. To the extent that these factors are time-invariant over our observation period (such as, for instance, institutional, cultural, historical, geographic or political factors), they are included in the set of country-fixed effects η_i. To the extent that these factors correlate with trends in taxation and period-specific shocks, they are included in the set of period-specific effects ζ_t.

Biases may arise from factors that determine national tax decisions and that are correlated with election dates. In variants of equations (4) and (5), we account for observable time-varying factors that may confound the relationship between election dates and taxation. These factors are stacked in the matrix $\mathbf{X'}_{it}$ and include government ideology, the growth rate of real per capita GDP, globalization, and the quality of political institutions.

The partisan theories describe that leftwing and rightwing governments implement fiscal policies to gratify the needs of their constituencies. Leftwing governments are

expected to cater low-income citizens and favor income redistribution; rightwing governments are expected to cater high-income citizens and favor less income redistribution than leftwing governments (Hibbs, 1977; Chappell and Keech, 1986; Alesina, 1987; Schmidt, 1996; Potrafke, 2017, 2018). Leftwing governments have been shown, for example, to set higher corporate tax rates than rightwing governments (Osterloh and Debus, 2012).

Tax reforms may also be driven by a country's past macroeconomic performance (see, e.g., Castanheira et al., 2012). On the one hand, tax increases may face less political headwinds in times when the macroeconomic performance is favourable. On the other hand, tax increases may be inevitable if spending increases in recessions have raised the budget deficit. To account for these mechanisms, our model includes the growth rate of real per capita GDP.

Globalization is likely to influence taxation policies (Jha and Gozgor, 2019). The question is how. The race-to-the-bottom hypothesis describes that globalization puts pressure on national governments: systems competition gives rise to decreasing tax rates (Sinn, 1997, 2003). By contrast, when citizens demand higher social insurance during globalization, governments need to increase public expenditure and may want to increase tax revenues. On the globalization-welfare state nexus see, for example, Schulze and Ursprung (1999) and Potrafke (2015).

The main hypothesis underlying the electoral cycle theory is that self-interested politicians have incentives to pursue expansionary fiscal policies before elections and to postpone contractionary policies until after the elections. Leeway for such practices is higher in countries with weaker political institutions.

Our Tax Reform Index is available for a total of 23 advanced and emerging market economies. Data on elections is missing for China among these 23 countries. Our benchmark estimates are based on the 16 democratic OECD and/or EU-member countries included in Armingeon et al. (2020) to compare our results with previous studies on electoral cycles that were based on OECD countries with established political institutions. In a second step, we enlarge our analysis to cover the full sample of 22 countries.

Equations (4) and (5) test a reduced form of electoral cycle models by examining whether tax reforms are determined by election dates. Following many previous studies, we do not aim to explicitly test the (rational) political business cycle theories, as such a test is difficult and would require having a measure for (unobserved) government

competency (e.g. Kneebone and McKenzie, 2001).

3.4 Data description

Election data: Our main election data comes from the "Comparative Political Data Set 1960-2018" compiled by Armingeon et al. (2020). This dataset includes information for 16 of the 22 countries included in our sample. For the analysis of our full sample, we enlarge the election dataset with information provided in the Database of Political Institutions 2020 (Scartascini et al., 2021).

Data for control variables: Data on real per capita GDP comes from the Penn World Tables version 9.1 (Feenstra et al., 2015). To measure government ideology, we update the index of Potrafke (2009) that assumes values between 1 (strong rightwing government) and 5 (strong leftwing government). For globalization, we employ the KOF Globalisation Index compiled by Dreher (2006) and Gygli et al. (2019). Political institutions are measured using the continuous democracy indicator of Gründler and Krieger (2021, 2022). We also code government changes using information provided in the Database of Political Institutions 2020 (Scartascini et al., 2021). Data on additional fiscal measures (expenditure and public debt) is taken from the IMF's International Financial Statistics database.

Sample of established democracies: We distinguish between two samples of countries. Our benchmark sample includes "established democracies", defined as countries that have been OECD members before the fall of the Iron Curtain. The focus on established democracies addresses the argument that political incentives to adjust the policy-mix around elections to increase re-election prospects should be larger the higher the political power of the electorate is. We compare our results with the full sample that also includes countries with less developed democratic institutions.

3.5 Baseline results

Table (1) presents our baseline results. The main result is that tax rates increase after elections, but not prior to elections or during the election year. The parameter estimates of the election year and pre-election year variables are not statistically distinguishable from zero—both when we include them individually (columns I and

Table 1 TAXES AND ELECTIONS—BASELINE-RESULTS, TAX RATES

Dependent variable: Tax Reform Index (aggregated, tax rates), $\mathfrak{S}_{it}^{A}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	0.000926 (0.03)			0.0384 (1.04)
Post-Election		0.0717*** (3.30)		0.0874*** (3.25)
Pre-Election			-0.0151 (-0.43)	0.00824 (0.19)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.138	0.146	0.138	0.147
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

*** Significant at the 1 percent level

III) and when we estimate the full model specification (column IV). By contrast, the parameter estimate of the post-election year variable is statistically significant at the 1% level ($t = 3.30$) in columns (II) and in the full model specification reported in (IV). Numerically, the parameter estimate on the post-election dummy in the parsimonious model suggests that the overall Tax Reform Index for tax rates was 0.0717 (column II) points higher in post-election years than in other years included in our sample. In the full model specification, the parameter estimate slightly increases, suggesting that the Tax Reform Index was 0.0874 (column IV) points higher in post-election years than in other years that were no election or pre-election years. Considering the distribution of the variables, the estimated coefficients suggest that the increase in the overall Tax Reform Index for tax rates was around 0.24 standard deviations larger in post-election years than in other years.

In Table (A-2) in the appendix, we provide complementary results for the overall

Tax Reform Index for tax bases. The results do not provide any evidence for a political business cycle in tax bases.

Taken together, our baseline results suggest that election-motivated politicians influenced tax policies around elections. The results also show that it is important to distinguish between changes in tax rates and bases. While we find an economically and statistically significant increase in the overall Tax Reform Index for tax rates after elections, similar inferences cannot be drawn regarding the overall Tax Reform Index for tax bases.

3.6 Robustness

Observable confounding factors: A concern may be that the results are driven by time-varying confounding factors. In Table (A-3), we control for observable factors that may be simultaneously correlated with tax policies and elections. Potential confounders include the growth rate of real per capita GDP, government ideology, globalization, and political institutions (see Section 3.3). Including these controls results in a decline in the number of observations. We observe that, first, estimating the baseline model using the reduced number of observations does not change the inferences and, second, including the controls also does not change the results.

US midterm elections: Our benchmark election dummy follows the definition of Armingeon et al. (2020) and includes mid-term elections for the United States. The results are basically identical when we exclude US midterm elections (see Table A-4 in the appendix).

Jack-knife analysis: A concern about our benchmark estimates is that the results may be driven by individual countries. To examine whether outliers influence our results, Table (A-5) in the appendix reports results from a jack-knife analysis which re-estimates the baseline model while gradually excluding observations for each country. Doing so does not change the inferences.

Non-normalized index of tax reforms: Our estimates are obtained based on the tax reform indices that are normalized on the interval $[-2, +2]$. The motivation for this choice is two-fold. First, our research question is whether we observe tax reforms before and after election dates. Hence, we are interested in the occurrence of any

reform and not in the occurrence of multiple reforms. Second, we want to rule-out that the results are driven by outliers. For instance, a series of reforms led the sub-index for personal income taxation to assume values of 6 in Canada (1985) and the United Kingdom (1976) and the sub-index for value added taxation to be -10 in France (2000) and -5 in Spain (1999). The total number of observations outside the interval $[-2, +2]$ is, however, small for each sub-index.[9] Inferences regarding the electoral cycle do not change when we replace the non-normalized index with the normalized index.

Reduced version of our tax reform index: Another methodological concern regarding the coding scheme of our indices may refer to the IMF's classification of "minor" and "major" reforms. To alleviate concerns about misclassifications in the scope of the reform, our reduced variant of the tax reform index codes each year with any decrease in tax rates as -1, each year with any increase in tax rates as $+1$, and zero otherwise. Using this reduced variant as the dependent variable does not change the inferences (see Table A-6 in the appendix), but as expected, we observe a change in the size of the estimated parameters.

Electoral cycles in emerging market economies: Our tax reform indices are available for a total of 23 countries, including 16 democratic OECD and/or EU-member countries covered by Armingeon et al. (2020), as well as Brazil, China, the Czech Republic, India, Mexico, South Korea, and Turkey. Our baseline results are obtained using the 16 countries included in Armingeon et al. (2020) to examine electoral cycles in established democracies with strong political institutions. In Table (A-7), we re-estimate our baseline model for the full sample of countries. This analysis excludes China, where the Database on Political Institutions does not report a single election during the observation period. Exploiting the full sample of countries and years does not change the inferences. Using the broader set of countries, however, yields larger estimated parameters and lower standard errors.

Early elections: Election-motivated politicians may well have less time to manipulate economic policies and outcomes when elections are called early than when elections

[9]For all 1,166 observations for which data on tax reforms is available, the following number of observations is outside the normalized interval $[-2, +2]$: corporate income tax (48), personal income tax (59), excises (27), value added and sales tax (31), property tax (2), social security contributions (23). Hence, the share of observations outside the constrained interval is less than 5% for each index.

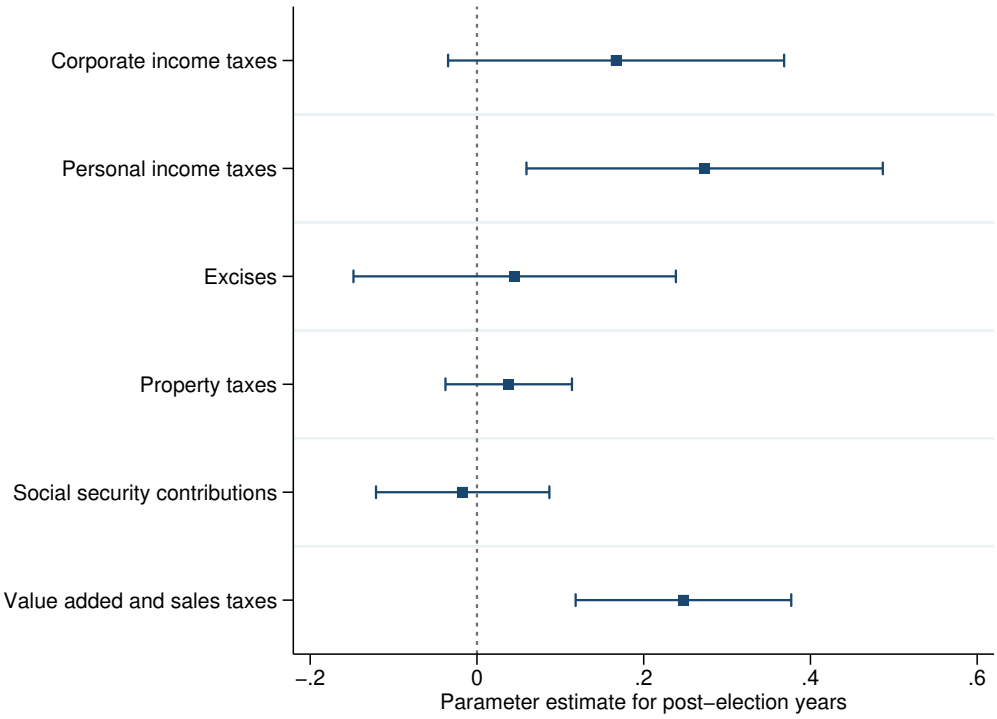
take place on their scheduled date. Scholars therefore disentangle effects of regular and early elections (Shi and Svensson, 2006; Potrafke, 2010). Our dependent variable is based on announcements of tax reforms and not the reforms' implementation dates. It is therefore conceivable that election-motivated politicians influence tax reforms also before early elections. We use official government documents to code a dummy variable that is 1 if an election took place early (and zero otherwise), building on the early election data by Potrafke (2010, 2020). Our baseline sample includes 232 elections, 93 among them were called early (about 40%). We disentangle regular and early elections in Table (A-8) in the appendix. The results indicate that election-motivated politicians postponed tax increases to after elections, regardless of whether elections take place regularly or were called early. The estimated parameters for both types of elections are similar in size (0.0866 for regular elections and 0.0721 for early elections).

3.7 Heterogeneity across tax types

In Tables (A-9)–(A-14) in the appendix, we re-estimate our benchmark model of Table (1) for the individual tax types. The key results are shown in Figure (5), plotting parameter estimates for post-election years and 90% confidence intervals for the extended specification that includes pre-election years, election years, and post-election years (columns IV of the tables in the appendix). The results show that the overall postponement effect is driven by value added and sales taxes (VAT) and, to a lesser extent, by personal income taxation. Regarding the VAT rate, the parameter estimate of the post-election year variable is statistically significant at the 1% level in columns (II) and (IV) and indicates that the Tax Reform Index for the VAT rate was around 0.34 standard deviations larger in post-election years than in other years.

In a similar vein, the Tax Reform Index for the PIT rate was higher in post-election years, delivering a parameter estimate that is statistically significant at the 5% level (Table A-10). The Tax Reform Index for social security contributions was lower in election years (Table A-14). The parameter estimates of the election year variable have negative signs and are statistically significant at the 5% level in column (I) and at the 10% level in column (IV). The estimates suggest that the Tax Reform Index for social security contributions was by around 0.18 standard deviations lower in election years than in any other years. The results do not change when we perform the robustness checks conducted in Section (3.6) for each of the tax types. Regarding corporate income taxation (Table A-9) and property taxation (Table A-13) we do not

Figure 5 HETEROGENEITY ACROSS TAX TYPES



Notes: The figure shows parameter estimates for post-election years (indicated by blue boxes) and 90% confidence intervals (indicated by blue lines) for the full model specification (equation 5) that includes pre-election years, election years, and post-election years for identification. The numerical values are reported in the full model specifications presented in columns IV of Tables (A-9)–(A-14 in the appendix). Detailed results for all specifications including the parsimonious model specifications can be found in Tables (A-9)–(A-14) in the appendix.

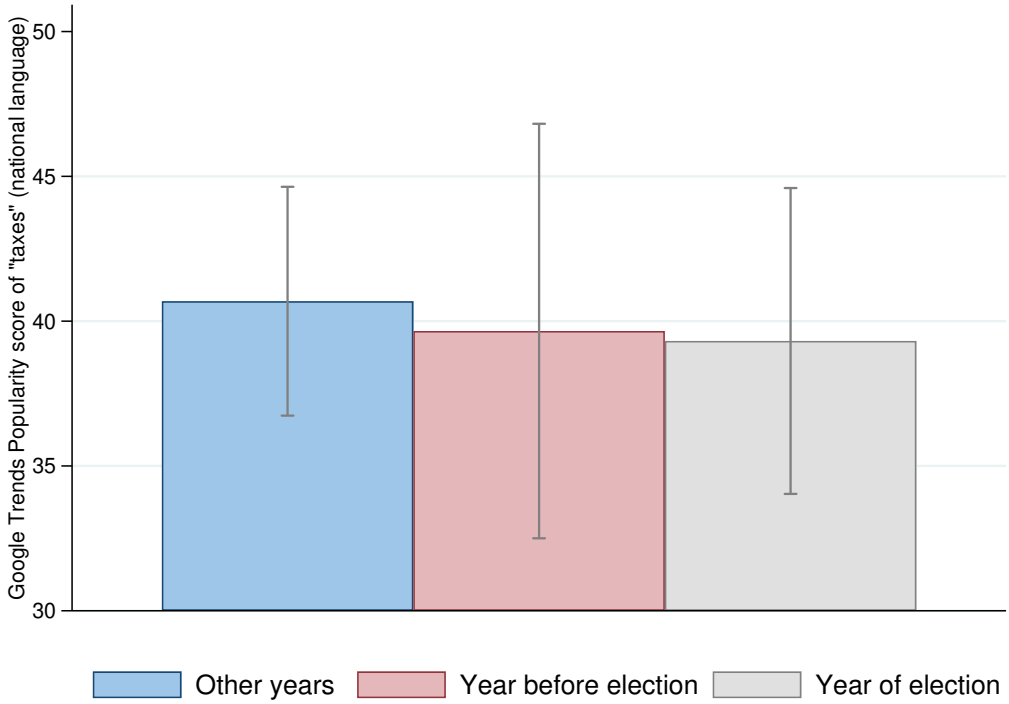
find a strategic manipulation around elections.

The estimates for individual tax types emphasize the advantages of our indices, providing more granular results about the origin of the strong post-election effects. Such effects could not be uncovered with previous tax indices, which do not allow for a similar in-depth examination of tax changes after elections.

3.8 Election promises and pre-election tax announcements

The observed change in tax policy may simply reflect realizations of policies that have been announced prior to the election date. Our tax reform indices are designed to tackle the confounding influence of potential pre-electoral promises and announcements

Figure 6 PUBLIC ATTENTION TOWARDS TAXATION POLICIES AROUND ELECTIONS, GOOGLE TRENDS POPULARITY SCORE



Notes: The figure shows how public attention towards tax policies has developed around elections, plotting Google Trends Popularity Scores for election years, pre-elections years, post-election years and other years. Data is extracted from Google Trends; the popularity scores refer to searches that have been conducted in the official language of the respective countries in the sample. The figure includes all years that are covered by Google Trends since 2004.

of politicians. Our tax reform index is coded to reflect a change in policy in the period when the tax reform has been announced, not in the period when it became legally binding. This coding scheme guarantees that the index captures unanticipated tax changes and hence helps disentangling post-election changes from pre-election announcements. A related motivation for this coding scheme is that economic policies usually give rise to adjustments of labor market and investment decisions well before they become legally binding.

It may also be the case that tax increases after elections reflect election promises made during the election campaign. If election campaigns would have been coined by discussions about tax policies, we would expect greater public attention towards such

policies during pre-election years and election years. We use data from Google Trends to examine the popularity of tax policies around elections, collecting Google Trends popularity scores for all countries included in our sample and all sample years that are covered by Google Trends since its launch in 2004. Popularity scores refer to search queries in the official language of our sample countries and are coded between 0 (low popularity) and 100 (high popularity).

Figure (6) shows popularity scores for the years around elections and shows that tax policies have not been more popular in Google searches in pre-election and election years compared to other years. This result provides suggestive evidence that, on average, tax policies have not been major topics in election campaigns in our sample and speaks against potential biases initiated by anticipation effects.

The minor popularity of tax policies around elections notwithstanding, one may also want to examine in detail whether changes in tax rates after elections have been announced in the party platforms. Clearly, it is unlikely that politicians announce tax increases in a pronounced manner before elections. The models on political business cycles describe that incumbents signal their fiscal competence to voters prior to elections, which speaks against announcements of tax increases prior to elections (see section 3.1). To signal competence, it is more likely that politicians promise tax decreases or promise to not increase taxes after elections. If so, our results would suggest that politicians have not fulfilled their pledges. Compiling data on pledges across countries is quite demanding because doing so requires expertise about the individual political systems, institutions and language skills because party platforms have been available in the countries' individual languages. In a team of researchers from individual industrialized countries, Thomson et al. (2017) have examined the extent to which politicians have fulfilled their pledges. The data by Thomson et al. (2017) disentangle tax policy pledges for six out 12 countries. Among those six countries, our sample only includes Canada, Ireland, the United Kingdom and the United States, which are too few to be examined in our panel data model.

3.9 Incumbents versus new governments

Incumbent governments have incentives to postpone tax reforms to after elections in order to avoid adverse effects of unpopular policies on their electoral success. However, new governments can influence tax systems only after they have been elected into office. In section (3.1), we describe our main hypotheses regarding tax reforms around

elections, emphasizing that new governments are likely to reinforce electoral cycles in taxation. However, a concern about our results may be that the estimated parameters are fully driven by newly elected governments, in which case the estimated parameters for post-election years would not reflect electoral cycles but rather changes in the ruling incumbent. We address this concern by disentangling the results for re-elected incumbents and opposition parties that newly entered office. Results are reported in Table (A-15) in the appendix. Accounting for government changes in our baseline models does not change the inferences. The inferences also do not change when we estimate sub-sample for government changes after elections and elections without government changes. These results corroborate that the benchmark regression outcomes are not biased by systematic differences in tax policies between incumbent politicians and newly elected governments.

3.10 Tax reforms and other fiscal policy measures

The political business cycle theories describe that incumbents increase spending prior to elections to stimulate the economy and to improve the prospects of getting reelected. These theories are complementary to our hypotheses: When governments increase spending before elections, there may be need to consolidate budgets afterwards. One possible alternative for consolidation would be an increase in taxes. When fiscal policies are motivated by electoral considerations, there may be feedback effects between government expenditure and taxes. Examining tax reforms, our benchmark empirical models only reveal a specific part of the strategic manipulation of fiscal policies.

To alleviate concerns about a biasing influence of government expenditure, we re-estimate our benchmark models including data on government expenditure that we collect from the IMF's *"International Financial Statistics"*. Results are reported in Table (A-16) in the appendix. The parameter estimates of our tax reform indicator remain unchanged, both qualitatively and quantitatively, when we include government expenditure as a control variable. Inferences do also not change when we account for the acquisition of public debt around elections.

4 Conclusion

Motivated by the notorious scarcity of a cross-nationally comparable dataset that includes harmonized measures of tax reforms for tax rates and bases for six tax types, we

introduce a new collection of tax reform indicators: The "Tax Reform Index (TRI)". We introduce indicators that are based on the dataset by Amaglobeli et al. (2018). Our sample includes 23 countries: 16 democratic OECD and/or EU-member countries included in Armingeon et al. (2020) and Brazil, China, the Czech Republic, India, Mexico, South Korea, and Turkey. The data is available over the period 1960-2014. The TRI allows us to uncover distinct trends in taxation over the past six decades. The new dataset may be helpful also for other researchers examining the causes and consequences of tax reforms.

How election-motivated politicians influence economic policies has been examined for a long time. Many previous studies have focused on public expenditure and deficits which politicians often increase before elections. Taxation policies are also an excellent measure to be manipulated around elections: politicians are well advised to postpone tax increases after elections. Electoral cycles in taxation have not yet been examined across countries, however, because no suitable data was available. Based on our new dataset, we investigate electoral cycles in taxation on the national level, where the key tax policy decisions take place.

Electoral cycles in taxation policies are to be expected and researchers have been eager in investigating them. Researchers needed, so far, be satisfied with sub-national or incomplete national data to measure taxation policies. Tax systems are complex: they encompass individual types of taxes, and politicians use tax rates, tax bases and exemptions to design tax systems in manifold ways. What is more, tax systems vary a great deal across countries. Consequently, there was no evidence yet describing how electoral motives influence overall taxation policies.

Our results indicate that election-motivated politicians influenced taxation policies around elections. Tax rate increases seemed to be postponed to the year after elections. This effect is strong: it is numerically important – the overall Tax Reform Index was around 0.24 standard deviations larger in post-election years than in other years – statistically significant at the 1 % level and robust to many robustness tests. Election-motivated politicians were especially active in increasing VAT tax rates after elections.

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Appendix A: Supplementary Tables

Table A-1 SUMMARY STATISTICS OF VARIABLES

Variable	Mean	Std. Dev.	Min.	Max.	Observations
Election	0.305	0.461	0	1	791
Aggregate Indicator (Tax Rate)	-0.01	0.329	-2	1.667	1166
Aggregate Indicator (Tax Base)	-0.068	0.334	-1.5	1.5	1166
CIT Indicator (Tax Rate)	-0.148	0.811	-2	2	1166
EXE Indicator (Tax Rate)	0.136	0.595	-2	2	1166
PIT Indicator (Tax Rate)	-0.142	0.851	-2	2	1166
PRO Indicator (Tax Rate)	0.002	0.275	-2	2	1166
SSC Indicator (Rate)	0.055	0.541	-2	2	1166
VAT Indicator (Tax Rate)	0.039	0.677	-2	2	1166
CIT Indicator (Tax Rate, non-normalized)	-0.22	1.18	-8	6	1166
EXE Indicator (Tax Rate, non-normalized)	0.174	0.808	-4	8	1166
PIT Indicator (Tax Rate, non-normalized)	-0.226	1.266	-9	4	1166
PRO Indicator (Tax Rate, non-normalized)	-0.003	0.337	-6	2	1166
SSC Indicator (Rate, non-normalized)	0.064	0.746	-6	6	1166
VAT Indicator (Tax Rate, non-normalized)	0.035	0.935	-10	6	1166

Notes: The table shows descriptive statistics of the variables used in our analysis. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

Table A-2 TAXES AND ELECTIONS—BASELINE-RESULTS, TAX BASES

Dependent variable: Tax Reform Index (aggregated, tax bases), $\mathfrak{S}_{it}^{A}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	-0.0083 (-0.30)			-0.0147 (-0.38)
Post-Election		0.0395 (1.22)		0.0297 (1.02)
Pre-Election			-0.0426 (-1.36)	-0.0457 (-1.02)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.0881	0.0914	0.0898	0.0923
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

Table A-3 TAXES AND ELECTIONS—ACCOUNTING FOR OBSERVABLE CONFOUNDING FACTORS, TAX RATES

Dependent variable: Tax Reform Index (aggregated, tax rates), $\mathfrak{S}_{it}^{A}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	-0.00488 (-0.15)			0.0462 (1.05)
Post-Election		0.0940*** (3.43)		0.114*** (3.27)
Pre-Election			-0.0165 (-0.40)	0.0138 (0.26)
ΔGDP^{pc}	-1.711 (-1.48)	-1.745 (-1.56)	-1.724 (-1.47)	-1.756 (-1.55)
Left-Wing Ideology	0.00596 (0.12)	0.00589 (0.12)	0.00625 (0.13)	0.00521 (0.11)
Globalization	-0.000385 (-0.05)	0.0000296 (0.00)	-0.000340 (-0.04)	0.000504 (0.06)
Political Institutions	-0.0545 (-0.54)	-0.0932 (-0.91)	-0.0544 (-0.56)	-0.115 (-1.19)
Observations	649	649	649	649
Countries	16	16	16	16
R-Squared (overall)	0.154	0.165	0.154	0.166
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

*** Significant at the 1 percent level

Table A-4 TAXES AND ELECTIONS—EXCLUDING US-MIDTERM ELECTIONS, TAX RATES

Dependent variable: Tax Reform Index (aggregated, tax rates), $\mathfrak{S}_{it}^{A}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	-0.00725 (-0.26)			0.0277 (0.76)
Post-Election		0.0758*** (3.58)		0.0882*** (3.04)
Pre-Election			-0.0111 (-0.31)	0.0161 (0.37)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.138	0.146	0.138	0.147
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

*** Significant at the 1 percent level

Table A-5 TAXES AND ELECTIONS—JACK-KNIFED ANALYSIS, TAX RATES

Dependent variable: Tax Reform Index (aggregated, tax rates), $\mathfrak{S}_{it}^{A}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Exclude Australia	0.0125 (0.57)	0.0737*** (3.18)	-0.0272 (-0.78)	0.0881** (2.91)
Exclude Austria	-0.0073 (-0.24)	0.0718*** (3.22)	-0.0090 (-0.24)	0.0844** (2.61)
Exclude Canada	-0.0085 (-0.28)	0.0755*** (3.21)	0.0184 (0.77)	0.101*** (3.33)
Exclude Denmark	-0.0119 (-0.40)	0.0859*** (4.36)	-0.0142 (-0.37)	0.0973*** (3.30)
Exclude Spain	-0.0099 (-0.33)	0.0793*** (3.65)	-0.0129 (-0.33)	0.0897** (2.93)
Exclude France	-0.0134 (-0.46)	0.0777*** (3.44)	-0.0101 (-0.26)	0.0879** (2.87)
Exclude United Kingdom	0.0046 (0.17)	0.0712*** (3.24)	-0.0064 (-0.16)	0.0916*** (3.04)
Exclude Germany	-0.0074 (-0.24)	0.0702*** (3.11)	-0.0176 (-0.47)	0.0776** (2.62)
Exclude Greece	-0.0110 (-0.36)	0.0617*** (3.35)	-0.0077 (-0.20)	0.0699** (2.66)
Exclude Ireland	-0.0056 (-0.19)	0.0707*** (3.19)	-0.0119 (-0.32)	0.0827** (2.74)
Exclude Italy	-0.0015 (-0.05)	0.0821*** (3.91)	-0.0238 (-0.63)	0.0943*** (3.05)
Exclude Japan	-0.0194 (-0.67)	0.0769*** (3.39)	-0.0131 (-0.33)	0.0814** (2.66)
Exclude Luxembourg	-0.0076 (-0.26)	0.0772*** (3.42)	-0.0174 (-0.46)	0.0872** (2.91)
Exclude Poland	-0.0094 (-0.33)	0.0773*** (3.44)	-0.0135 (-0.36)	0.0881** (2.87)
Exclude Portugal	-0.0172 (-0.60)	0.0791*** (3.52)	-0.0027 (-0.07)	0.0905*** (3.03)
Exclude United States	-0.0031 (-0.11)	0.0828*** (3.90)	-0.0087 (-0.22)	0.100*** (3.50)

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years. The estimated parameter reported in Column (IV) refers to the Post-Election dummy.

*** Significant at the 1 percent level,
** Significant at the 5 percent level

Table A-6 TAXES AND ELECTIONS—BASELINE-RESULTS, REDUCED VERSION OF OUR TAX REFORM INDICATOR, TAX RATES

Dependent variable: Tax Reform Index (aggregated, tax rates), $\mathfrak{S}_{it}^{A}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	0.00387 (0.14)			0.0353 (0.98)
Post-Election		0.0619** (2.83)		0.0761** (2.76)
Pre-Election			-0.0168 (-0.51)	0.00426 (0.10)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.137	0.143	0.137	0.144
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years. Results are obtained using the reduced version of our tax reform index that treats each reform equally, regardless of whether the IMF codes the reform as "major" or "minor".

*** Significant at the 1 percent level,
* Significant at the 10 percent level

Table A-7 TAXES AND ELECTIONS—BASELINE-RESULTS, ADVANCED AND EMERGING MARKET ECONOMIES, TAX RATES

Dependent variable: Tax Reform Index (aggregated, tax rates), $\mathfrak{S}_{it}^{A}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	0.00404 (0.17)			0.0709* (1.93)
Post-Election		0.0775*** (3.44)		0.114*** (3.59)
Pre-Election			0.0149 (0.50)	0.0601 (1.46)
Observations	836	836	836	836
Countries	22	22	22	22
R-Squared (overall)	0.0825	0.0923	0.0830	0.0992
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

*** Significant at the 1 percent level,
* Significant at the 10 percent level

Table A-8 TAXES AND ELECTIONS—DISENTANGLING EARLY AND REGULAR ELECTIONS, TAX RATES

Dependent variable: Tax Reform Index (aggregated, tax rates), $\mathfrak{S}_{it}^{A}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election (regular)	-0.0299 (-0.81)			0.00681 (0.13)
Post-Election (regular)		0.0797** (2.33)		0.0866** (2.05)
Pre-Election (regular)			-0.0296 (-0.78)	-0.00617 (-0.12)
Election (early)	0.0466 (1.22)			0.0718 (1.74)
Post-Election (early)		0.0604* (1.80)		0.0721** (2.29)
Pre-Election (early)			0.00624 (0.13)	0.0170 (0.35)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.143	0.145	0.140	0.152
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the results of our estimations on the relationship between tax reforms and election dates (Equation 4), disentangling early and regular elections. t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

** Significant at the 5 percent level,
* Significant at the 10 percent level

Table A-9 TAXES AND ELECTIONS—CORPORATE INCOME TAXATION, TAX RATES

Dependent variable: Tax Reform Index (corporate income taxation, tax rates), $\mathfrak{S}^r_{it}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	0.0624 (0.64)			0.150 (1.17)
Post-Election		0.103 (1.14)		0.167 (1.45)
Pre-Election			-0.0180 (-0.18)	0.0571 (0.57)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.124	0.125	0.123	0.127
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

Table A-10 TAXES AND ELECTIONS—PERSONAL INCOME TAXATION, TAX RATES

Dependent variable: Tax Reform Index (personal income taxation, tax rates), $\mathfrak{S}^r_{it}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	0.144 (0.85)			0.273 (1.21)
Post-Election		0.161 (1.32)		0.273** (2.24)
Pre-Election			-0.0777 (-0.51)	0.0562 (0.26)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.107	0.107	0.106	0.110
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

** Significant at the 5 percent level

Table A-11 TAXES AND ELECTIONS—EXCISES, TAX RATES

Dependent variable: Tax Reform Index (excises, tax rates), $\mathfrak{S}^r_{it}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	-0.0408 (-0.68)			-0.0445 (-0.65)
Post-Election		0.0675 (0.64)		0.0453 (0.41)
Pre-Election			-0.0410 (-0.90)	-0.0545 (-0.78)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.0864	0.0863	0.0863	0.0877
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

Table A-12 TAXES AND ELECTIONS—VALUE ADDED AND SALES TAXATION, TAX RATES

Dependent variable: Tax Reform Index (value added and sales taxation, tax rates), $\mathfrak{S}_{it}^{r}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	-0.0480 (-0.56)			0.0456 (0.41)
Post-Election		0.231*** (3.12)		0.248*** (3.36)
Pre-Election			-0.0494 (-0.72)	-0.00855 (-0.10)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.0792	0.0892	0.0793	0.0897
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

*** Significant at the 1 percent level

Table A-13 TAXES AND ELECTIONS—PROPERTY TAXATION, TAX RATES

Dependent variable: Tax Reform Index (property taxes, tax rates), $\mathfrak{S}^r_{it}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	0.00580 (0.33)			0.0248 (1.13)
Post-Election		0.0275 (0.72)		0.0381 (0.88)
Pre-Election			-0.00297 (-0.11)	0.0104 (0.36)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.0707	0.0722	0.0708	0.0723
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

Table A-14 TAXES AND ELECTIONS—SOCIAL SECURITY CONTRIBUTIONS, RATES

Dependent variable: Tax Reform Index (social security contributions, rates), $\mathfrak{S}^r_{it}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year election	-0.129** (-2.15)			-0.109* (-1.97)
Post-Election		0.0194 (0.28)		-0.0171 (-0.29)
Pre-Election			0.112 (1.59)	0.0670 (0.90)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.0761	0.0730	0.0772	0.0782
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4). t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

** Significant at the 5 percent level,
* Significant at the 10 percent level

Table A-15 TAXES AND ELECTIONS—ACCOUNTING FOR GOVERNMENT CHANGES, TAX RATES

Dependent variable: Tax Reform Index (aggregated, tax rates), $\mathfrak{S}_{it}^{A}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	0.000926 (0.03)			0.0441 (1.08)
Post-Election		0.0735*** (3.29)		0.0923*** (3.01)
Pre-Election			-0.0151 (-0.42)	0.0116 (0.25)
Government Change		-0.0205 (-0.70)	-0.0154 (-0.50)	-0.0231 (-0.74)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.128	0.136	0.129	0.137
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4) accounting for changes in government. The variable "Government Change" assumes a value of 1 if the incumbent has been replaced by another government, and zero otherwise. t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

*** Significant at the 1 percent level

Table A-16 TAXES AND ELECTIONS—ACCOUNTING FOR GOVERNMENT SPENDING, TAX RATES

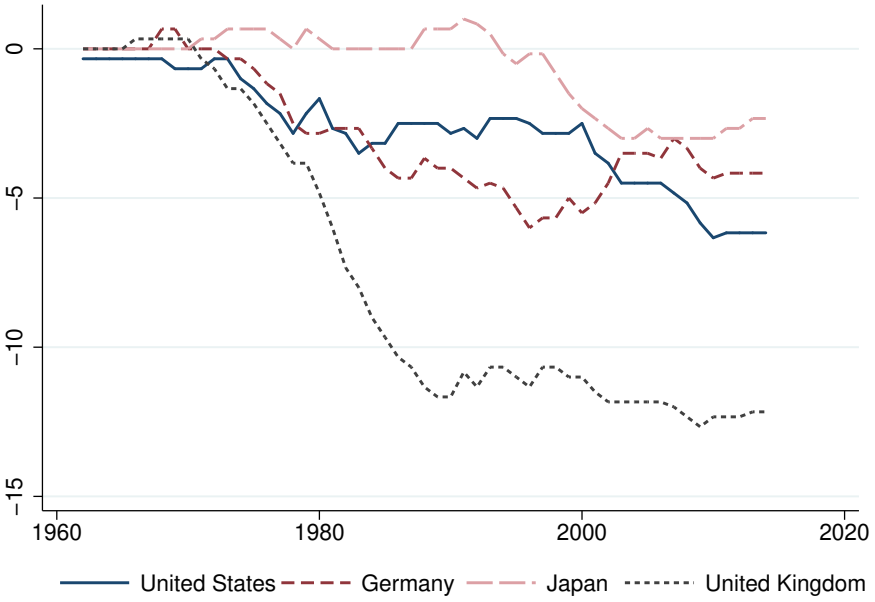
Dependent variable: Tax Reform Index (aggregated, tax rates), $\mathfrak{S}_{it}^{A}$				
	(I) Election year	(II) Post-Election	(III) Pre-Election	(IV) Full specification
Election year	0.000643 (0.02)			0.0386 (1.07)
Post-Election		0.0723*** (3.26)		0.0881*** (3.32)
Pre-Election			-0.0146 (-0.42)	0.00879 (0.20)
Government Spending (p.c.)	0.0001 (1.46)	0.0001 (1.46)	0.0001 (1.47)	0.0001 (1.45)
Observations	759	759	759	759
Countries	16	16	16	16
R-Squared (overall)	0.128	0.136	0.129	0.137
Prob. > F-Stat	0.000	0.000	0.000	0.000
Country-Level Fixed Effects	YES	YES	YES	YES
Period Fixed Effects	YES	YES	YES	YES

Notes: The table shows the baseline results of our estimations on the relationship between tax reforms and election dates (Equation 4) accounting for government spending per capita, taken from the IMF's International Financial Statistics. t values that are obtained using robust standard errors (adjusted for arbitrary heteroskedasticity) are reported in parentheses. The variable "Election" refers to election date in t, "Post-Election" shows the coefficient for election dates in $(t-1)$, "Pre-Election" reports coefficients for election dates in $(t+1)$. For a description of the Tax Reform Index, see Section (2). All estimations include fixed effects for countries and years.

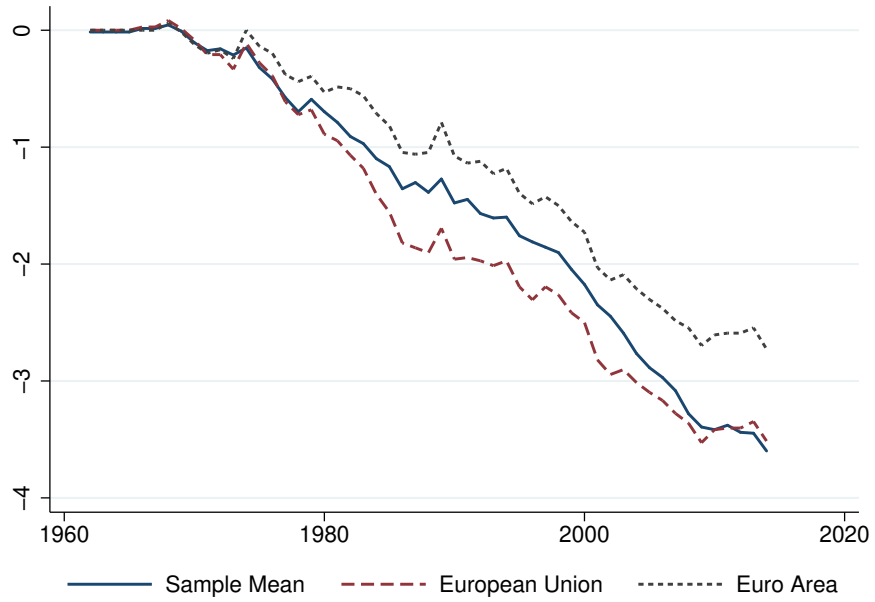
*** Significant at the 1 percent level

Appendix B: Supplementary Figures

Figure B-1 TRENDS IN TAX BASES, SELECTED COUNTRIES AND SAMPLES IN COMPARISON, 1960–2014.



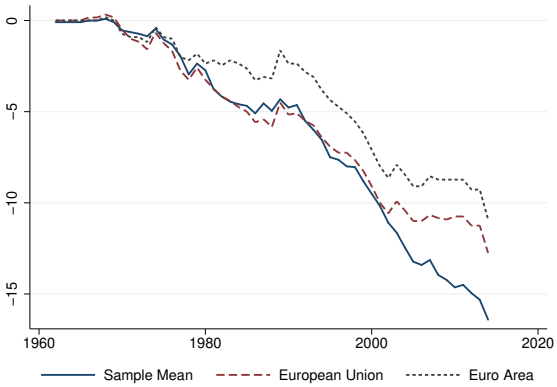
(a) Trends in taxation, the United States, Germany, Japan, and the United Kingdom.



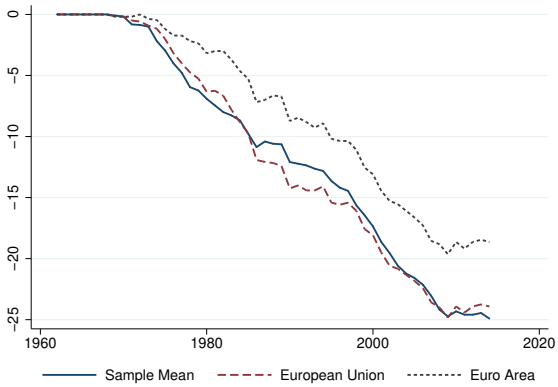
(b) Trends in taxation, sample mean, European Union and Euro Area.

Notes: The figure illustrates the accumulated version of the aggregate Tax Reform Index ($\mathfrak{S}^{A}_{iT'}$) for tax bases to compare trends in taxation between the United States, Germany, Japan, and the United Kingdom over time. For the accumulated version, each point in time T' represents the sum of the Tax Reform Index $\mathfrak{S}^{A}_{it}$ over all available periods prior to T'.

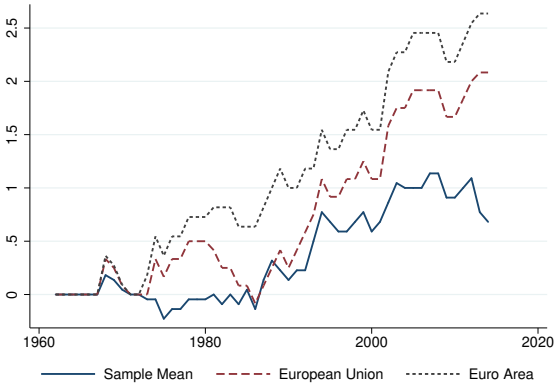
Figure B-2 TRENDS IN INDIVIDUAL TAX TYPES, TAX BASES, 1960–2014.



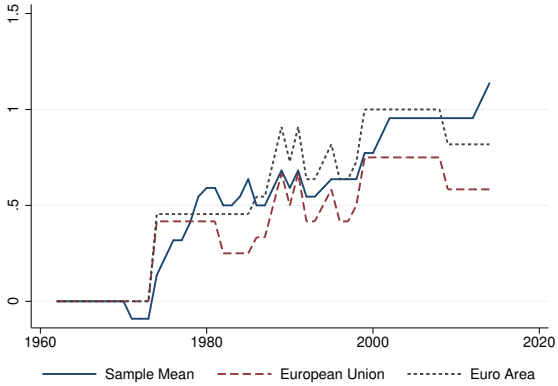
(a) Corporate tax bases.



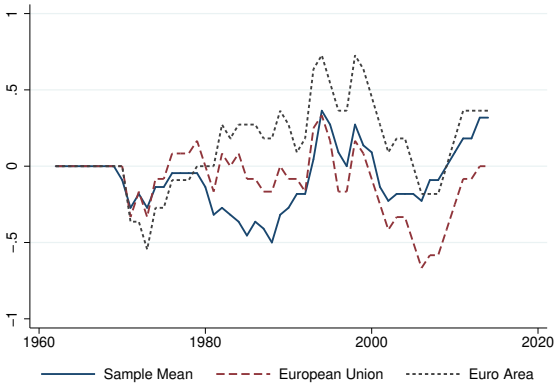
(b) Personal income tax bases.



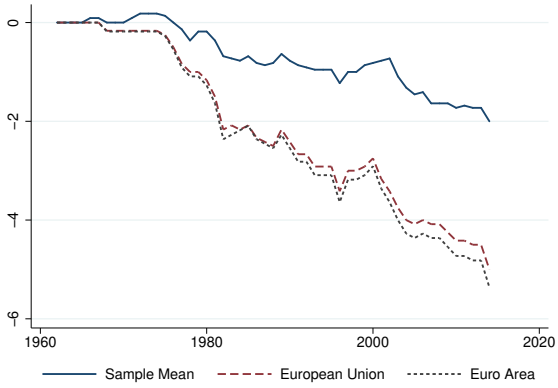
(c) Value added tax bases.



(d) Excise tax bases.



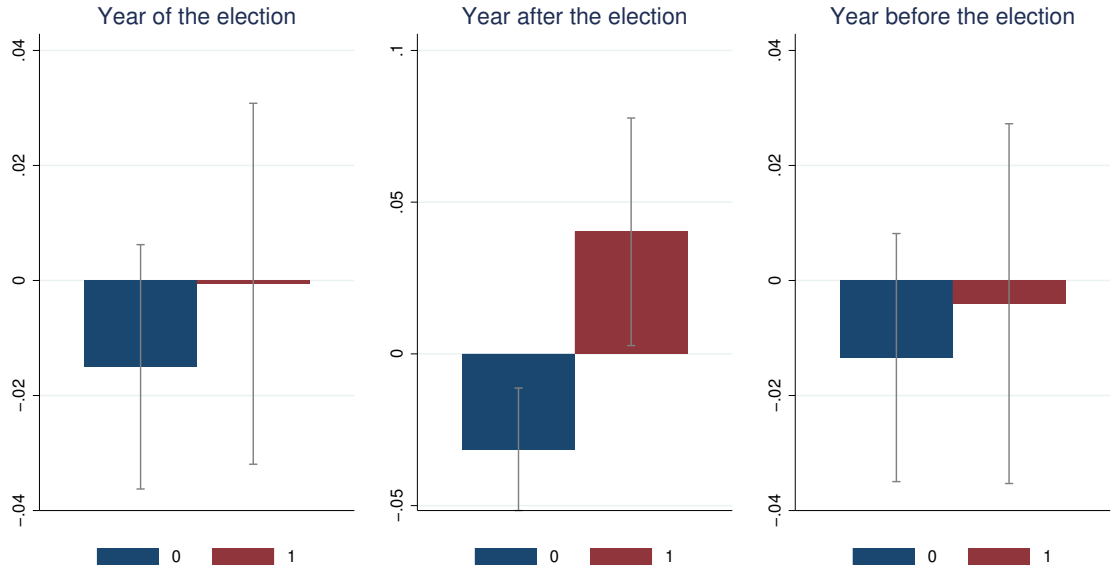
(e) Property tax bases.



(f) Social security contributions.

Notes: The figure illustrates the accumulated version of the Tax Reform Index ($\mathfrak{S}^{A}_{iT'}$) for tax bases for individual tax types to compare trends in taxation between the sample mean, the European Union, and the Euro Area over time. For the accumulated version, each point in time $T^{'}$ represents the sum of the Tax Reform Index $\mathfrak{S}^{A}_{it}$ over all available periods prior to $T^{'}$.

Figure B-3 CHANGES IN TAX RATES AND ELECTION DATES, AGGREGATE TAX REFORM INDEX, FULL SAMPLE OF ADVANCED AND EMERGING MARKET ECONOMIES, 1960–2014.



Notes: The figure shows changes in tax rates implied by the aggregate Tax Reform Index ($\mathfrak{S}^{A}_{iT'}$) in election years and non-election years. When comparing changes in tax rates in election years, label "1" refers to years with elections, while "0" refers to non-election years. When comparing changes in years before and after elections, "1" refers to the pre- or post-election-year. Vertical lines indicate 95% confidence intervals.

EconPol Europe

EconPol Europe - The European Network for Economic and Fiscal Policy Research is a unique collaboration of policy-oriented university and non-university research institutes that will contribute their scientific expertise to the discussion of the future design of the European Union. In spring 2017, the network was founded by the ifo Institute together with eight other renowned European research institutes as a new voice for research in Europe. A further five associate partners were added to the network in January 2019.

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2) reform of EU policies and the EU budget,

3) capital markets and the regulation of the financial sector and

4) governance and macroeconomic policy in the European Monetary Union.

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