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The Downsides of Democracy? - Tthe Case of Tax Complexity

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Abstract

This study investigates the association between the political characteristics of countries and the complexity of the legal system. We use country-level measures of tax complexity, democracy indicators, and election results data and find that the degree of democracy is associated with higher overall complexity of tax systems. This association is driven by the complexity of tax regulations. Contrastingly, we document negative associations with the complexity of tax procedures such as tax filings or tax audits. Moreover, we find the association between democracy and tax system complexity to be inversely U-shaped, indicating strong autocracies and strong democracies to reduce overall tax complexity. In further analyses, we document that the complexity of anti-tax avoidance regulations increases with higher levels of democracy and demonstrate that left-wing governed countries are more prone to experience an increase in complexity through democracy than right-wing governed countries.

Keywords: tax complexity, legislation process, political orientation
JEL Classification: K10, K34, H25

1   Introduction

This study examines the relationship between the degree of democracy and the complexity of a country's legal system. We use country-level measures of tax complexity and democracy to identify this association. In further analyses, we classify our sample countries as high, low, or moderate democratic countries and decompose a country's tax code into subcomponents to investigate nuanced drivers of the overall effect. Furthermore, we analyze the role of the level of international integration of economies and the governing party's political orientation in the relationship between democracy and complexity.

In recent years, the degree of democracy worldwide has been steadily declining.[1] At the same time, political polarization within countries has increased, as recent data from The Economist[2], Our World in Data[3], International IDEA,[4] and Tucker et al. (2018) shows. While we witness the resulting consequences of political changes, e.g., in terms of environmental policies (Klick (2002)) or media control (Rozenas and Stukal (2019)), so far, little is known about the consequences for the legal system. Since laws are the fundamental basis of societies, exploring potential changes in the complexity of (tax) regulations induced by political characteristics increases our understanding of factors influencing societal workings.

The complexity of the tax system offers a unique setting to study these changes. First, different from many other fields of law, tax regulations change frequently[5], making the link between political orientation and the complexity of current tax law easily identifiable. Second, the tax system affects a large part of society, making it likely that governments try to impact these regulations and influence their complexity. Third, the Tax Complexity Index by Hoppe et al. (2023) provides a profound measure of perceived tax complexity, inherent to our study. Previous studies of regulatory complexity focus on simple measures of complexity, such as the number of words, regulations, or paragraphs (Clotfelter (1983), Karlinsky (1981), Weinstein (2014), Weber (2015)). The multidimensional nature of the Tax

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[1] See https://www.economist.com/graphic-detail/2022/02/09/a-new-low-for-global-democracy.
[2] See. https://www.eiu.com/n/democracy-index-conflict-and-polarisation-drive-a-new-low-for-global-democracy/.
[3] See https://ourworldindata.org/less-democratic.
[4] See https://www.idea.int/.
[5] Labro and Pierk (2023) investigate accounting regulation changes in the European Union until 1993. They document that tax regulations have been the most frequent changing EU regulations and directives since 2010. This result is not only present for EU directives but even for single countries, e.g., in German national legislation, tax regulation changes are the most frequent changes in the observation period (http://www.eu-regulations.com/).

Complexity Index enables us to investigate the complexity of a whole corporate income tax system, specific income tax regulations (tax code complexity), and tax procedures such as tax audits (tax framework complexity).

Building on the Tax Complexity Index and the Democracy Index from The Economist,[6] we investigate the association between the degree of democracy and tax complexity using a country-level panel regression. In our analysis, we focus on the peculiarities of democratic and autocratic regimes and their implications for the complexity of a tax system. We argue that in democratic countries, an extensive legislative process leads to more complex regulations by incorporating multiple interests. This effect is particularly driven by many legislations being compromises of diverging interests for all groups participating in the political-economic process, leading to increased complexity of the law (OECD (2017)). Moreover, politicians in democracies face a tradeoff between attracting maximum votes by catering to many groups and the risk of high administrative costs and lengthy procedures due to the resulting complexity (Galli and Profeta (2009)). In autocracies, however, the association is less clear. Autocrats might simplify by making decisions based on self-interest and without a structured legislative process, which is likely to result in less complex tax regulations. On the contrary, the absence of a structured legislative process may lead to more complex tax regulations since the legislation is impaired by the pressure of the autocrat to maintain power (Dodlova and Lucas (2021)). Despite these opposing effects, we expect the complexity-reducing aspect of the absence of a structured legislative process to outweigh the potential disadvantages, leading to lower tax complexity for autocracies than democracies.

Consistent with this argumentation, we find that a one standard deviation increase in democracy is associated, on average, with a 3.3% more complex tax system. Compared to the average value of the Tax Complexity Index in our sample (0.373), this represents an increase of 1.1 percentage points. While the excessive legislative process leads to more complex tax regulations (4.9%), we find that the procedures in democracies are less complex (3.6%). However, the potential complexity-decreasing effect of democracy on tax procedures cannot outweigh the increase in the complexity of the tax code. Based on

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[6] See https://www.eiu.com/n/campaigns/democracy-index-2020/.

estimates from Fichtner and Feldman (2013)[7] for the U.S., these effect sizes translate into sizable costs for businesses of at least $7.1 billion and $32.6 billion of forgone tax revenue. Accordingly, our results indicate that tax complexity is a hidden byproduct of democratization, leading to substantial economic costs for both corporations and countries.

However, we find an inversely U-shaped relationship between democracy and tax complexity when we divide countries into terciles based on their level of democracy. Both edges, very democratic and very autocratic countries, are associated with less complexity, while moderate democracies increase complexity. These results align with the findings of Jones and Olken (2005), documenting that dramatic shifts to more democratization harm economic growth, and Garcia and Haldenwang (2016), finding a U-shaped relationship between the regime type of a country and its tax revenue. To establish causality for this finding, we build on an exogenous shock to democracy during the Arab Spring. Building on this natural experiment and employing a difference-in-differences analysis, we confirm this finding and document a decrease in complexity in treated countries relative to other Arab League countries. Results for matched treatment and control countries further support this result.

In additional tests, we investigate the drivers of increased complexity in democracies and heterogeneity regarding the political orientation of the ruling party. Using a factor analysis of the sub-components of the tax code complexity of the Tax Complexity Index, we hypothesize and find that the complexity of anti-tax avoidance regulations, i.e., those regulations designed to restrict tax avoidance by multinational corporations, increases in the level of democracy. Additionally, utilizing the Manifesto database[8], we study the association of right and left-wing characteristics of regimes and tax complexity. Left-wing parties favor redistribution more and do not trust market forces as much as liberal right-wing parties leading to higher taxes for corporations (Angelopoulos, Economides, and Kammas (2012), Wang (2021)). In addition, left-wing party supporters perceive possibilities for upward social mobility for individuals as less likely than right-wing party supporters (Alesina, Stantcheva, and Teso (2018)). Achieving redistribution of income from upper to lower classes requires extensive legislation to ensure the

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[7] Fichtner and Feldman (2013) estimate costs for corporations due to tax code complexity in the United States in 2012 of $ 215 to 987 billion. Moreover, they conclude that the revenue forgone to the US government is up to $ 452 billion.
[8] See https://manifesto-project.wzb.eu/information/documents/information.

effectiveness and accuracy of the desired outcome. Left-wing parties, therefore, are expected to create higher levels of tax complexity to enable paths for redistribution. In line with this expectation, we document that the positive association between democracy and the complexity of tax systems is persistent for left-wing governments. In contrast, we do not find similar associations for right-wing governments. We document no difference between the associations of left and right-wing governments and the complexity of tax procedures.

Overall, our results provide consistent evidence that democracies increase law complexity using the case of taxation. By doing so, we extend the literature on real effects of democracy. Besides contributing to the understanding of the effect of political characteristics on a country's legal environment, we also contribute to the literature on determinant factors of tax complexity. Tax complexity is continuously increasing, as recent survey evidence by Devereux (2016), Bornemann, Schipp, and Sureth-Sloane (2021), and Harst et al. (2021) indicates. In particular, internationally introduced regulations such as CFC rules have been identified as drivers of tax complexity (Devereux (2019), Siegel, Schanz, and Sureth-Sloane (2022)). In contrast, much less is known about further country-specific characteristics driving tax complexity. Hence, our results contribute to the understanding of the deterrence factors of legislation.

Our findings have important implications for policymakers and decision-makers in firms. We inform policymakers about the complexity resulting from compromises of diverging interests. Therefore, complexity is a by-product of democratization and can potentially be harmful for countries, e.g., in terms of discouraging foreign direct investment (Euler et al. (2024)) or the effectiveness of investment incentives (Amberger, Gallemore, and Wilde (2023)). More broadly, our results provide insights into the costs and risks of regulatory complexity, which are common features of many internationally negotiated regulations in the broader accounting domain. From a business perspective, we inform decision-makers about a potential cost of operating in democratic countries. While, in general, investments in democratic countries might be seen as less risky compared to investments in autocratic countries due to higher legal certainty (Zagler (2023)), we document widely overlooked costs associated with democracy-induced regulatory complexity, which is concentrated among medium-democratic countries.

2 Prior literature and hypothesis development

While studies of the determinants of tax complexity from a legislative perspective are scarce, numerous studies investigate the implications of tax complexity. Feldman, Katuščák, and Kawano (2016) state that tax complexity can cause confusion and lead to unintended behavioral responses by taxpayers, and Collier et al. (2018) find that it is a threat to economic prosperity. In addition to these macro-level implications, several studies examine the effects on firms. Kaplow (1998) and Krause (2000) find tax complexity increases taxpayers' compliance costs. Budak and James (2018) document an increase in tax planning and tax avoidance activities due to complexity, while Euler et al. (2024) find tax complexity, especially in tax procedures, harms foreign direct investment. Amberger, Gallemore, and Wilde (2023) study the effectiveness of investment incentives and find tax complexity to be harmful. Moreover, Giese, Koch, and Sureth-Sloane (2024) find that tax complexity poses costs to firms via increased numbers of tax department employees or tax risk. They show that companies tend to increase their tax department personnel in highly tax-complex countries. Despite this investment, tax code complexity-induced tax risk remains.

However, the determinants of tax complexity from a legislative perspective are understudied. Hoppe et al. (2018) study the perceptions of 221 tax consultants regarding the drivers of tax complexity and find, e.g., that the detailedness and frequent changes in tax regulations drive tax complexity. Moreover, Paul (1997) argues that tax complexity results from the "desire for equitable distribution of tax liabilities and the desire for certainty of application". Additionally, Slemrod (2005) uses the heterogeneity of the US state income tax system to investigate drivers of tax complexity and finds professional legislatures and non-active voting populations as the main drivers of US tax laws complexity. Analytically, Diller, Grottke, and Schneider (2013) investigate how tax complexity arises and argue that it is naturally tied to a complex world that needs to be regulated. In this setting, a cat-and-mouse game between tax authorities and taxpayers leads to more tax complexity. Therefore, they argue that tax complexity is an inherent feature of the tax system.

None of these studies focuses on the political factors behind the tax code and the tax framework that shape the complexity of a tax system. They especially ignore the effect of the institutional framework on the legal system- a facet we add to the literature with this study. This factor is of particular

importance, as the design of legal systems heavily relies on how societies, and therefore states, are organized. The design of states and governments and the resulting implications for the wealth of societies have been heavily discussed since the fundamental work of Schumpeter (1942) and Olson (1982). Political aspects are important factors in the organization and structure of societies as well as in economic, ecological, and foreign alignments. The structure of modern societies can be classified on a spectrum between democracy and autocracy. The forms of government in states are critically influence societal and political factors in the respective countries. Accordingly, prior literature documents different tax policy strategies across this spectrum. Galiani and Torrens (2014) and Tam (2004) demonstrate analytically that the governmental form affects the outcome of policy tools. Democracies, in contrast to autocracies, reflect a large number of individual interests in their legislation, resulting in higher bureaucracy costs as a rent for solving the agency problem between citizens and governments (Dixit (2010)). The aggregation of citizens' individual interests at the national level leads to representative types of tax systems. Through election votes, citizens' preferences map into governing parties and, hence, into legislation and tax systems.[9] Krieger (2022) shows analytically and empirically that democracy impacts the quality of economic institutions and, therefore, the taxation process.

While the literature on the relationship between political characteristics and the complexity of tax systems is scarce, the discussion about the relation between government forms and taxation is ongoing (see, e.g., Peters (1991), Gould and Baker (2002), and Kiser and Karceski (2017) for extensive literature overviews on taxation and politics). Garcia and Haldenwang (2016) find that countries with a higher level of democracy tax their taxpayers more because of economic growth, redistribution, and legitimacy. Surprisingly, they find a U-shaped relation between a country's tax revenue and its regime type. Accordingly, strong autocracies also tax more because of the higher extorting power of strong autocracies.[10] Boix (2003), Kenny and Winer (2006), and Winer, Profeta, and Hettich (2013) support

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[9] Fuest et al. (2024) find an association between election dates and tax rate increases. Especially increases in value added taxes and personal income taxes are postponed after election dates.

[10] These findings are confirmed in an analytical study by Hausken, Martin, and Plümper (2004). Also, Jones and Olken (2005) find small shifts from authoritarian to democratic regimes to increase economic growth but dramatic democratization to reduce economic growth. In contrast, Profeta, Puglisi, and Scabrosetti (2013) and Mulligan, Gil, and Sala-i-Martin (2004) do not find an association between the level of tax revenues and the degree of democracy.

this notion of democracies generating higher tax revenues.[11] The level of democracy in a country is crucial for both the level of tax revenue and the types of taxes collected. Democratic governments are more likely to implement flatter income tax rates (Mulligan, Gil, and Sala-i-Martin (2004)) and rely on higher levels of voluntary compliance because the possibilities for penalties are lower than in autocracies (Wintrobe (1990), Kenny and Winer (2006)).

On the other hand, autocrats design the tax system to secure their power and avoid being toppled by citizens. The trade-off for autocrats is to tax influential and rich elites, e.g., with taxes on land and property, or the broader working class, e.g., with income taxation.[12] Both could result in a loss of benevolence by at least one of these groups. Despotic autocrats who seized power illegally tend to focus on taxes on land and property to restrain the working class from a rebellion against the regime (Dodlova and Lucas (2021)). Moreover, autocratic countries tend to tax firms more than individuals (Musgrave (1969), Kenny and Winer (2006))[13] and are more likely to use direct rather than indirect taxes (Aidt and Jensen (2009), Profeta and Scabrosetti (2010), Profeta, Puglisi, and Scabrosetti (2013)).

Overall, these studies document the great influence of the governing form of states shaping the tax system and its complexity. To a certain extent, the country and its legislative body can define and influence these characteristics. Therefore, we investigate the impact of democracy on tax complexity. Democracies and autocracies, as the extremes of the spectrum of governmental forms, behave systematically differently in their (tax) legislative process. Strong autocracies can dictate the tax law without an extensive legislative process and the recognition of multiple interests (Tam (2004), Galiani and Torrens (2014)). In contrast, purely democratic countries tend to reflect as many single interests as possible in their (extensive) legislative process and therefore are more likely to implement more detailed and nuanced tax laws Krieger (2022). Galli and Profeta (2009) study the relationship between economic and political factors and tax complexity and find a tradeoff between the incorporation of multiple individual interests and excessive cost arising through a highly nuanced and therefore complex tax system. Hence, we expect the degree of democracy to be positively associated with the complexity of the tax system.

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[11] Acemoglu and Robinson (2006) and Meltzer and Richard (1981) state the same in analytical models.
[12] Dodlova and Lucas (2021) argue, that in autocracies the middle class is vanishing so there is no need to focus on the taxation of this group of society.
[13] Profeta and Scabrosetti (2010) do not support these findings.

H1: Tax systems are more complex in countries with a higher degree of democracy.

Besides the governing form of states, modern societies face international influences in their tax systems as markets and economies become increasingly integrated and globalized. The worldwide KOF Globalization Index increased by 66% between 1970 and 2021.[14] While globalization has undoubtedly brought many benefits to countries, economies, and societies, it has also opened avenues for global tax competition. Multinational corporations can decrease their tax burden through international profit shifting via treaty shopping or transfer pricing manipulation (Riedel (2018), Dharmapala (2020), Dyreng and Hanlon (2021)). Numerous national and international legislative initiatives, such as the BEPS project, have arisen to scrutinize tax avoidance and tie taxation to real economic activities. Accordingly, Labro and Pierk (2023) document a tremendous increase in EU accounting and tax regulations and directives since the early 2000s.[15]

To deal with arising challenges, supranational organizations, like the OECD, propose internationally accepted guidelines for supranational taxation matters, e.g., the OECD Transfer Pricing Guidelines (OECD (2022)). Although these supranational guidelines are not mandatorily binding for countries, many have implemented measures to counter declining tax revenues, resulting in a growing influence of international regulations on tax systems and, consequently, on their complexity. While this international influence is increasing, countries still have leeway to (1) partially deviate from supranational proposals and (2) to levy national-specific taxes. Hence, we expect the complexity of tax regulations to be driven by both national and international factors and predict that (recent) international aspects contribute to the complexity of the country's tax system.

H2: Global tax competition among democratic countries increase complexity.

The government form of countries sets the framework in which the tax system is shaped, and global aspects further affect the complexity of tax systems. However, there is still some leeway for governing parties. Therefore, we argue that the political agenda of governing parties shapes the tax system and its inherent complexity so that the tax system and the resulting tax revenues are tied to

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[14] See https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html.
[15] See http://www.eu-regulations.com/europe.html.

partisan politics.[16] Following prior literature, we argue that left- and right-wing governing parties use taxes differently. Shin (2017) finds that left-wing party governments increase statutory tax rates. However, firms' effective tax rates are not higher in these countries, leading to the conclusion that left-wing governments visibly increase the tax burden by increasing tax rates but decrease the tax burden via tax exemptions, resulting in a more complex tax system because of more regulations and loopholes. Moreover, left-wing parties favor redistribution and do not rely on market forces to reallocate income within society (Alesina, Stantcheva, and Teso (2018)). Therefore, left-wing governments incorporate higher tax rates for corporations to secure redistribution in the corporate sector (Angelopoulos, Economides, and Kammas (2012), Wang (2021)). Redistribution via taxation requires detailed and precise regulations to ensure the targeted taxation of specific groups within the society without constraining other groups. On the contrary, right-wing governing parties build on the idea of market forces and social mobility to higher income classes (Alesina, Stantcheva, and Teso (2018)) and, therefore, less detailed tax legislation. Hence, we predict that the association of Hypothesis 1 is more pronounced for left-wing countries.

H3: The association of democracy and tax complexity is more pronounced for left-wing governments.

3   Research Design

We test Hypothesis 1 and examine the association of a country's prior year level of democracy[17] with the current level of tax complexity using Equation (1). Formally, we estimate the following OLS-regression model.

$$TaxComplexity_{c,t} = \beta_0 + \beta_1 Democracy_{c,t-1} + \gamma\ Controls_{c,t} + \mu + \varepsilon_{c,t}\ (1)$$

$TaxComplexity_{c,t}$ is our dependent variable, capturing the degree of tax complexity in a given country c in time t. We use the Tax Complexity Index (*TaxComplexity*) by Hoppe et al. (2023) as well as its sub-indices Tax Code Complexity (*TaxCodeComplexity*) and Tax Framework Complexity

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[16] Potrafke (2017) documents a declining effect of partisan politics on economic outcomes since 1990, but still documents influence on privatization and market deregulation.

[17] Since enactment processes, especially in democracies, tend to be time-consuming procedures, we investigate the association between the democracy level of a country and the complexity of the tax system of the subsequent year.

(*TaxFrameworkComplexity*) to test Hypothesis 1. We primarily rely on the Tax Complexity Index as it is exclusively dedicated to corporate income tax complexity faced by MNCs, an area of highly publicly debated regulations and procedures in multiple tax systems worldwide. Additionally, we use data of the Paying Taxes database as a part of the Doing Business study by PwC and the World Bank to proxy for tax complexity as well.

$Democracy_{c,t-1}$ is our primary independent variable and measures the degree of democracy in country *c* in time *t-1*. We use the democracy index from the Economist Intelligence Unit (*Democracy_EIU*)[18] as the main measure of democracy. Compared to other democracy measures, it offers the best data coverage. However, we demonstrate the robustness of our findings using the democracy index from the Bertelsmann Transformation Index (*Democracy_BTI*)[19] and the Polity IV Project (*Democracy_PRC*)[20] as alternative proxies for democracy. We use all of these democracy measures in terms of their one-year-lagged values. This delay appears appropriate, as it takes some time for newly elected governments to set up the necessary procedures to be able to act. Karow (2018), e.g., documents an average duration of 206 days between the first discussion of a draft legislation in the German parliament and its enactment. While there may be some heterogeneity in the process of establishing a new government and passing a bill across countries, given this prior evidence, a one-year lag seems appropriate.

We extensively control for country characteristics using economic and societal factors (*Unemployment Rate*, *Population*, *GDP*, *GDPpercapita*, *Inflation*, *Corruption*).[21] Finally, we also use time fixed effects (μ) to account for time-specific shocks to tax complexity, such as the synchronic introduction of new regulations across countries. We provide detailed definitions for all variables in Table 1. Descriptive statistics for all variables included in Equation 1 are reported in Table 3. We conduct several additional analyses and robustness tests based on Equation 1. We test the complexity of single tax code regulations to detect the association between democracy and certain parts of the tax code in detail. Moreover, we use factor analysis and artificial intelligence to determine possible associations between democracy and certain clusters of regulations in the tax law. Additionally, we split the sample into right-

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[18] https://www.eiu.com/n/campaigns/democracy-index-2020/.
[19] https://bti-project.org/fileadmin/api/content/en/downloads/data/BTI_2006-2022_Scores.xlsx.
[20] See Marshall, Gurr, and Jaggers (2018).
[21] For our control variables, we rely on the complexity related country characteristics identified in Table 4 in Hoppe et al. (2023) and adapt them to the purposes of our study.

wing and left-wing governed countries to account for possible heterogeneous associations within the sample.

We test Hypothesis 1 by applying OLS regressions using Equation 1. This design estimates average effects over the entire sample population. However, Jones and Olken (2005) document dramatic shifts in democratization to harm economic growth and Garcia and Haldenwang (2016) are finding a U-shaped relationship between the regime type of a country and its tax revenue. Hence, we estimate separate regressions based on Equation (1) for democracy terciles. Additionally, we use Equation (2) to draw causal conclusions of the effect of extreme democratic shifts on the complexity of the tax system.

$$TaxComplexity_{c,t} = \beta_0 + \beta_1 ArabSpring_c + \beta_2 Post_t + \beta_3 ArabSpring_c * Post_t + \gamma\ Controls_{c,t} + \mu + \varepsilon_{c,t}\ (2)$$

In the model, we use the Arab Spring ($ArabSpring_c$) as the exogenous treatment. The Arab Spring has been a major exogenous shock to the degree of democracy in the affected countries (Abdel-Latif (2019)). During the Arab Spring numerous protests, riots, and revolutions took place in the Arab world with the urge to rise against authoritarian and autocratic regimes and to bring democracy and freedom to these Arabic countries (Acemoglu, Hassan, and Tahoun (2018)). The beginning of the Arab Spring was the revolution in Tunisia, starting on December 17th, 2010 (Rosiny and Richter (2016)). Riots of different forms in Bahrain, Egypt, Jordan, Kuwait, Libya, Morocco, Syria, Saudi Arabia, and Yemen followed. Therefore, we identify these countries as treated countries in the Arab Spring (*arab_spring*). Since riots in Bahrain, Saudi Arabia, and Syria led to no actual reforms, we exclude these countries from a second treatment group (*arab_spring_reform*). A third treatment group consists of the only two countries that actually changed government structures after the Arab Spring, leading to a clear tendency towards democracy, Egypt and Tunisia (*arab_spring_revolution*).[22]

[Insert Table 2 about here]

Noticeably, the treatment and control group trends in the pre-period are not parallel and thereby violate the parallel trends assumption in the difference-in-differences design (Figure 1). However, we build on recent developments in econometric literature (Bilinski and Hatfield (2018), Marcus and

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[22] All details regarding the Arab spring rely on information provided by the German Federal Agency for Civic Education (https://www.bpb.de/die-bpb/ueber-uns/federal-agency-for-civic-education/).

Sant'Anna (2021), Rambachan and Roth (2023)), relaxing the prerequisite of the parallel trends assumption and formulating ways to deal with non-parallel trends in the pre-period. Ryan et al. (2019) suggest that the combination of difference-in-differences estimators with matching is the least sensitive to deviations from the parallel trends assumption. Hence, we apply in additional analyses three different propensity score matchings (1:1 no replace, 1:3 replace, and 1:5 replace) using all control variables as matching variables.[23] Our results are robust to using these approaches.

In total, we investigate 120 country-year observations from the Arab League between 2008 and 2014. The timeframe from 2008 to 2010 is defined as the pre-period of the Arab Spring, and the period from 2012 until 2014 is defined as the post-period. We use the *TimeToComply* data instead of the *TaxComplexity* as the *TaxComplexity* data is unavailable for the sample period. We exclude the year of the riots (2011) and use the same set of control variables as described in Equation (1). We use Arab league countries as the control group for all three treatments.

[Insert Figure 1 about here]

4   Data & Measurement

To test our hypotheses, we conduct country-level analyses. The sample consists of all countries worldwide covered by our main databases: the Tax Complexity Index and the Democracy Index by the Economist Intelligence Unit. In total, we investigate 362 country-year observations of 95 unique countries from 2016 until 2020.

For each sample country, we use information on the country's tax complexity level using the Tax Complexity Index by Hoppe et al. (2023)[24] The Tax Complexity Index relies on the biannual MNC Tax Complexity Survey of tax experts advising multinational corporations in multiple countries worldwide. The results reflect the perceived tax complexity of tax experts in up to 100 countries. Tax complexity is defined as a feature of the tax system characterized by two sub-components. Tax code complexity describes the difficulty of reading, understanding, and complying with tax regulations characterized by five complexity drivers. The study identifies 15 internationally comparable tax regulations

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that serve as dimensions for the complexity of the tax code. Tax framework complexity describes the complexity that arises from the legislative and administrative processes and features within a tax system and is measured by five dimensions (Hoppe et al. (2023)). Since the underlying survey is conducted every two years, we impute missing values for 2017 and 2019 using the mean values of the adjacent years. We use both the Tax Complexity Index (*TaxComplexity*), the Tax Code Complexity (*TaxCodeComplexity*), and the Tax Framework Complexity (*TaxFrameworkComplexity*) subindices. Moreover, we split the Tax Code Complexity subindex into its 15 components to investigate the complexity of single regulations. As a second measure for tax complexity, we use the variable "Time (hours per year)" from the Paying Taxes database as a part of the Doing Business study by PWC and the World Bank (*TimeToComply*).[25] This variable measures the time in hours per year that is needed to comply with tax obligations for businesses in a given country in a certain year. It measures the time required to prepare, file, and pay three major types of taxes and contributions: the corporate income tax, value-added or sales tax, and labor taxes, including payroll taxes and social contributions. We use the time to comply with a tax system (*TimeToComply*) as a proxy for the complexity of a tax system since the complexity of a task crucially determines the time consumption of the task.[26]

We use the democracy index from the Economist Intelligence Unit (*Democracy_EIU*) as our main measure of a country's degree of democracy.[27] It captures the quality of democracy on a yearly basis using a scale between 0 and 100. The score is based on 60 aspects of democracy estimated by experts from different fields and multiple other sources, such as the World Values Survey.[28] Additionally, we apply two alternative democracy measures. First, we use the democracy score from the Bertelsmann Transformation Index (*Democracy_BTI*). The Bertelsmann Transformation Index publishes two rankings, the Status Index and the Governance Index, both based on in-depth assessments of 137 countries.[29] Second, we incorporate data from the Polity IV Project described by Marshall, Gurr, and Jaggers

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[25] See https://archive.doingbusiness.org/en/reports/thematic-reports/paying-taxes-2020.
[26] Hoppe et al. (2023) extensively discuss the measurement of tax complexity across countries and time.
[27] See https://www.eiu.com/n/campaigns/democracy-index-2020/.
[28] The Economist has created a visualization of the changing democracy index of all countries here: https://infographics.economist.com/2018/DemocracyIndex/.
[29] See https://bti-project.org/en/?&cb=00000.

(2018) (*Democracy_PRC*). This variable describes the political regime characteristics of countries on a 21-point scale ranging from -10 (hereditary monarchy) to +10 (consolidated democracy).

In further analyses, we rely on data from the Manifesto Project (Manifesto Research on Political Representation) to account for the political orientation (right-wing or left-wing) of governing parties. The Manifesto Project analyses parties' election manifestos to study their policy preferences. They use data analysts from over 50 countries to collect and analyze the comparative content of parties by analyzing their party manifestos. The provided Manifesto Project Dataset for examining the policy preferences covers over 1,000 parties from 1945 until today in over 50 countries on five continents.[30]

[Insert Table 3 about here]

To control for country-specific factors influencing the complexity of a tax system, we include several country-level control variables. We include country-level controls from the World Economic Outlook provided by the International Monetary Fund[31] to account for heterogeneities in countries' economic status (*GDP*, *GDPpercapita*, *Inflation*, *Population*, and *Unemployment Rate*). Moreover, we account for the level of corruption in a country (*Corruption*), using data from Transparency International.[32] In further analyses, we incorporate data from the KOF Globalization Index to capture the possible influence of globalization on the complexity of a country's tax system (Globalization).[33] See Table 1 for variable definitions and Table 3 for summary statistics.

To maintain a balanced panel for our analysis, we estimate values for missing data points from the different data sources. The final sample includes imputed values for the years 2017 and 2019 for *TaxComplexity* since the Tax Complexity Index relies on a biannual survey. PwC and World Bank discontinued the Paying Taxes study after the data for 2019 had been published. To keep our sample balanced, we impute the 2019 data for 2020. Moreover, missing data for the control variables *Unemployment Rate* (year average of all other observations) and *Inflation* (country averages) are imputed to balance the panel. However, our results remain robust to using only existing data points.

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[30] See https://manifesto-project.wzb.eu/information/documents/information.
[31] See https://www.imf.org/en/Publications/SPROLLS/world-economic-outlook-databases#sort=%40im-fdate%20descending.
[32] See https://www.transparency.org/en/cpi/2022.
[33] See https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html.

Pairwise correlations for all included variables are displayed in Table 4. We find significantly positive correlations between all control variables and the dependent variables *TaxComplexity*, *TaxCodeComplexity*, and *TimeToComply*. In contrast, *TaxFrameworkComplexity* is negatively correlated with *Democracy_EIU*, *Corruption*, and *GDPpercapita*. Higher tax framework complex countries tend to be less democratic (-0.529), have a lower level of corruption (-0.629), but are also less wealthy (-0.577). Therefore, the correlations between *TaxFrameworkComplexity* and *Corruption* and *GDPpercapita* seem to point toward complex tax frameworks mitigating corruption but at the same time lowering the welfare of citizens as well. The democracy proxies *Democracy_EIU* and *Democracy_BTI* show strong positive correlations with *Corruption* and *Globalization*, raising concern about multicollinearity. However, variance inflation factors are certainly below the threshold of ten and therefore mitigate these concerns.

[Insert Table 4 about here]

5   Results

5.1   Democracy and Complexity

We start our empirical analysis by investigating whether tax regulations are more complex in countries with a higher degree of democracy (Hypothesis 1). While democracies tend to have more nuanced tax regulations to serve as many societal interests as possible, autocrats depict the legal system as less complex and detailed (Hypothesis 1). The results in Table 5 strongly support this hypothesis. Using two different measures for tax complexity and three proxies for the degree of democracy, we find statistically significant coefficient estimates in five out of six specifications, supporting the notion that more democratic countries experience more complex tax regulations.[34]

[Insert Table 5 about here]

We assess the economic significance of our findings using our primary measure of democracy (*Democracy_EIU*) and the Tax Complexity Index (*TaxComplexity*) in column 1. Building on the coefficient estimate of column 1 (0.0065), a one standard deviation increase in democracy translates into a 1.1 percentage points higher tax complexity. This association corresponds to 3.3% of the sample average tax complexity. To put this into perspective, effects size translate into (compliance) costs for businesses

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[34] The results hold without any imputation (untabulated results). We also checked the results only with countries which appear over the whole sample period 2016 to 2020. The displayed results are robust as well.

of at least \$7.1 billion and \$32.6 billion of forgone tax revenue (Fichtner and Feldman (2013)). We find an even stronger positive association when using our second measure of tax complexity, the PwC and World Bank time to comply measure (*TimeToComply*). The statistically significant coefficient estimate (27.6239) corresponds to a 22.5% increase in *TimeToComply*. In absolute terms, this reflects a yearly increase in the time taxpayers spend on taxes by more than 50 hours.

Shedding light on the non-tax determinants of tax complexity, we find that wealthier countries (*GDPPPC*), countries with a lower degree of corruption (*Corruption*), and a lower inflation rate (*Inflation*) on average have a lower tax complexity. Contrastingly, larger countries (measured by GDP) and countries with a higher unemployment rate have a higher tax complexity. To check the robustness of these results, we also apply different democracy measures (*Democracy_BTI* and *Democracy_PRC*) and combine them with the two mentioned tax complexity proxies.[35] We find similar inferences in these specifications.

The dependent variables *TaxComplexity* and *TimeToComply* measure the overall complexity of a tax system. The comprehensiveness of the TaxComplexity allows us to investigate the associations of different aspects of the tax system further. Table 6 uses the sub-components Tax Framework Complexity (*TaxFrameworkComplexity*) and Tax Code Complexity Index (*TaxCodeComplexity*) to assess the associations with the tax regulations and the tax procedures. Tax framework complexity arises from the legislative and administrative processes and features within a tax system, such as tax filing procedures and tax audits. Tax code complexity is defined as the difficulty of reading, understanding, and complying with tax regulations (Hoppe et al. (2023)). Again, we apply all three measures of democracy in the specifications presented in Table 6 to ensure the robustness of our results.

[Insert Table 6 about here]

Columns 1 and 2 of Table 6 reveal that the positive association between democracy and tax complexity is driven by the complexity of tax regulations (*TaxCodeComplexity*). In contrast, the association between democracy and the complexity of the tax procedures (*TaxFrameworkComplexity*) is negative. While the excessive legislative process leads to more complex tax regulations (4.9%), the procedures in democracies are less complex (3.6%). A possible explanation being that the tendency of

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[35] The sample sizes vary due to different data coverages of the used variables.

democracies to apply more complex regulations (to capture multiple stakeholder interests) allows them to have a more straightforward tax framework to support the well-articulated and detailed tax regulations. Moreover, democracies with extensive institutional bodies tend to be more reliable and less arbitrary in applying laws (Tapscott (2021)). These opposing associations are also persistent for the democracy proxies *Democracy_PRC* (columns 5 and 6) and *Democracy_BTI* (columns 3 and 4). The association with *TaxCodeComplexity* is present for both proxies, while the association with *TaxFrameworkComplexity* appears insignificant at conventional levels in the *Democracy_BTI* specification. One possible explanation for this result is the sample composition of the Bertelsmann Transformation Index. Unfortunately, central European and northern American countries are not captured in this study. Mostly, these countries are highly developed countries with strong institutions and therefore less complex tax procedures.

The aforementioned analyses focus on average associations. However, prior literature (Jones and Olken (2005), Garcia and Haldenwang (2016)) documents that edges in the political spectrum, such as extreme democracies or autocracies, exhibit different outcomes compared to moderate positions. For example, Garcia and Haldenwang (2016) demonstrate that the relationship between a country's tax revenue and its regime type is U-shaped. Extreme autocracies and democracies tend to tax more than moderate governments. Following this intuition, we investigate a possible non-linear relationship between the degree of democracy and tax complexity. Figure 2 presents graphical evidence for this non-linear relationship between complexity (*TaxComplexity*) and democracy (*Democracy_EIU*).

[Insert Figure 2 about here]

We display *TaxComplexity* on the y-axis (scale 0 to 1) and *Democracy_EIU* on the x-axis (scale 0 to 10). The 362 observations are displayed in hollow black dots. The solid black line reflects a fitted reversed U-shaped line. The dashed grey line illustrates the predicted shape of the relationship. The predicted line nearly captures the curve of the fitted line, indicating a U-shaped connection between tax complexity and democracy.

We further explore this relationship using regression analyses presented in Table 7. To test the intuition that the edges of democracy, i.e., extreme autocracies and extreme democracies, behave significantly differently, we split *Democracy_EIU* into three terciles: high democracy (columns 1 and 2),

low democracy (columns 3 and 4), and moderate democracy (columns 5 and 6). We again use *TaxComplexity* (columns 1, 3, and 5) and *TimeToComply* (columns 2, 4, and 6) as dependent variables.

[Insert Table 7 about here]

In the high democracy specifications (columns 1 and 2), we find negative coefficient estimates for the variable *High Democracy* for both specifications. In the *TaxComplexity* (*TimeToComply*) specification in column 1 (2), we document a 6 % (2.5%) decrease in tax complexity. Noticeably, the coefficient in the *TaxComplexity* specification is marginally statistically insignificant on conventional levels. Accordingly, we find highly significant negative results in the low democracy, i.e., high autocracy, specifications (-3,8% in *TaxComplexity*, -17.34% in *TimeToComply*) (columns 3 and 4). Correspondingly, the moderate democracy specifications show highly significant positive coefficient estimates in both specifications and indicate a 3.7% higher *TaxComplexity* and more than 40 compliance hours more per year. Therefore, the main result of democracy and tax complexity being positively related, displayed in Table 5, seems to be driven by moderately democratic countries. Taken together, these findings confirm the notion that the relationship between democracy and complexity is, in fact, inversely U-shaped with the overall association is therefore driven by moderately democratic countries.

Since these results only represent correlations and do not allow us to draw causal inferences, we proceed by examining one of the largest shifts in democracy in human history, the Arab Spring. This event serves as a quasi-natural experiment for the countries affected.

5.2 Arab Spring

We investigate the effects of the exogenous democracy shift within the Arab Spring in a difference-in-differences design.

[Insert Table 8 about here]

Table 8 displays the results of the difference-in-differences analysis using the Arab Spring as an exogenous shock to the level of democracy of the affected countries. The difference-in-differences estimates for *treated_post*, reflect the effect on the complexity in the tax systems of the different treatment groups *arab_spring*, *arab_spring_reform*, and *arab_spring_revolution*. The composition of the different treatment groups is displayed in Table 2. As expected, we find no statistically significant effects

for the *arab_spring* and *arab_spring_reform* groups (columns 1 and 2). However, in line with the findings from Table 7, we find a statistically significant negative coefficient estimate in the *arab_spring_revolution* specification, displayed in column 3. Columns 4 to 6 report the results for our matched samples. We find similar inferences in two out of the three PSM models, with the third being close to statistical significance on conventional levels. This effect is also significant in economic terms. The coefficient estimate of 19.966 (column 3) corresponds to a reduction in *TimeToComply* of 17.73%. In turn, this reflects a decrease of 41.17 hours in the yearly time to comply with the tax obligations. The effects of the difference-in-differences analyses confirm that strong shifts in the level of democracy lead to a decrease in tax complexity and therefore confirm the prior finding that extreme democracies actually decrease complexity.

5.3   Global Tax Competition and Complexity

The results for Hypothesis 1 document, on average, a positive relationship between the degree of democracy and tax complexity. In the following, we want to explore the dynamics behind this association more closely by investigating potential drivers. We start by focusing on facets of the tax code. Using the Tax Complexity Index allows us to further differentiate between the complexity of 15 single tax regulations. Table 9 shows the results of a single regulation complexity regression analysis. Almost all tested regulations (*Additional Taxes*, *Alternative Minimum Taxation*, *Capital Gains/Losses*, *CFC Rules*, *Corporate Reorganization*, *Dividends*, *General Anti Avoidance* (Panel A)), and *Group Treatment*, *Investment Incentives*, *Statutory Tax Rate*, *Transfer Pricing* (Panel B)) show a positive association with *Democracy_EIU*. In contrast, the coefficient estimates for the regulations *Depreciation*, *Interest*, *Loss Offset*, and *Royalties* are not statistically significant on conventional levels.

[Insert Table 9 about here]

However, the tax complexity values of the different regulations are highly correlated. Hence, we apply a factor analysis to reduce dimensions and identify the underlying mechanisms of the association. Using the Kaiser criterion, we identify two factors with eigenvalues greater than one (Kaiser (1960)) within the regulations (Table 10). The identified factors are:

-   Factor 1: *Dividends, Royalties, Depreciation & Amortization, Interest, Loss Offset, Statutory Tax Rate, Capital Gains*

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- Factor 2: *CFC Rules, Corporate Reorganization, General Anti Avoidance, Transfer Pricing, Group Treatment*

Using this classification results in assigning the regulations alternative minimum taxation, additional taxes, and investment incentives to neither of the two factors.

[Insert Table 10 about here]

We employ artificial intelligence (ChatGPT 4.0) to describe the detected factors. We asked ChatGPT 4.0 "What have these tax regulations in common?" and listed the respective regulations of each factor separately. This procedure yielded the following answers:

- Factor 1: "[…] In summary, all these elements affect the computation of taxable income and ultimately influence the amount of tax an entity or individual is required to pay."

- Factor 2: "[…] In summary, these regulations are aimed at ensuring tax compliance, preventing tax avoidance and evasion, and addressing issues related to international taxation and complex corporate structures. They help maintain the integrity of the tax system by ensuring that entities cannot exploit gaps or mismatches in tax laws to unduly minimize their tax liabilities."

Following this argumentation, we name Factor 1 *ComputationPayment* and Factor 2 *AntiTaxAvoidance*. In the following, we run OLS regressions similar to Equation (1) using these factors as dependent variables.

[Insert Table 11 about here]

Table 11 displays the results of the OLS regressions on the two factors. The association between democracy and *ComputationPayment* is statistically insignificant at conventional levels. However, we find a significant positive association for *AntiTaxAvoidance* in column 2, indicating increased complexity in internationally driven regulations in more democratic countries. In economic terms, a one standard deviation increase in democracy is associated with a 2.6% higher complexity of *AntiTaxAvoidance* regulations. A possible explanation for this finding is, that the global tax competition and the tendency of multinational companies to use the international tax differential to shift profits and decrease tax rates (Hanlon and Heitzman (2010)), requires highly complex regulations to secure tax revenues in countries.

More democratic countries are likely to be more globalized in their economic structures and hence, are more exposed to international profit shifting, resulting in the need for greater restricting tax avoidance. Therefore, we include *Globalization* as a control variable in the subsequent analyses in Table

11. As expected, *Globalization* is not associated with *ComputationPayment* (column 3) but is significantly associated with *AntiTaxAvoidance* (column 4). The coefficient estimate for *Democracy_EIU* only changes marginally, but the quality of the model (adj. R²) increases by 114% in column 4. Given this finding, we repeat the analysis conducted in Equation (1) and include *Globalization* as an additional control variable in columns 5 to 7 to check the robustness of our main results (Table 3). The baseline association of globalization and tax complexity is positive (column 5). Nevertheless, our main results are robust to the inclusion of *Globalization* and remain constant. However, given the high correlation (0.7157) between *Democracy_EIU* and *Globalization* we abstain from including *Globalization* in our main analyses. Overall, the presented results in this section confirm Hypothesis 1.

5.4 Left-wing Governments in Democracies and Complexity

Left-wing parties favor redistribution more and do not rely on market forces to reallocate income across society (Alesina, Stantcheva, and Teso (2018)). Redistribution via taxation requires detailed and precise regulations to ensure the targeted taxation of all groups within the society without constraining others. On the contrary, right-wing parties trust market forces and the possibility of social mobility to higher income classes (Alesina, Stantcheva, and Teso (2018)), resulting in simpler and less detailed tax legislation. Hence, we predict that the association of Hypothesis 1 is more pronounced for left-wing countries (Hypothesis 3). The corresponding results are displayed in Table 12.

[Insert Table 12 about here]

Panel A of Table 12 shows sample split results regarding the political direction of the governing party (right-wing or left-wing), using data from MARPOR. We split the sample into left-wing governed and right-wing governed countries. Using available information for 204 of our sample countries, we split the sample into 125 left-wing and 79 right-wing countries. To do so, we split the MARPOR index at 0 (range -100 to 100). In Panel B, we split the sample further into quartiles by performing a median split within the left-wing and right-wing groups to investigate the association of democracy and tax complexity in political extremes in the respective left/right spectrum. The median splits are performed on a yearly basis. The respective groups contain 61 strong left-wing and 41 strong right-wing countries. Columns 1 and 2 of Panel A display the association between *TaxComplexity* (tax system complexity) and *Democracy_EIU* for the right-wing (column 1) and left-wing (column 2) subsamples, respectively.

We expect and find a significantly greater association in the left-wing subsample, indicating that the association is more pronounced in left-wing governed countries. Re-estimating the model for the complexity of tax regulations (columns 3 and 4) yields similar results. However, when performing an F-test, we find no statistically significant difference on conventional levels between the left- and right-wing estimates. Also, we find no statistically significant results for the tax framework (columns 5 and 6).

Lastly, we analyze the edges of the left-wing and right-wing groups more closely to investigate whether an inversely U-shaped relationship exists (similar to Figure 2). Panel B of Table 12 shows the corresponding results. In the extreme left-wing sample, we again find a U-shaped association. The coefficient estimates for democracy in the *TaxComplexity* and *TaxCodeComplexity* specification become negative (*TaxCodeComplexity* estimate being slightly insignificant), and the negative coefficient estimate in the *TaxFrameworkComplexity* specification is prevalent. In the right-wing subsample, we observe similar results for *TaxCodeComplexity* and *TaxFrameworkComplexity* specifications, and *TaxComplexity* remains insignificant. Overall, the edges of the left- and right-wing also show a U-shaped association in these specifications. All associations are more pronounced in left-wing governed countries (H3).

6   Conclusion

This study investigates the association between political characteristics, such as the degree of democracy, globalization, and the political orientation of governing parties, and the complexity of tax systems. Since political factors shape the form and extensiveness of tax systems, we exploit data from the Tax Complexity Index, the democracy index from the Economist Intelligence Unit, and the political direction by governing parties using data from the Manifesto Project Dataset in our main analyses. In a sample of 95 countries worldwide and over a time period of five years (2016-2020), we investigate the influence of the degree of democracy and the political direction of governing parties on the complexity of the overall tax system, the tax code, the tax framework and anti-tax avoidance and computational factors of tax regulations, identified using factor analysis and artificial intelligence. Moreover, we use the Arab Spring as a quasi-natural experimental setting to test the robustness of our results.

We hypothesize and find a positive association between a higher degree of democracy and tax complexity. In economic terms, we find that a one standard deviation increase in democracy is associated with 3.3% more complexity in the tax system. While the excessive legislative process leads to more complex tax regulations (4.9%), the procedures in democracies are less complex (3.6%). Moreover, we find an inversely U-shaped relationship between democracy and complexity. Extreme democracies and autocracies are associated with less complex tax systems, while moderate democracies drive our overall association. Using the Arab Spring as an exogenous shock to the level of democracy in the affected countries, we confirm this finding. In subsequent analyses, we find that the complexity of globally driven tax regulations is particularly affected by democratic countries and that left-wing democracy further increases tax complexity.

Besides contributing to the understanding of the association of political characteristics and a country's legal environment, we also contribute to the literature on determinant factors of tax complexity. Tax complexity is continuously increasing, as recent survey evidence by Bornemann, Schipp, and Sureth-Sloane (2021), Devereux (2016), and Harst et al. (2021) indicate. In particular, internationally introduced regulations such as CFC rules have been identified as drivers of tax complexity (Devereux (2019), Siegel, Schanz, and Sureth-Sloane (2022)). In contrast, much less is known about country-specific characteristics driving tax complexity. Hence, our results contribute to the understanding of the deterrence factors of legislation. The results of our study imply potential downfalls of democratization because this might lead to extensively complex tax systems and therefore further increase bureaucracy and compliance costs. Noticeably, the association between democracy and complexity is inversely U-shaped, indicating political extremes decrease complexity. Therefore, extreme democracies and extreme autocracies are able to mitigate complexity. Additionally, we provide evidence of democracy increasing the complexity of anti-tax avoidance regulations, indicating hidden costs of democratization in the form of overly complex regulations to defend national tax revenues.

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Figure 1: Complexity Trends around the Arab Spring
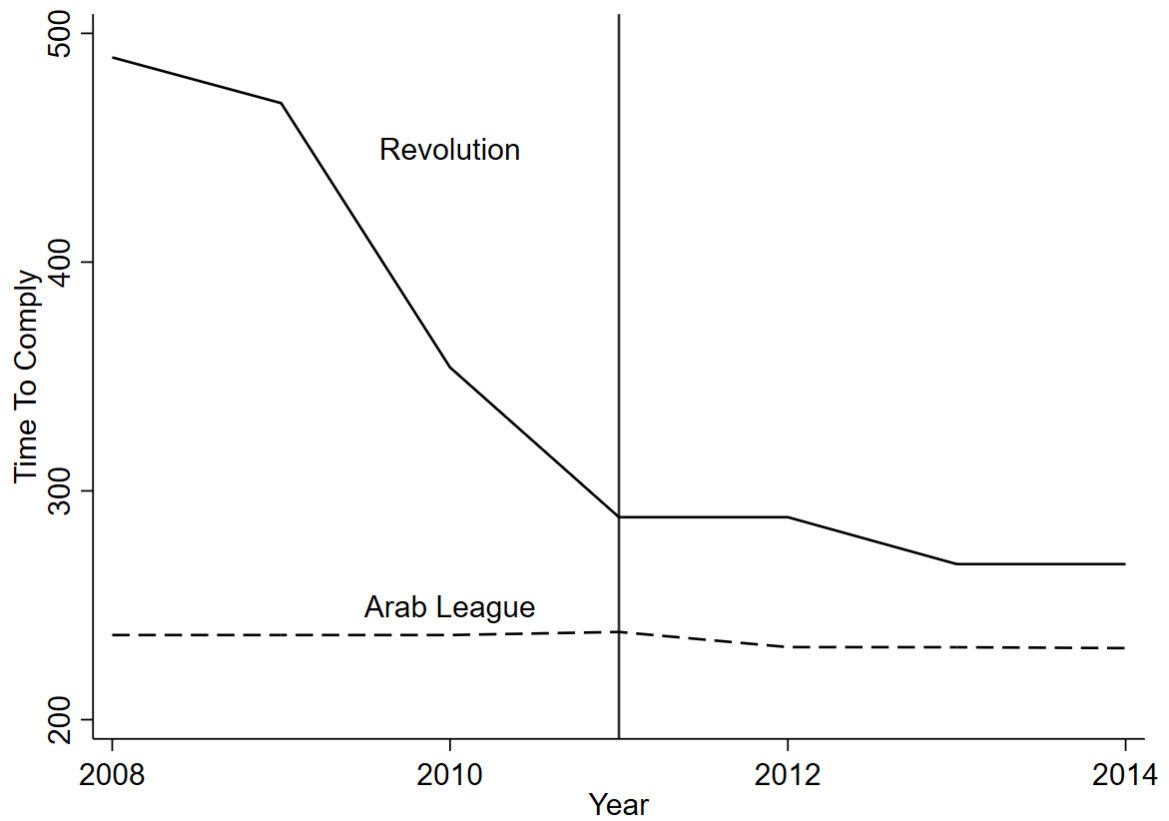
Notes: This figure presents the complexity trends before and after the exogenous shock of the Arab Spring 2011. Complexity is measured by the variables *TimeToComply* (Time to Comply). The solid line reflects the *TimeToComply* values for the treatment group (*arab_spring_revolution*), whereas the dashed line reflects the *TimeToComply* values of the control group (*arab_league*). *TimeToComply* is measured in hours. See Table 2 for information about the sample construction.

Figure 2: Complexity and Democracy
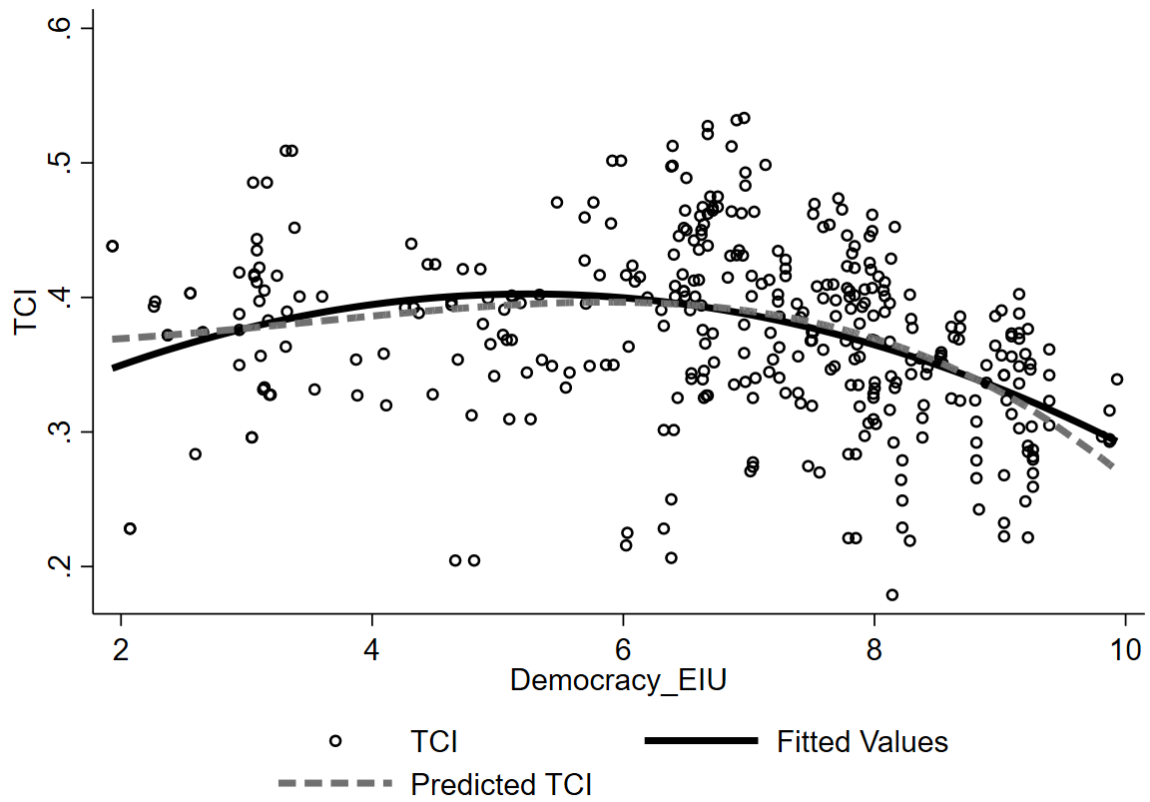
Notes: This figure presents the distribution of the 362 observations of Democracy (*Democracy_EIU*) of the sample by the respective Tax Complexity Index values. The hollow circles reflect the actual observation values. The solid black line represents a fitted reversed U-shaped line. The dashed grey line reflects the predicted shape of the relationship. *Democracy_EIU* ranges between 0 and 10, *TaxComplexity* between 0 and 1.

Table 1: Variable definitions

Variables	Definition	Data Source
	TAX COMPLEXITY	
TaxComplexity	Overall tax complexity score as defined by Hoppe et al. (2023).	taxcomplexity.org
TaxCodeComplexity	Tax code complexity score as defined by Hoppe et al. (2023).	taxcomplexity.org
TaxFrameworkComplexity	Tax framework complexity score as defined by Hoppe et al. (2023).	taxcomplexity.org
TimeToComply	The time to comply with tax laws measures the time taken to prepare, file, and pay three major types of taxes and contributions: the corporate income tax, value added or sales tax, and labor taxes, including payroll taxes and social contributions.	PWC and World Bank Paying Taxes
	DEMOCRACY	
Democracy_EIU	This democracy index uses the data from the Economist Intelligence Unit to express the quality of democracies as a score between 0 and 100. It is based on 60 different aspects of societies that are relevant to democracy, comprising universal suffrage for all adults, voter participation, perception of human rights protection, and freedom to form organizations and parties. The democracy index is calculated from the 60 indicators, divided into five "sub-indexes", which are: Electoral pluralism index, Government index, Political participation index, Political culture index, Civil liberty index.	Economist Intelligence Unit
Democracy_BTI	The Bertelsmann Transformation Index publishes two rankings, the Status Index and the Governance Index, both of which are based on in-depth assessments of 137 countries. The Status Index ranks the countries according to the state of their democracy and market economy, while the Governance Index ranks them according to their respective leadership's performance. The indices consist of a total of 17 criteria, subdivided into 49 questions.	Bertelsmann Transformation Index
Democracy_PRC	*Democracy_PRC* is measured using the "Polity Score". The score captures the regime's authority on a 21-point scale ranging from -10 (hereditary monarchy) to +10 (consolidated democracy).	systemicpeace.org

Table 1: Continued

Variables	Definition	Data Source
	CONTROL VARIABLES	
Corruption	Level of corruption of the respective country in year t.	Transparency International
GDP	Gross domestic product of the respective country in year t.	International Monetary Fund
GDPpercapita	Gross domestic product per capita of the respective country in year t.	International Monetary Fund
Globalization	Level of globalization of the respective country in year t.	KOF Globalization Index
Inflation	Inflation rate of the respective country in year t.	International Monetary Fund
Population	Number of citizens of the respective country in year t.	International Monetary Fund
Right_Left	The respective country's political direction score (right/left) in year t.	Manifesto Project
Unemployment Rate	Unemployment rate of the respective country in year t.	International Monetary Fund

Notes: This table presents an overview of all dependent and independent variables used in the analyses including variable definitions and data sources.

Table 2: Sample Selection Arab Spring

	arab_league	arab_spring	arab_spring_ reform	arab_spring_ revolution
Algeria	X			
Bahrain	X	X		
Comoros	X			
Djibouti	X			
Egypt	X	X	X	X
Iraq	X			
Jordan	X	X	X	
Kuwait	X	X	X	
Lebanon	X			
Libya	X	X	X	
Mauritania	X			
Morocco	X	X	X	
Oman	X			
Qatar	X			
Saudi Arabia	X	X		
Palestine*				
Somalia*				
Sudan	X			
Syria	X	X		
Tunisia	X	X	X	X
United Arab Emirates	X			
Yemen	X	X	X	
∑ of countries	20	10	7	2

Notes: This table presents an overview of the different (treatment) groups in our Arab Spring analyses. Palestine and Somalia are excluded due to data constraints. During the Arab Spring there have been riots of different forms in Bahrain, Egypt, Jordan, Kuwait, Libya, Morocco, Syria, Saudi Arabia, and Yemen. Therefore, we identify these countries as treated countries (*arab_spring*). Since riots in Bahrain, Saudi Arabia, and Syria led to no actual reforms, we exclude these countries from a second treatment group (*arab_spring_reform*). A third treatment group consists of the only two countries that actually changed government structures after the Arab Spring, leading to a clear tendency towards democracy, Egypt and Tunisia (*arab_spring_revolution*). All information relies on the German Federal Agency for Civic Education.

Table 3: Summary Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) p5	(5) p95	(6) min	(7) max
COMPLEXITY MEASURES							
TaxComplexity	362	0.373	0.0670	0.249	0.475	0.179	0.534
TaxCodeComplexity	362	0.448	0.0919	0.297	0.577	0.119	0.642
TaxFrameworkComplexity	362	0.298	0.0755	0.184	0.425	0.141	0.542
TimeToComply	357	232.2	243.1	64	453	41	2,600
DEMOCRACY MEASURES							
Democracy_EIU	362	6.764	1.911	3.040	9.220	1.930	9.930
Democracy_BTI	241	6.476	2.034	3.250	9.400	2.308	9.950
Democracy_PRC	121	5.521	5.930	-7	10	-10	10
CONTROLS							
Corruption	362	5.260	1.967	2.700	8.500	1.400	9
GDP	362	1.062	2.868	0.0136	3.690	0.0105	21.37
GDPpercapita	362	2.335	2.373	0.156	6.727	0.0476	11.85
Unemployment Rate	362	7.672	4.819	2.541	17.80	1	29.18
Population	362	8.049	22.77	0.127	26.14	0.0450	141.2
Globalization	362	7.390	1.162	5.239	8.950	3.736	9.114
Inflation	362	5.361	26.98	-0.451	12.84	-1.558	438.1
Right_Left	208	-3.852	22.58	-37.81	35.21	-52.49	91.89

Notes: This table presents summary statistics of all variables. The table includes the number of observations (n), the mean value (mean), the standard deviation (sd), the 5 % and 95% percentiles (p5, p95), and the minimum and maximum values.

Table 4: Pairwise Correlations

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	TaxComplexity	1.000														
(2)	TaxCodeComplexity	0.840*	1.000													
(3)	TaxFramework Complexity	0.751*	0.272*	1.000												
(4)	TimeToComply	0.334*	0.158*	0.400*	1.000											
(5)	Democracy_EIU	-0.222*	0.111*	-0.529*	-0.169*	1.000										
(6)	Democracy_BTI	-0.014	0.127*	-0.204*	0.037	0.898*	1.000									
(7)	Democracy_PRC	0.034	0.247*	-0.305*	0.024	0.821*	0.779*	1.000								
(8)	Corruption	-0.388*	-0.049	-0.629*	-0.336*	0.775*	0.587*	0.383*	1.000							
(9)	GDP	0.103*	0.217*	-0.081	-0.006	0.009	-0.208*	-0.046	0.140*	1.000						
(10)	GDPpercapita	-0.392*	-0.097	-0.577*	-0.313*	0.619*	0.214*	0.251*	0.841*	0.189*	1.000					
(11)	Globalization	-0.238*	0.060	-0.495*	-0.293*	0.716*	0.558*	0.466*	0.805*	0.099	0.699*	1.000				
(12)	Inflation	0.007	-0.102	0.135*	0.192*	-0.154*	-0.122	-0.153	-0.196*	-0.037	-0.112*	-0.207*	1.000			
(13)	Population	0.180*	0.207*	0.067	0.092	-0.196*	-0.160*	-0.164	-0.155*	0.548*	-0.152*	-0.204*	-0.010	1.000		
(14)	Right_Left	-0.117	-0.160*	-0.014	0.174*	-0.163*	-0.228*	-0.160	-0.030	0.154*	0.015	0.011	0.024	0.139*	1.000	
(15)	Unemployment Rate	0.170*	0.049	0.243*	0.173*	-0.070	0.126	-0.012	-0.262*	-0.152*	-0.287*	-0.197*	0.282*	-0.080	-0.342*	1.000

Notes: This table presents pairwise person correlation coefficients for all dependent and independent variables used in the analyses. * labels statistical significance at the 5% level.

Table 5: Democracy and Tax Complexity

	(1) Tax Complexity	(2) TimeTo Comply	(3) Tax Complexity	(4) TimeTo Comply	(5) Tax Complexity	(6) TimeTo Comply
Democracy_EIU	0.0065** [2.15]	27.6239*** [2.79]				
Democracy_BTI			0.0068*** [2.60]	39.1340** [2.46]		
Democracy_PRC					0.0007 [0.73]	9.7292*** [2.88]
Unemployment Rate	0.0012* [1.71]	1.5125 [0.63]	-0.0002 [-0.21]	3.2717 [0.90]	0.0033* [1.97]	13.3856 [1.64]
Population	0.0001 [0.67]	0.2693 [0.71]	0.0002 [1.45]	-0.4810 [-1.13]	0.0000 [0.08]	0.3883 [0.73]
GDP	0.0043*** [6.98]	4.9908** [2.35]	0.0012 [0.59]	22.1263 [1.49]	0.0033*** [4.86]	7.5809** [2.12]
GDPpercapita	-0.0064*** [-3.11]	-11.4119*** [-3.17]	-0.0120** [-2.21]	22.4117 [0.89]	-0.0108*** [-3.46]	-8.9276 [-1.61]
Inflation	-0.0002*** [-4.16]	1.1520*** [4.45]	-0.0001** [-2.21]	0.9931*** [3.11]	-0.0002** [-2.35]	0.4943 [0.96]
Corruption	-0.0125*** [-3.49]	-46.8103*** [-3.48]	-0.0144** [-2.45]	-81.8123** [-2.57]	0.0043 [0.79]	-42.6834*** [-3.00]
Year FE	YES	YES	YES	YES	YES	YES
Observations	362	357	240	236	144	144
Adj. R-sq	0.2076	0.1320	0.1343	0.0680	0.1190	0.0888

Notes: This table presents the estimates for Equation (1) for the dependent variables *TaxComplexity* and *TimeToComply*, indicating the complexity of the tax system. Democracy is measured using the democracy indices from the Economist Intelligence Unit (*Democracy_EIU*), the Bertelsmann Transformation Index (*Democracy_BTI*), and Political Regime Characteristics (*Democracy_PRC*). They express the quality of democracy in a given country. See Table 1 for definitions of the control variables. ***, ** and * label statistical significance at the 1%, 5%, and 10% level, respectively. A constant is included but not reported. t statistics are given in parentheses and standard errors are heteroscedasticity robust.

Table 6: Democracy and Tax Code and Framework Complexity

	(1) *TaxCode Complexity*	(2) *TaxFramework Complexity*	(3) *TaxCode Complexity*	(4) *TaxFramework Complexity*	(5) *TaxCode Complexity*	(6) *TaxFramework Complexity*
Democracy_EIU	0.0186***	-0.0056*				
	[4.83]	[-1.86]				
Democracy_BTI			0.0147***	-0.0012		
			[4.32]	[-0.41]		
Democracy_PRC					0.0040***	-0.0026***
					[2.96]	[-2.87]
Chi²	49.28		19.86		24.73	
Prob > Chi²	0.0000		0.0000		0.0000	
Controls	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	362	362	240	240	144	144
Adj. R-sq	0.1384	0.4028	0.1351	0.1578	0.1883	0.2669

Notes: This table presents the estimates for Equation (1) for the dependent variables *TaxCodeComplexity* and *TaxFrameworkComplexity*, indicating the complexity of the tax code and the tax framework. Democracy is measured using the democracy indices from the Economist Intelligence Unit (*Democracy_EIU*), the Bertelsmann Transformation Index (*Democracy_BTI*), and Political Regime Characteristics (*Democracy_PRC*). They express the quality of democracy in a given country. See Table 1 for definitions of the control variables. ***, ** and * label statistical significance at 1%, 5%, and 10% level, respectively. A constant and control variables are included but not reported. t statistics are given in parentheses and standard errors are heteroscedasticity robust.

Table 7: High and Low Democracy and Complexity

	(1) *Tax Complexity*	(2) *TimeTo Comply*	(3) *Tax Complexity*	(4) *TimeTo Comply*	(5) *Tax Complexity*	(6) *TimeTo Comply*
High Democracy	-0.0199 [-1.53]	-29.7402* [-1.91]				
Low Democracy			-0.0297*** [-3.17]	-114.1248*** [-2.61]		
Moderate Democracy					0.0294*** [3.92]	89.6065*** [2.67]
Controls	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	362	357	362	357	362	357
Adj. R-sq	0.2032	0.1152	0.2207	0.1425	0.2331	0.1408

Notes: This table presents the estimates for Equation (1) for the dependent variables *TaxComplexity* and *TimeToComply* indicating the complexity of the tax system. Democracy is measured using the democracy indices from the Economist Intelligence Unit (*Democracy_EIU*), the Bertelsmann Transformation Index (*Democracy_BTI*), and Political Regime Characteristics (*Democracy_PRC*). They express the quality of democracy in a given country. See Table 1 for definitions of the control variables. ***, ** and * label statistical significance at 1%, 5%, and 10% level, respectively. A constant and control variables are included but not reported. t statistics are given in parentheses and standard errors are heteroscedasticity robust.

Table 8: Complexity in the Arab Spring

Control	Arab League			PSM		
				1:1, noreplace	1:3, replace	1:5, replace
	(1)	(2)	(3)	(4)	(5)	(6)
	TimeToComply	*TimeToComply*	*TimeToComply*	*TimeToComply*	*TimeToComply*	*TimeToComply*
arab_spring	8.3549					
	[1.39]					
arab_spring_reform		15.6816***				
		[2.68]				
arab_spring_revolution			25.0440***	13.8238	28.0810**	28.1042**
			[2.81]	[1.47]	[2.38]	[2.38]
post_arab_spring	-4.5194	-9.0698	15.5810	9.4558	17.3930	6.8721
	[-0.14]	[-0.33]	[0.56]	[0.17]	[0.23]	[0.09]
treated_post	**-4.3400**	**-6.5948**	**-19.9660***	**-15.9550**	**-29.6771****	**-30.3671****
	[-0.55]	**[-0.82]**	**[-1.95]**	**[-1.48]**	**[-2.28]**	**[-2.34]**
Controls	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	120	120	120	118	86	86
Adj. R-sq	0.2402	0.2943	0.2648	0.1780	0.1892	0.1862

Notes: This table presents the estimates for Equation (2) for the dependent variable *TimeToComply* indicating the complexity of the tax system. The variable *treated_post* reflects the difference-in-differences estimates for the treatment groups *arab_spring, arab_spring_reform*, and *arab_spring_revolution*. In columns 1 to 3, the Arab League is defined as the control group. We apply propensity score matching in the models displayed in columns 4 to 6 to create the control group based on all control variables. See Table 1 for definitions of the control variables. ***, ** and * label statistical significance at 1%, 5%, and 10% level, respectively. A constant and control variables are included but not reported. t statistics are given in parentheses and standard errors are heteroscedasticity robust.

Table 9: Democracy and Single Regulation Complexity

Panel A

	(1) Additional Taxes	(2) Alternative Minimum Tax-ation	(3) Capital Gains/Losses	(4) CFC Rules	(5) Corporate Reorganization	(6) Depreciation	(7) Dividends	(8) General Anti Avoidance
Democracy_EIU	0.0411***	0.0414***	0.0175**	0.0422***	0.0282***	0.0060	0.0137**	0.0233***
	[6.99]	[7.32]	[2.32]	[4.65]	[4.61]	[1.39]	[2.48]	[3.79]
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	362	362	362	362	362	362	362	362
Adj. R-sq	0.2387	0.1921	0.0828	0.2449	0.2032	0.1085	0.0725	0.1525

Panel B

	(9) Group Treatment	(10) Interest	(11) Investment In-centives	(12) Loss Offset	(13) Royalties	(14) Statutory Tax Rate	(15) Transfer Pricing
Democracy_EIU	0.0344***	0.0068	0.0109*	0.0042	0.0068	0.0166***	0.0237***
	[4.95]	[1.54]	[1.70]	[0.84]	[1.54]	[2.72]	[3.19]
Controls	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Observations	362	362	362	362	362	362	362
Adj. R-sq	0.1564	0.0444	0.0896	0.0216	0.1604	0.1394	0.1053

Notes: This table presents the estimates for Equation (1) for the complexity of 15 single tax regulations. See Table 1 for definitions of the control variables. ***, ** and * label statistical significance at 1%, 5%, and 10% level, respectively. A constant and control variables are included but not reported. t statistics are given in parentheses and standard errors are heteroscedasticity robust.

Table 10: Rotated Factor Loadings and Eigenvalues of the Factors

Regulation	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Uniqueness
Dividends	**0.791**	0.320	0.205	-0.100	-0.043	-0.014	-0.057	0.025	0.215
Royalties	**0.777**	0.116	0.196	0.169	-0.046	0.130	-0.114	0.018	0.284
Depreciation & Amortization	**0.756**	0.196	0.194	0.281	0.026	0.032	0.203	-0.035	0.229
Interest	**0.723**	0.400	0.048	-0.038	0.093	0.099	-0.052	-0.129	0.276
Loss Offset	**0.696**	0.331	0.091	0.210	0.251	-0.002	0.237	0.028	0.234
Statutory Tax Rate	**0.667**	-0.042	0.410	0.101	0.054	0.034	-0.017	0.146	0.350
Capital Gains	**0.577**	0.523	0.178	0.018	-0.086	0.011	-0.065	0.112	0.337
CFC Rules	0.099	**0.774**	0.151	-0.084	0.093	-0.042	-0.004	-0.098	0.341
Corporate Reorganization	0.328	**0.745**	0.120	0.294	-0.067	-0.012	0.022	0.027	0.230
General Anti Avoidance	0.342	**0.663**	0.017	0.071	0.101	0.250	0.086	0.107	0.346
Transfer Pricing	0.294	**0.533**	0.193	0.030	-0.044	0.377	-0.016	-0.022	0.447
Group Treatment	0.159	**0.517**	0.229	0.069	0.354	-0.024	0.011	-0.013	0.525
Alternative Minimum Taxation	0.246	0.146	0.652	0.086	0.013	0.043	-0.074	0.027	0.477
Additional Taxes	0.348	0.267	0.642	0.051	0.043	0.018	0.100	-0.046	0.378
Investment Incentives	0.445	0.210	0.197	0.488	0.059	0.029	0.009	0.013	0.475
Eigenvalue	6.940	1.132	0.669	0.388	0.245	0.154	0.078	0.068	

Notes: This table presents the factors' rotated factor loadings and eigenvalues. According to Kaiser (1960) we only consider factors with eigenvalues greater than 1. Therefore, only Factor 1 and Factor 2 are considered in our analysis. Moreover, we display the uniqueness of the regulations.

Table 11: Factoranalysis

	(1) Computation Payment	(2) AntiTax Avoidance	(3) Computation Payment	(4) AntiTax Avoidance	(5) TaxComplexity	(6) TaxComplexity	(7) TimeToComply
Democracy_EIU	-0.0024	0.1938***	-0.0088	0.1576***		0.0052*	30.4133***
	[-0.06]	[4.50]	[-0.22]	[3.91]		[1.68]	[2.70]
Globalization			0.0498	0.2803***	0.0120***	0.0099**	-21.7271
			[0.60]	[4.15]	[2.91]	[2.33]	[-1.58]
Controls	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Observations	362	362	362	362	362	362	357
Adj. R-sq	0.1119	0.2776	0.1106	0.3166	0.2089	0.2146	0.1329

Notes: This table presents the estimates for Equation (1) for the complexity of Factors 1 and 2 from a factor analysis of the 15 regulations for the tax code captured by the Tax Complexity Index and the variables *TaxComplexity* and *TimeToComply* to measure tax system complexity. Democracy is measured using the democracy index from the Economist Intelligence Unit (*Democracy_EIU*) to express the quality of democracy in a given country. Globalization (*Globalization*) is measured by the KOF Globalization Index. See Table 1 for definitions of the control variables. ***, ** and * label statistical significance at 1%, 5%, and 10% level, respectively. A constant and control variables are included but not reported. t statistics are given in parentheses and standard errors are heteroscedasticity robust.

Table 12: Left- and Right-wing Democracies and Complexity

Panel A: Full Spectrum

Sample	Left	Right	Left	Right	Left	Right
	(1)	(2)	(3)	(4)	(5)	(6)
	TaxComplexity	*TaxComplexity*	*TaxCode Complexity*	*TaxCode Complexity*	*TaxFramework-Complexity*	*TaxFramework-Complexity*
Democracy_EIU	0.0192***	-0.0018	0.0373***	0.0081	0.0010	-0.0116
	[2.77]	[-0.24]	[4.77]	[0.91]	[0.11]	[-1.41]
F-Test	7.40		0.04		25.29	
Prob > F	0.0008		0.9600		0.0000	
Controls	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	125	79	125	79	125	79
Adj. R-sq	0.2710	0.2727	0.1883	0.2342	0.4504	0.4983

Panel B: Extremes

Sample	Left	Right	Left	Right	Left	Right
	(1)	(2)	(3)	(4)	(5)	(6)
	TaxComplexity	*TaxComplexity*	*TaxCode Complexity*	*TaxCode Complexity*	*TaxFramework-Complexity*	*TaxFramework-Complexity*
Democracy_EIU	-0.0538**	-0.0116	-0.0394	0.0634**	-0.0681**	-0.0865***
	[-2.15]	[-0.77]	[-1.51]	[2.52]	[-2.31]	[-6.70]
F-Test	10.07		2.25		16.49	
Prob > F	0.0001		0.0853		0.0000	
Controls	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	61	41	61	41	61	41
Adj. R-sq	0.3415	0.6263	0.2129	0.6332	0.4216	0.7869

Notes: This table presents the estimates for Equation (1) for the complexity of the tax system (*TaxComplexity*), the tax codes (*TaxCodeComplexity*), and the tax framework (*TaxFrameworkComplexity*) of a country and the association with democracy for the subsample right-wing and left-wing governments (Panel A) and extreme left- and right-wing governments (Panel B). Democracy is measured using the democracy index from the Economist Intelligence Unit (*Democracy_EIU*) to express the quality of democracy in a certain country. See Table 1 for definitions of the control variables. ***, ** and * label statistical significance at 1%, 5%, and 10% level, respectively. A constant and control variables are included but not reported. t statistics are given in parentheses and standard errors are heteroscedasticity robust.