# DETERMINANTS AND CONSEQUENCES OF TAX COMPLEXITY

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**Adrian Schipp**

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*I am deeply grateful to everyone who has helped and accompanied me on this journey.*

*I would never have made it this far without you.*

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# I     INTRODUCTION AND SYNOPSIS

*"The hardest thing in the world to understand is the income tax."*

– Albert Einstein[1]

This dissertation is about the determinants and consequences of tax complexity. It contributes to understanding a central problem of global tax systems, which Albert Einstein already addressed. In the quote mentioned above, Albert Einstein admitted to his tax advisor Leo Mattersdorf that the most difficult thing in the world to understand was not the theory of relativity, but income taxes.[2] Although, at least for non-physicists, Einstein probably overestimated the complexity of (income) taxation compared to the theory of relativity, nearly 70 years after the death of Albert Einstein, the complexity of the (income) tax systems is still prevalent. In recent years, tax complexity, as perceived by both taxpayers and tax administrators, has been steadily increasing, as shown by recent (survey) evidence from Devereux (2019), Bornemann, Schipp, and Sureth-Sloane (2021), and Harst et al. (2021). Accordingly, several countries, such as Brazil (Mayer Brown (2023)) and Germany (German Ministry of Finance (2024)), and supranational institutions such as the OECD (OECD (2020)), started initiatives to simplify tax regulations and tax procedures. While these initiatives aim to address symptoms and simplify overly complex tax systems, it is of particular importance to examine possible reasons (determinants) and outcomes (consequences) of complex tax systems because tax complexity is potentially harmful on the macro-level, as it may decrease tax revenue of economies (Bird, Martinez-Vazquez, and Torgler (2008), Besley and Persson (2014), OECD (2014)), as well as the micro-level, as it leads to excessive compliance costs for taxpayers (van der Geest and Jacob (2023)). In this dissertation, I go beyond the concept of measuring tax complexity and focus on the determinants and consequences of tax complexity. Correspondingly, this dissertation comprehends two studies regarding determinants ((A)[3] and (B)[4]) and one study regarding consequences of tax complexity (C)[5]. The focus of (A) by Schipp, Siahaan and Sureth-Sloane is on

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[1] https://www.forbes.com/quotes/195/.

[2] https://quoteinvestigator.com/2011/03/07/einstein-income-taxes/.

[3] Schipp, Adrian, Fernando Siahaan, and Caren Sureth-Sloane, "Determinants of Tax Complexity in Tax Regulations and Tax Procedures – Evidence from a Developing Country", TRR 266 Accounting for Transparency Working Paper No. 151, WU International Taxation Research Paper Series No. 2024-05.

[4] Giese, Henning and Adrian Schipp, "The Downsides of Democracy? – The Case of Tax Complexity", TRR 266 Accounting for Transparency Working Paper No. 153, TAF Working Paper No. 95.

[5] Schipp, Adrian, "Too Complex to Cooperate? – Tax Complexity and Cooperative Compliance", TRR 266 Accounting for Transparency Working Paper No. 152, TAF Working Paper No. 94.

the determinants of tax complexity in tax regulations and tax procedures in a developing country. In (A), we present the results of a survey in Indonesia to derive in-depth insights into the determinants of tax complexity, particularly for developing countries. This contributes to the work of Hoppe et al. (2023) by modifying and expanding their survey instrument, which was developed to measure the tax complexity faced by multinational corporations worldwide, to a tax administration in a developing country. Study (B) by Giese and Schipp has a much broader scope and investigates the degree of democratization of a country as a possible determinant for tax complexity. (C) is a single-authored study by myself that examines the consequences of complex tax systems in cooperative compliance programs. (CCPs)

The motivation to investigate the determinants of tax complexity in a developing country (A) is that developing countries are frequently challenged with problems in their legislative, fiscal, and administrative capacities. These factors can intensify tax complexity and undermine investment attractiveness and tax revenue collection (Bird, Martinez-Vazquez, and Torgler (2008), Besley and Persson (2014), OECD (2014)). Since these problems are prevalent and well-known in developing countries, they frequently try to implement simplifications to their tax systems. Nevertheless, developing countries are prone to create an overly complex regulatory environment (Oliver and Bartley (2005)). Understanding the determinants of tax complexity in developing countries is crucial, given that 70% of global foreign direct investment (FDI) is directed towards these countries (UNCTAD (2023)). FDI is a key driver of economic growth and tax revenues for these countries (Amberger, Gallemore, and Wilde (2023)). There is evidence that tax complexity is harmful for FDI (Euler et al. (2024)), tax complexity potentially harms compliance (Milliron (1985), Saad (2014), Ulph (2015)), and presents tax planning opportunities for taxpayers (Krause (2000)). Therefore, understanding and reducing tax complexity is essential for developing countries.

In (A) we measure tax complexity through a survey among tax administrators in Indonesia, as an example of a developing country. We adapt the instrument from the Tax Complexity Index developed by Hoppe et al. (2023) and modify this construct to reflect the peculiarities of Indonesia's tax system and benchmark our findings against global evidence and other developing countries. In (A), we focus on Indonesia as a prominent developing country since Indonesia has a well-documented issue with tax complexity and is often cited as one of the most challenging environments for businesses worldwide

(World Bank (2020), TMF Group (2023)). The Tax Complexity Index consistently placed Indonesia in the top quintile of the world's most complex tax systems since 2016. Moreover, Indonesia's tax-to-GDP ratio is significantly low at 10.3% in 2021, compared to the OECD average of 34.1% (OECD (2023)). This makes Indonesia one of the most promising developing countries worldwide. Understanding tax complexity as a barrier to economic growth and compliance is crucial for identifying opportunities to enhance the tax system and unlock Indonesia's economic potential.

In (A), we identify transfer pricing, statutory tax rates, and dividends as the most complex tax regulations. Tax law enactment and tax appeals are perceived as the most complex tax procedures. This is partly in contrast to the global evidence,[6] which indicates that statutory tax rates, dividends, tax law enactment, and appeals are not perceived as highly complex on average. However, tax complexity perceptions also vary among specific participant groups in Indonesia. Tax officers perceive tax regulations as more complex than tax procedures. Mostly, this is due to ambiguity in the regulations. In contrast, corporate taxpayers, which we investigate in an additional survey, perceive tax procedures as more complex than tax regulations, particularly tax audits. Tax officers in dispute resolution find permanent establishment regulations particularly complex, while small-taxpayer officers and firms do not. In contrast, these two groups perceive loss offset regulations and tax guidance procedures as highly complex. Our findings provide a nuanced picture of tax complexity in a developing country and helpful insights into the perceptions of multiple stakeholder groups in Indonesia. They also serve as a starting point for further analysis of developing countries. Nevertheless, one has to be careful when extrapolating the results to other countries and take the different constitutional environments and peculiarities of differing stakeholder groups into account.

(A) contributes to the existing literature on tax complexity, particularly within the context of developing countries, in two ways. Firstly, in (A), we are the first to modify a survey instrument for tax complexity from the literature for the peculiarities of a developing country which allows us to dig deep into the determinants of tax complexity in Indonesia. Our findings reveal that in some cases in developing countries, tax regulations and procedures are perceived as highly complex, while they may not be perceived as particularly complex in developed countries. Therefore, (A) adds to the literature by

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[6] See https://www.taxcomplexity.org/.

incorporating the institutional peculiarities of a developing country into the literature of the determinants of tax complexity. Secondly, (A) provides insights into varying perceptions of tax complexity across different stakeholder groups. Recognizing the nuanced differences in tax complexity is essential for policymakers endeavoring to alleviate tax complexity and effectively simplify the tax system.

The scope of study (B) is much broader than the scope in (A). (B) opens up the single-country in-depth investigation from (A) to a multi-country setting. This allows many different facets of multiple countries and their tax systems to be considered and broader conclusions to be drawn from the results. (B) adds to the dissertation by providing evidence about the relationship between democracy and the complexity of countries' tax systems. The motivation for (B) is to investigate the determinants of tax complexity from a legislative perspective on the macro (country) level. Prior literature did not investigate this relationship, which is surprising, as, e.g., Paul (1997) finds that tax complexity results from the "desire for equitable distribution of tax liabilities and the desire for certainty of application".[7] Additionally, Diller, Grottke, and Schneider (2013) argue that tax complexity is naturally tied to a complex world that needs to be regulated. Therefore, they state that tax complexity is an inherent feature of the tax system. Since implicitly, these studies recognize that political aspects are crucial determinants of the complexity of the tax system, none of the existing studies bridges the gap and investigates how the way societies structure themselves and the complexity of the tax system are related. Since the structure of modern societies can be classified on a spectrum between democracy and autocracy, we argue in (B) that democracies, in contrast to autocracies, are associated with higher levels of tax complexity because democracies tend to incorporate as many individual interests as possible into their legal systems and therefore their tax systems are highly complex (Galli and Profeta (2009), OECD (2017), Krieger (2022)).

In (B), firstly, we provide evidence that democracy and overall complexity in the tax system are positively associated and therefore democracy is a determinant of tax complexity. A higher level of democracy is associated with a higher level of complexity in the tax system. Secondly, we identify contradictory associations of democracy with tax code and tax framework complexity. While the excessive legislative process leads to more complex tax regulations (4.9%), the procedures in democracies are less complex (3.6%). Nevertheless, we find the excessively complex tax regulations to outweigh the

[7] See Paul (1997), p. 157.

benefits of less complex tax procedures in democracies. Moreover, we find an inversely U-shaped relationship between democracy and complexity. This indicates that extreme democracies and extreme autocracies are associated with less complex tax systems, while moderate democracies drive our overall association between democracy and tax complexity. In additional tests, we investigate the drivers of increased complexity in democracies and heterogeneity regarding the political orientation of the ruling party. We use a factor analysis of the captured tax regulations and find that the complexity of anti-tax avoidance regulations, i.e., those regulations designed to restrict tax avoidance by multinational corporations, particularly increase in the level of democracy and therefore are a strong determinant of this association. In heterogeneity tests, we investigate the association of right- and left-wing governments in democracies and tax complexity. In line with our hypothesis, based on Alesina, Stantcheva, and Teso (2018), we find that the positive association of democracy and complexity of tax systems is persistent for left-wing but not for right-wing governments. However, we document no difference between the associations of left- and right-wing governments and the complexity of tax procedures.

Our findings from (B) add to the literature in two ways. First, we extend the literature on real effects of democracy and identify tax complexity in regulatory systems to be a by-product of democratization. Second, we also contribute to the literature on determinants of tax complexity. As granular determinants of tax complexity, such as internationally introduced regulations like CFC rules, have been identified in the recent past (Devereux (2019), Siegel, Schanz, and Sureth-Sloane (2022)), evidence about political aspects driving tax complexity is missing. Moreover, the findings from (B) have important implications for policymakers and decision-makers in firms. We identify tax complexity to be a by-product of democratization and, therefore, the introduction of multiple interests in legal systems. By doing this, we shed light on potentially disregarded costs and risks of regulatory complexity since tax complexity is potentially harmful to foreign direct investment (Euler et al. (2024)) and the effectiveness of investment incentives (Amberger, Gallemore, and Wilde (2023)). Our results might be interesting for businesses as well, as investment in democratic countries may be seen as less risky due to higher legal certainty (Zagler (2023)), but can be more costly in terms of complexity-induced costs, such as increased compliance costs for businesses (Kaplow (1998), Krause (2000), van der Geest and Jacob (2023)).

While (A) and (B) investigate determinants of complex tax systems, (C) is a study about the consequences of tax complexity. In (C), I investigate whether, how, and under what conditions complexity in the tax system can attenuate the positive association between cooperative compliance programs[8] and tax compliance. Multinational organizations recommend CCPs to alleviate tax uncertainty and enhance tax compliance by building on cooperation with taxpayers rather than deterrence (OECD (2013), International Chamber of Commerce (2019)). In (C), I argue that the introduction of a CCP is a signal from the tax authority to the taxpayers of the intention to follow a cooperative approach towards a trustful relationship. This signal does not only influence eligible taxpayers but may spill over towards all taxpayers because trust signals from prosocial institutions spread (Engl, Riedl, and Weber (2021), Fochmann, Müller, and Overesch (2021)). The slippery slope model (Kirchler, Hoelzl, and Wahl (2008)) is the theoretical basis for this study and indicates that compliance by taxpayers can be established via two channels: trust in the tax authorities and power of the tax authorities. Therefore, the increased trust between tax authorities and taxpayers through the signaling effect of a CCP should be positively associated with tax compliance. However, according to the slippery slope model, complexity in the tax system may violate the trust as well as the power dimension and is, therefore, a potential harm to the positive association between CCPs and tax compliance. The relationship between tax complexity and tax compliance is heavily discussed in the literature. While some studies find tax complexity to increase tax compliance, e.g., through increased fairness of highly complex tax systems (McKerchar, Ingraham, and Karlinsky (2005)), the majority of the literature supports the theoretical expectation of the slippery slope framework and proposes tax complexity to decrease tax compliance (Milliron (1985), Saad (2014), Ulph (2015)). Therefore, I hypothesize in (C) that tax complexity attenuates the increase of tax compliance associated with CCPs.

In the main analyses of (C), I conduct empirical cross-country analyses on country level data. The results presented in (C) partly confirm the hypothesized association. I find that high levels of tax code complexity attenuate the signaling effect of CCPs on tax compliance. Contrastingly, the attenuation

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[8] I do not include International Compliance Assurance Programs (ICAP) into to scope of this study, since these are multinational tools. So, these programs are not only designed by and for single countries. The signaling effect of the implementation of these programs will differ from CCPs in the sense of this study.

of the positive association of CCPs and tax compliance is not present in countries with highly complex tax frameworks. Countries with a CCP in place and a high level of tax framework complexity appear to have a 4.83% lower value for non-compliance. Contrastingly, countries with a highly complex tax code having a CCP in place show 4.73% more non-compliance. This indicates that the consequences of tax complexity may vary depending on the source of complexity. To investigate the result that tax code complexity attenuates the increase of tax compliance associated with CCPs from the country-level analyses in more detail, I conduct single country studies with firm-level data in two countries with CCPs in place, Austria and Italy. Italy is a highly tax complex country, especially in terms of tax code complexity. The complexity of Austria's tax code is rather moderate. I expect the signal of having a CCP in place to affect eligible companies more strongly, even if they decide to not participate in the program because they receive a direct possibility to cooperate with the tax authority. According to this expectation, in the absence of tax code complexity, CCP-eligible companies should have higher ETRs because of less non-compliance due to the trust increasing effect of the eligibility to participate in the CCP. I document lower ETRs for CCP-eligible firms in Austria, the moderate tax code complex country. Contrastingly, I do not find higher ETRs for Italian CCP-eligible firms. This result might be due to the extremely high levels of tax code complexity in Italy and underlines that the positive influence of a CCP on tax compliance may vanish due to tax code complexity.

(C) is the first study to exploit the consequences of tax complexity in CCPs and the attenuation of the compliance effect of CCPs in a cross-country setting. Through empirical analyses, this study establishes a basis for subsequent tax compliance analyses. Moreover, (C) adds to the sparse literature on the outcome and evaluations of CCPs. Additionally, (C) provides evidence of differing consequences of tax code and framework complexity on tax compliance. This indicates that policymakers, not only in CCPs, should consider tax complexity and its different facets when deciding about the introduction of certain policy tools.

This dissertation provides evidence on the determinants of tax complexity in developing countries (A), identifies policy features that crucially determine the complexity of tax systems (B), and shows the consequences of tax complexity in cooperative compliance environments (C). Nevertheless, tax complexity is a multidimensional and multifaceted construct, which is naturally linked to a complex

world to be regulated (Diller, Grottke, and Schneider (2013)), and therefore might crucially influence decisions of tax administrators, taxpayers, and policymakers. Even if the literature has made important developments in the effort to measure tax complexity (Hoppe et al. (2023)), the determinants and consequences of tax complexity are still understudied. In particular, economic and societal developments, such as ongoing digitalization and globalization, will change the complexity of the tax system and steer it in certain directions, thus influencing the determinants and consequences of tax complexity. The literature reviewed in sections (A) to (C) illustrates the diversity of existing views on tax complexity and demonstrates the importance of frequent and further research on the determinants and consequences of tax complexity beyond the scope of this dissertation.

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**II      STUDIES OF THE DISSERTATION**

# (A) Determinants of Tax Complexity in Tax Regulations and Tax Procedures – Evidence from a Developing Country[*]

**Adrian Schipp**
Paderborn University
Department of Taxation, Accounting and Finance
adrian.schipp@upb.de

**Fernando Siahaan**
WU Vienna University of Economics and Business
Department of Finance, Accounting and Statistics
fernando.siahaan@wu.ac.at

**Caren Sureth-Sloane**
Paderborn University
Department of Taxation, Accounting and Finance and
WU Vienna University of Economics and Business
caren.sureth@upb.de

## Abstract

This study investigates the determinants of tax complexity in Indonesia, focusing on the perspectives of tax officers and firms, providing a case study relevant to developing countries. Understanding tax complexity in these contexts is crucial, as developing nations frequently encounter legislative, fiscal, and administrative challenges that exacerbate tax complexity. Such complexity can potentially hinder investment, impair tax revenue collection, and impede overall economic development. We adapt a global survey instrument to Indonesia and collect responses from Indonesian tax officers and firms. We identify transfer pricing, statutory tax rates, and dividends as the most complex tax regulations. Tax law enactment and tax appeals are perceived as the most complex tax procedures. This is in part in contrast to the global evidence, where statutory tax rates, dividends, tax law enactment, and appeals are not perceived as highly complex on average. Furthermore, comparative analyses show that tax officers perceive tax regulations as more complex than tax procedures, for example, transfer pricing regulations. This is often due to ambiguity in the regulations. In contrast, firms perceive tax procedures as more complex than tax regulations, particularly tax audits. Our findings provide a nuanced picture of tax complexity in a developing country and helpful insights and guidance for tax reforms in Indonesia. They also serve as a starting point for further analysis of developing countries.

# 1 Introduction

In this study, we investigate the determinants of tax complexity in a developing country, using Indonesia as a key example. Developing countries often grapple with challenges in their legislative, fiscal, and administrative capacities, which can intensify tax complexity, undermining investment attractiveness and tax revenue collection (Bird, Martinez-Vazquez, and Torgler (2008), Besley and Persson (2014), OECD (2014)). Although previous research has examined tax complexity for multinational companies across multiple countries Hoppe et al. (2023), a detailed analysis of the specific determinants of tax complexity within developing countries remains underexplored.

Understanding tax complexity in these regions is crucial, as 70% of the world's foreign direct investment (FDI) flows into developing countries (UNCTAD (2023)). Reducing tax complexity is essential to attract FDI, a key driver of economic growth and tax revenues (Amberger, Gallemore, and Wilde (2023), Hoppe et al. (2023)). Research indicates that tax complexity can deter FDI and compliance while also presenting tax planning opportunities (Krause (2000)). Furthermore, firms facing significant country-level risk and tax complexity tend to respond less effectively to investment incentives (Amberger, Gallemore, and Wilde (2023), Osswald and Sureth-Sloane (2024)).

Developing countries encounter unique challenges in managing tax complexity due to economic informalities, limited administrative capacity and heightened tax base erosion from global tax competition (Crivelli, Keen, and de Mooij (2016)). Tax uncertainty, fueled by inconsistent or unpredictable tax administration and a lack of reliable dispute resolution mechanisms, impedes investment and tax revenue collection (IMF and OECD (2019), Ferguson, Krupa, and Laux (2024)). Despite often implementing simplified tax regimes, developing countries may inadvertently create an overly complex regulatory environment (Oliver and Bartley (2005)). Additionally, low voluntary compliance and limited administrative capacity further exacerbate these challenges (Ahmed (2012), Carnahan (2015)).

While Hoppe et al. (2023) offer valuable insights into perceived tax complexity across countries, their cross-country approach still needs granularity to fully comprehend the specific determinants of tax complexity in a single developing country. Our study addresses this gap by focusing on Indonesia, examining the perspectives of both tax authorities and firms with varying characteristics. By

acknowledging the diversity in stakeholders' perspectives and focusing on Indonesia's unique tax system, we aim to identify the drivers of tax complexity more precisely, thereby providing targeted insights for policymakers. Moreover, prior single-country studies have predominantly focused on developed nations, including the United States (Slemrod (2005)), Australia (Tran-Nam, Lignier, and Evans (2016)), Germany (Bornemann, Schipp, and Sureth-Sloane (2020)), and United Kingdom (Office of Tax Simplification (2022)), with South Africa (Hoppe et al. (2019)) being an exception.

We measure tax complexity through a survey, adapting the instrument from the Tax Complexity Index developed by Hoppe et al. (2023) to suit the specific context of Indonesia. Their comprehensive approach evaluates the complexity of corporate income tax systems across 15 dimensions of tax regulations (tax code complexity) and five dimensions of tax procedures (tax framework complexity). We modify this construct to reflect the nuances of Indonesia's tax system and benchmark our findings against global evidence and other developing countries.

Our study focuses on Indonesia, a nation with a well-documented issue of tax complexity, often cited as one of the most challenging environments for businesses (World Bank (2020), TMF Group (2023)) while being one of the most promising developing economies. The Tax Complexity Index consistently places Indonesia in the top quintile of the world's most complex tax systems since 2016. Moreover, Indonesia's tax-to-GDP ratio is significantly low at 10.3% in 2021, compared to the OECD average of 34.1% (OECD (2023)). Understanding tax complexity as a barrier to economic growth and compliance is crucial for identifying opportunities to enhance the tax system and unlock Indonesia's economic potential.

We conducted our survey among tax officers and firms in Indonesia, with approval and assistance from the Directorate General of Taxes (DGT). The survey was disseminated to 27 out of 50 echelon II units, including various regional offices and directorates. Our sample encompasses tax officers from all types of units, handling firms of different functions, industries, and sizes. Additionally, we surveyed a selection of corporate taxpayers, representing the main stakeholders in the tax system. This approach contributes to the literature, which has predominantly focused on either taxpayer and tax advisors (Ingraham, Karlinsky, and McKerchar (2005), Gupta (2011), Hoppe et al. (2023)), or tax administrations (Bornemann, Schipp, and Sureth-Sloane (2020)). Given the differing, and sometimes opposing,

objectives of tax administrations and taxpayers, capturing the perceived complexity from both perspectives is vital for a comprehensive understanding of tax complexity.

We collect a total of 476 responses, comprising 391 from tax officers and 85 from corporate taxpayers.[1] While tax officers comprise the majority (82.1%) of our sample and are the basis for our main analyses, we recognize the importance of valuing both groups' perspectives. Therefore, in additional comparative analyses, we contrast the viewpoints of tax officers and firms regarding selected aspects.

We first explore the respondent's view on the overall role of tax complexity including its significance, trends, costs and benefits, and potential solutions. In general, the respondents state that tax complexity has become a serious issue in Indonesia and increased over the past five years. Furthermore, tax complexity seems to have become a concern primarily regarding tax compliance, tax dispute and tax risk. Finally, we find that the respondents expect the use of information technology and the primary use of principle-based regulation as potential avenues to mitigate the excessive negative impact of tax complexity.

Our main results indicate that transfer pricing regulations, statutory tax rates, and dividends are perceived as the most complex tax regulations. In tax procedures, the most complex procedures are law enactment and tax appeals. Notably, our results from a developing country context, diverge from the global average (Tax Complexity Index, Hoppe et al. 2023) in two aspects. First, while statutory tax rates and dividends are globally considered moderately complex, they rank as the most complex tax regulations in Indonesia. This heightened complexity may be attributed to Indonesia's highly detail of statutory tax rates and rigid computation methods, as well as a principle-based definition of dividends that captures hidden payments and imposes stringent conditions for tax exemptions. Additionally, rapid recent amendments have further complicated these regulations. Second, while tax law enactment and tax appeals are globally viewed as moderately complex, they are perceived as highly complex in Indonesia. This complexity arises from third-party influences in tax law enactment and inconsistent decisions in tax appeals. These findings highlight specific areas for complexity mitigation reform and showcase the uniqueness of a developing country.

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[1] Our survey covers all types of corporate taxpayers including corporations and partnerships.

In our first comparative analysis, we examine variations in perceived tax complexity between tax officers and firms. The results indicate that tax officers generally view tax regulations as more complex, while firms find tax procedures more complex. Despite differences in overall tax complexity ratings, both groups agree that transfer pricing and statutory tax rates are the most complex regulations. However, instead of dividend, firms perceive loss offset as the third complex regulation. Firms also consider tax guidance and tax audits to be the most complex procedures, aligning with the global average from the Tax Complexity Index.

Our second analysis compares perceived tax complexity between two core functions within the tax authority: revenue collection and dispute resolution. Both functions are significantly impacted by tax complexity, according to our survey. The only significant difference in perceived regulation complexity is in permanent establishment, which is seen as more complex by dispute resolution officers. They view this regulation as ambiguous and open to multiple interpretations. Similarly, in the tax framework, both groups perceive comparable levels of complexity across procedures, except for tax guidance, which is seen as more complex by dispute resolution officers. The dispute resolution subgroup views the rise in tax disputes as a primary concern related to tax complexity.

In our third analysis, we explore perceived tax complexity among tax officers overseeing different sizes of taxpayers, small versus large/medium-sized taxpayers. Small-taxpayer officers find tax loss offset to be one of the most complex regulations. Given the importance of loss offsets as a tax incentive for economic growth, these findings highlight a critical area for improvement in the tax system. Additionally, small-taxpayer officers regard tax guidance as one of the most complex procedures, underscoring the need for support to help small firms navigate the tax code.

Collectively, our analyses reveal that certain regulations and procedures, such as transfer pricing, statutory tax rates, and tax law enactment, are perceived as complex across tax officers and firms. However, complexity perceptions also vary among specific groups in Indonesia. For example, firms find audit procedures particularly complex, while tax officers do not. Dispute resolution officers find permanent establishment particularly complex, while small-taxpayer officers and firms do not but emphasize the complexity of loss offsets and tax guidance, which, for example dispute resolution officers do not consider as highly complex. These findings suggest that policymakers need to prioritize

for each regulation and procedure in terms of how important it is to reduce tax complexity at all and whether to reduce it broadly across all stakeholders or for just one specific group.

Our research contributes to the existing literature on tax complexity, particularly within the context of developing countries, in two ways. Firstly, we develop a survey instrument for a developing country which allows us to identify the most complex regulations and procedures. Our findings highlight that specific tax regulations and procedures, that do not seem to incorporate a high level of tax complexity in developed countries, turn to being perceived as highly complex in a developing. For example, we find statutory tax rates, dividend taxation, tax law enactment, and tax guidance as highly complex.

Secondly, our research sheds light on how the perception of tax complexity varies across different stakeholder groups. Notably, factors such as stakeholder type, function, and size shape distinct perceptions of tax complexity. Recognizing the nuanced differences in tax complexity is essential for policymakers endeavoring to alleviate the burden of tax complexity to enhance compliance and the quality of the investment environment in a developing country. Our study provides valuable insights for policymakers seeking to tailor strategies and interventions to address tax complexity effectively for diverse stakeholder groups. Our single-country evidence provides important insights that can be also relevant for studies in the other developing countries.

## 2 Tax Complexity

Tax complexity refers to the intricate nature of tax regulations and procedures, which arises as a natural outcome of tax system reforms aimed to balance between efficiency and equity (Kaplow (1998), Cuccia and Carnes (2001), Hoppe et al. (2023)). Given the absence of standardized parameters for defining tax complexity, its measurement lacks consensus and agreement (Long and Swingen (1987)). As a multidimensional concept, tax complexity involves a comprehensive assessment across various facets of a tax system. Noteworthy among these efforts is the Tax Complexity Index developed by Hoppe et al. (2023). They comprehensively measure the perceived complexity of corporate income tax systems across countries and time. They use the definitions provided by Hoppe et al. (2018), that tax complexity is a feature of the tax system that arises from the difficulty of reading, understanding, and complying

with the tax code, as well as from various issues within the tax framework. This survey-based index is a composite of two equally weighted subindexes: tax code (regulation) complexity and framework (procedure) complexity.

Tax code complexity refers to the complexity inherent in the most complex regulations that had been identified previously (Hoppe et al. (2018)). The complexity of each regulation depends on five complexity drivers: ambiguity and interpretation, change, computation, detail, and record-keeping (Hoppe et al. (2023)). The original survey instrument covers the 15 most complex regulations: (alternative) minimum tax, additional local and industry-specific income taxes, capital gains and losses, controlled foreign corporations, corporate reorganization, depreciation and amortization, dividends, general anti-avoidance, group treatment, interest, investment incentives, loss offset, royalties, statutory corporate income tax rate, and transfer pricing.

We adjust their representation of tax code complexity and delete regulations that do not apply to Indonesia and add the regulations of permanent establishments. Permanent establishment regulation is increasingly important for Indonesia as a growing economy and a target country for foreign direct investment. Indonesia introduced new permanent establishment regulations in 2019.[2] Since the literature emphasizes the strategic role of implementing and designing permanent establishment regulations (Steenkamp (2014)), their complexity might be an important issue. This is even more important as in an era where numerous corporations conduct cross-border business, the concept of permanent establishment that governs the taxation rights over foreign profits becomes increasingly pertinent in corporate taxation (Bellemare (2017), Garbarino (2019)). Corporations strategically focus on optimizing tax advantages and mitigating disadvantages by restructuring business operations through permanent establishments (PwC (2013)). Simultaneously, governments are proactively refining regulations to counteract artificial avoidance of permanent establishment through unilateral and multilateral legal frameworks. For example, OECD BEPS Action 7 mandates countries to redefine permanent establishment definitions to curb exceptions' exploitation and align with the evolving digital economy landscape. Additionally, precise profit attribution computations required by permanent establishment regulations further amplify their complexity.

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[2] Indonesian Ministry of Finance Regulation No. 35/PMK.03/2019.

Tax framework complexity encompasses five dimensions of procedures: tax guidance, tax law enactment, tax filing and payment, tax audits and tax appeals and objections (Hoppe et al. (2023)). Tax guidance involves the provision of guidance by the tax authority or by written or soft law to clarify uncertain tax treatments or procedures. Tax law enactment is a dimension that deals with the process of how tax regulations are enacted, starting with discussions of changes in tax law and culminating in the regulation becoming effective. Tax filing and payment covers the process of preparing and filing tax returns, as well as the payment and refund of taxes. Tax audits represent the examination of tax returns by the tax authority and the extent to which these audits can be anticipated and prepared. Finally, tax appeals encompass the process from filing an appeal with the responsible institution to its resolution at the administrative or judicial appeal level.

Several studies indicate that taxpayers' stances on tax complexity are mixed, with a prevailing inclination towards simplification rather than increased complexity (Blesse, Buhlmann, and Dörrenberg (2020)). The literature provides several reasons why tax complexity might disadvantage taxpayers, for instance, individual taxpayers sacrifice or underreact to tax incentives because of a complex tax system (Aghion et al. (2018), Abeler and Jäger (2021)), tax complexity increases compliance costs (Kaplow (1998), Krause (2000)), and introduces uncertainty in tax positions (Krause (2000)). However, a specific level of tax complexity is seen as inevitable and crucial (Krause (2000)). A complex tax scheme allows for better and more appropriate differentiation of individuals (Kaplow (1998), Galli and Profeta (2009)). Tax complexity might also benefit taxpayers, for example, by providing tax planning opportunities (Krause (2000)).

Tax authorities, whose main function is to ensure compliance with the tax law, also face costs and benefits of tax complexity. On the one hand, tax authorities receive tax revenue from risk-averse taxpayers who forgo complex tax opportunities or incentives (Krause (2000)) or penalties from taxpayers' inability to fully comply with the complex system. On the other hand, tax authorities lose revenue due to taxpayers' exploitation of tax complexity and due to costly and highly uncertain audit outcomes (Krause (2000)). Empirical evidence showing an inclination toward simplification or more complex regulations and procedures, however, yet is missing.

Since tax complexity is an inevitable byproduct of tax reforms that aim to balance between efficiency and equity (Kaplow (1998), Cuccia and Carnes (2001), Hoppe et al. (2023)) governments need to manage the level of complexity to an optimal degree and mitigate the undesired aspects of tax complexity.

## 3   Indonesian Tax System

According to (Hoppe et al. (2023)), Indonesia's tax system exhibits high complexity in both tax regulations and procedures, a phenomenon that contrasts with the expectation of a developing country having simpler tax regulations (OECD (2014)). This intriguing observation points to an unusual pattern of excessive tax complexity in Indonesia's tax regulation. According to the Tax Complexity Index for 2016 to 2022,[3] Indonesia consistently ranks in the top quartile of the most complex taxation systems.[4] Also in other tax-related indices, Indonesia is recognized for its high complexity in doing global business, ranking as the 6th most complex country in 2021, and the 11th in both 2022 and 2023, out of 78 countries (TMF Group (2021), TMF Group (2022), TMF Group (2023)). In the 2020 Ease of Filing and Paying Taxes index[5] developed by PwC and the World Bank Group, Indonesia ranked 81st out of 191 countries.

In terms of tax collection ratios, Indonesia's tax-to-GDP ratio stood at 10.9% in 2021, which is 23.2 percentage points below the OECD average of 34.1% (OECD (2023)). Notably, corporate income tax contributes significantly, accounting for 28.9% of national tax revenues, well above the OECD average of 9.0% (OECD (2023)). This lower tax collection ratio can be attributed not only to the dominant presence of informal sectors in the country's economic structure but also to limited institutional capacity (Aizenman et al. (2019), OECD (2023)).

As a developing country, Indonesia must offer a competitive tax system to attract investors. The fundamental reform of the income tax system in Indonesia dates to 1983 when the government

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[3] We thank Deborah Schanz, Caren Sureth-Sloane, and their teams for sharing data collected in their Global MNC Tax Complexity survey since 2016 provided at www.taxcomplexity.org.

[4] For instance, in 2022, Indonesia ranked 9th out of 64 countries on the Tax Complexity Index. The ten countries with the highest tax complexity are as follows: 1) Peru, 2) Poland, 3) Israel, 4) Canada, 5) Italy, 6) Belgium, 7) Pakistan, 8) Romania, *9) Indonesia*, and 10) Czech Republic.

[5] Source: https://www.pwc.com/gx/en/services/tax/publications/paying-taxes-2020/overall-ranking-and-data-tables.html.

consolidated several tax laws into a single income taxation law, replacing colonial-era laws inherited from the Netherlands, such as corporate taxation (1925), wealth taxation (1932), and income taxation (1944), as well as post-independence laws like interest, dividends, and royalty taxation (1970). Since first enacted (1983), the income tax law has undergone six amendments until now: 1991, 1994, 2000, 2008, 2020, and 2021.

The pace of change in income tax-related regulations in Indonesia has accelerated significantly in the last decade, with the introduction of key legislations such as the tax amnesty law (2016), fiscal policies in response to COVID-19 (2020), the job creation law (2020), and the harmonization of tax regulations law (2021). In contrast to the initial four iterations of the income tax law, which were contained within a single standalone statute, recent amendments have taken the form of omnibus (collective) legislation aimed at consolidating various regulations. This shift has resulted in a proliferation of new and modified provisions, potentially contributing to increased complexity of income tax law.

## 4    Survey Instrument

To assess the perceived complexity of taxation and obtain insights into various perspectives on this matter, we conducted an online survey involving both taxpayers and tax officers. This survey comprises two primary sections: one focused on the perception of tax code and tax framework complexity and the other on the respondents' perspectives on tax complexity, for example, on avenues for tax simplification. At the end of the survey, we gathered demographic information from the participants. We provide the survey instrument and our measurement strategy in the Appendix 1 and 2, respectively.

The first section of the survey aims to measure the level of tax complexity perceived by the respondent (tax officer or taxpayer). We adopt the survey instrument developed by Hoppe et al. (2023) for our study, specifically, tailoring it to the Indonesian tax landscape. For that purpose, we exclude specific questions that were either irrelevant or only minimally applicable to the Indonesian tax context. For instance, we omit questions related to additional local and industry-specific income taxes, alternative minimum taxes, and group treatment, as these concepts do not exist in the Indonesian tax system. We

also remove questions that inquire about the existence of specific tax procedures that are not in place in Indonesia. For instance, questions concerning whether tax legislation procedures are defined by the law, whether taxpayers can change their taxation year, and whether tax authorities provide instructions on filing tax returns. To streamline the survey and keep dropout rates at a minimum, we consolidate several questions into matrix questions. Furthermore, we modify several yes/no questions into five-scale response options to capture wider variability of the response.

In addition, we introduce two new questions to the original survey. First, we added a question on permanent establishments to the questions on tax complexity in regulations. This addition was prompted by Indonesia's efforts, as a developing country, to combat tax avoidance by multinational corporations, which involves tightening the administration of permanent establishment taxes.[6] In the tax framework complexity, we added a question about stakeholders' involvement in the tax legislation process. This question is important as it enables us to explore the extent of stakeholders' involvement in the tax legislation process, thereby shedding light on stakeholders' contributions to the overall complexity of the tax system.

In the second section of the survey, we explore the stakeholders' perspectives on tax complexity. Specifically, we aim to understand potential desires for simplification in the tax system. To do so, we compare stakeholders' perceived level of tax complexity with their expectations regarding the optimal level of complexity. The disparity between these two values reflects their inclination or tolerance toward less or more tax complexity. We also ask whether and how tax complexity provides advantages or disadvantages to stakeholders. Next, we ask participants for their views on how the government should address tax complexity. Finally, we ask for their opinions on the trends in tax complexity over time and its relationship with administrative and compliance costs, cross-border economic activities, and digital business models. Respondents could choose from predefined responses or provide their insights also in a free-entry text box.

The final part of the survey collects demographic details of the stakeholders involved. In addition to standard demographic information such as position, gender, age, years of experience, and educational

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[6] The Minister of Finance of the Republic of Indonesia obliges the foreign individuals and businesses to have a tax identification number. https://money.kompas.com/read/2019/04/05/134240026/sri-mulyani-wajibkan-wna-dan-badan-usaha-asing-punya-npwp

background, we also ask participants to specify the tax offices to which they are assigned. These tax offices were categorized as small, medium, special, or large, reflecting both the scale of taxpayers handled and the level of oversight exercised by the tax authority. Additionally, we inquired about the primary roles and responsibilities of these tax officers, including functions such as revenue collection, taxpayer assistance, dispute resolution, and formulation of tax regulation.

We distributed the survey in both English and Indonesian language.[7] The inclusion of an Indonesian translation served multiple purposes, including increasing participation rates, and ensuring that all stakeholders could fully comprehend the survey questions. This decision was made also in response to the request of our survey distribution channel, the DGT, for reasons of utmost caution. To ensure the accuracy of the translation we double-checked the translation by an expert in taxation with command of English and Indonesian. For the clarity of the translation, we conducted a formal pretest involving 15 participants, including taxpayers, tax officers, tax academics, and tax consultants.

We distribute the survey to tax officers and corporate taxpayers[8] with the assistance of the Indonesian tax authority, the DGT, and a tax application service provider. Our primary distribution channel is the DGT Echelon II units.[9] We ask permission to conduct a survey from 41 Echelon II units.[10] After receiving approval from 27 units, we request the heads of participating offices to distribute the survey link to tax officers under their supervision and corporate taxpayers under their administration. We do not interfere in the selection of respondents. Additionally, as a secondary channel, we ask for the assistance of an ASP to additionally reach out to corporate taxpayers.

Our survey distribution network encompasses six directorates at the DGT head office and 21 regional offices spanning across Indonesia.[11] Among the 21 regional offices, two hold special designations as "large or special" units. These offices administer the largest and special category

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[7] The translation of the survey is provided by Fernando Siahaan and reviewed by Maria Tambunan (tax expert from the Faculty of Administrative Science from the University of Indonesia).

[8] Corporate taxpayers are represented either by the owner or by the designated employee in charge for responsible for corporate taxation.

[9] Echelon II units refers to the direct unit under the Director of DGT. The DGT is the Echelon I unit of Ministry of Finance. The DGT comprises 50 Echelon II units, including one secretariat, 14 directorates, and 34 regional offices and one technical unit.

[10] We exclude nine units which are less involved in the core of tax administration, such as those dealing with the secretariate, information technology, data and information, document, and internal compliance.

[11] The directorates constitute the core strategic units within the tax head office, bearing responsibility for the specific strategic functions of tax administration at the national level. Regional offices function as operational units with the primary role of coordinating tax administration within tax offices.

taxpayers including the largest corporations both domestic and multinational from various industries and legal forms including foreign investments, permanent establishments, and the oil and gas sector, covering the entire country geography. The remaining 19 regional offices are responsible for managing medium and small taxpayers based on their geographical locations. A comprehensive overview of our distribution channels is presented in Appendix 3 and 4, which provide a detailed list and geographical coverage of these channels.

We collect initial responses from 1,127 individuals, including 914 tax officers and 213 taxpayers. We employ quality checks leading to several steps of sample selection, as presented in Table 1. We exclude 601 (53.3%) responses with less than 50% completed answers to ensure a sufficient coverage of answers to questions that are also included in the survey instrument of the Tax Complexity Index to enable us to conduct respective comparative analyses. We then eliminate 12 (1.1%) responses with extremely short completion times, specifically those under five minutes because against the background of an average time of completion of 33 minutes in our pretests, this duration casts doubts about the quality of the answers. To mitigate concerns of low engagement we deleted these responses. To uphold the integrity of our data, our survey system restricts submissions to one response only per electronic device. Further, we exclude 38 (3.3%) responses that took excessively long to complete, namely those exceeding three hours to ensure each response came from a single respondent.[12] After applying these criteria, our final dataset comprises responses from 391 (82.1%) tax officers and 85 (17.9%) taxpayers.

[Insert Table 1 about here]

Detailed demographic characteristics of these respondents are displayed in Table 2. Table 2 Panel A focuses on general demographics, revealing that 78.0% of tax officer respondents and 32.9% of taxpayer respondents possess over ten years of work experience. Regarding educational qualifications, 39.1% of tax officers and 20% of taxpayer respondents hold at least a master's degree. Additionally, 54.2% of tax officers and 55% of taxpayer respondents have backgrounds in fiscal policy, law, or business administration. In terms of gender distribution, 70.3% of tax officer respondents and 50.6% of taxpayer respondents are male, while 20.7% and 41.2% are female, respectively.

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[12] For robustness we reconducted our analyses for a sample that includes these answers that need very long time to answer. We decided to conduct this robustness check because participants could have been interrupted in completing the survey and continued later. The results are robust in the expanded sample and values only change on the second or third digit after the decimal point.

[Insert Table 2 about here]

Table 2 Panel B presents specific demographic characteristics related to tax administration. A significant proportion of respondents (34.2%) occupy echelon level or managerial level positions. The primary responsibilities of these tax officers include tax revenue collection (40.1%), resolving tax disputes (13.3%), and delivering taxpayer services (13.3%). Regarding office types, 11.3% of respondents are from front offices serving large/special taxpayers, 3.6% from medium, and 44.8% from small taxpayer tax offices; the rest are from back offices, including regional offices (23.5%) and the head office (8.4%), among others.

Finally, Table 3 Panel C displays specific demographics of taxpayer respondents. These include their position such as directors, partners, or principals (11.9%), managers or senior staff (42.4%), assistants or junior staff (32.9%), and others. In terms of their tax office administration, 18.8% are associated with large/special taxpayers, 28.2% with medium, and 48.2% with small taxpayers. Overall, our survey encompasses a wide range of demographic characteristics with overall very qualified respondents.

## 5  Analyses

To measure complexity on the basis of the responses, we apply the approach developed by Hoppe et al. (2023). They describe tax complexity to arise from two major facets of the tax system: tax code complexity, the complexity that arises from the regulations of the tax code and tax framework complexity, the complexity that arises from the legislative and administrative processes and features within a tax system. To capture these facets of complexity we deduce complexity levels for each regulation and procedure based in the results of our survey. In the regulations part, we ask participants to indicate the complexity of the regulations regarding the complexity drivers: ambiguity and interpretation, change, computation, detail, and record keeping on five-point-likert-scales.

To aggregate the single responses to average values, we transfer the answers on the likert scales to numerical values (no extent = 0, little extent = 0.25, some extent = 0.5, great extent = 0.75, very great extent = 1) and aggregate them to unweighted mean values for the (sub)samples. This leads to one single complexity value for each regulation as an unweighted average of the single responses by the five

complexity drivers. In the procedures part, we apply a mixture between likert-scales and yes/no answers. The likert scales are coded the same as in the regulations part (no extent = 0, little extent = 0.25, some extent = 0.5, great extent = 0.75, very great extent = 1). For the yes/no answers, we apply a counting mechanism (no = 0, yes = 1). This means, the more facets of the tax procedures are perceived as being complex, the higher the complexity value for the procedure.

Afterwards we aggregate the single answers to unweighted average values for the procedures tax guidance, tax law enactment, tax filing & payment, tax audits, & tax appeals. In the general perception and perspectives on tax complexity part, we apply the same mixed scaling approach. Tax code complexity can then be compiled as an aggregate of the values of each regulation. Tax framework complexity is an aggregate of the aggregated values for legislative procedures, guidance, payment and filing, audits, and appeals. We refrain from Hoppe et al. (2023) by not weighting the regulations based on self-assessed averages of the level of the importance of the specific drivers or dimensions of the respondents. This seems appropriate for the purpose of this study as this is a single country study and the importance of the regulations should be equal across participants. Accordingly, for tax framework complexity, weights are evenly distributed among the various drivers and dimensions.[13]

In the first part of our analysis, we explore the peculiarities of the complexity of the Indonesian tax system by investigating the complexity in regulations and procedures from the perspective of the Indonesian tax administration. We provide an overview of the general complexity perceptions of tax officers in Indonesia, detect advantages and disadvantages of complex tax systems and provide possible strategies to address tax complexity as perceived by the participants from the Indonesian tax authority. Additionally, we present descriptive results of the complexity of the investigated regulations and procedures. To gain insights into the mechanics of the complexity of the Indonesian tax system, we derive insight into the drivers of the most complex regulations and procedures and therefore provide a better understanding of potential reasons for extensively complex areas in the Indonesian tax system.

In the second part of the analysis, we conduct comparative analyses of different groups to detect possible differences in the perception on complexity regarding the different angles of the groups. First, we compare the perceptions of tax officers with those of corporate taxpayers. In an additional survey,

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[13] See Hoppe et al. (2023) pp. 248-252.

we gathered data from Indonesian corporate taxpayers from all sizes and compare them to our findings from the tax administration side. This is particularly important for getting a better understanding of the complexity of the tax system, since different stakeholders may differ in their perceptions and therefore are differently impacted by this perception (Blaufus et al. (2022)). These differing perceptions, if not considered, may lead to suboptimal decisions in the urge to mitigate excessive complexity.

Second, we perform sample splits concerning tax officers' primary focus in their daily tasks: revenue collection and dispute resolution. For developing countries, collecting tax revenue is particularly crucial to address emerging legislative, fiscal, and administrative challenges. Tax complexity exacerbates noncompliance, thereby posing potential harm to revenue collection and increasing the number of disputes due to noncompliance (Milliron (1985), Borrego, Lopes, and Ferreira (2016), Blesse (2021)). By identifying overly complex areas in the tax system from the viewpoint of these tax officers, we can help to possibly diminish harmful complexity.

Third, we split our sample of tax officers depending on the size of the corporate taxpayers they are working with. Corporate taxpayers of different sizes encounter varying levels of exposure to specific regulations and procedures and possess differing capacities (Engelschalk (2007)). Since complexity may be prone to be influenced by multinational aspects, such as anti-tax avoidance regulations for multinational corporations, little is known about the peculiarities of the complexity of national operating companies. We split our sample to investigate the company-size-dependent peculiarities of tax complexity.

## 6   Main Results

### 6.1   Overview of Tax Complexity in Indonesia

To assess how respondents perceive tax complexity in Indonesia, including its costs, benefits, and potential solutions we ask them about five statements regarding tax complexity on a five-point Likert scale. The results are presented in Figure 1. 67.91% of the participants report that tax complexity has increased in the last five years (Panel A). Moreover, 64.46% (66.58%) of the respondents expect tax complexity-induced additional tax administration (tax compliance) efforts in the future. More than three fourth (78.78%) of the respondents' report growing cross-border activities and 72.42% growing digital

business models being the main drivers of this increase in tax complexity. Overall, these results show that tax complexity is a serious issue for the respondents inhibiting negative externalities.

[Insert Figure 1 about here]

Next, we find mixed results on the potential costs and benefits of tax complexity as shown in Panel B of Figure 1. While 36.8% (29.9%) of respondents perceive enhanced payment (administrative compliance due) to tax complexity, a similar proportion believe it leads to a decline in payment (35.3%) and administrative (34.8%) compliance. A high share of 44.5% (35%) of all responding tax officers expects more tax disputes (tax risk), while only 19.4% (20.7%) expect fewer disputes (less risk). At the same time only 18.7% of the tax officers perceive an increase in tax administration costs. Apparently, tax disputes and tax risk are seen as the most critical negative concerns. Nevertheless, participants do not expect the tax administration costs to increase accordingly. This leads to the conclusion that complexity induced disputes are not necessarily costly for administrations and could potentially be cost decreasing, e.g., through prevented tax evasion due to the disputes.

Finally, we ask about measures to mitigate the excessive impact of tax complexity and present the result in Panel C of Figure 1. 72.1% of participants indicate that the government should improve the use of information technology to fight tax complexity. More than half of the surveyed tax officers (55.5%) state that principle-based instead of rule-based regulation can help to mitigate tax complexity. Moreover, 54.7% believe cooperation between tax authorities and taxpayers, e.g., in the form of cooperative compliance, is a useful tool to decrease undesired tax complexity. Taken together, the results indicate ample room for improvement.

The investigation of the general perception of tax complexity shows that complexity in Indonesia increased in the recent past and is expected to be further increased by digitalized and globalized businesses. However, there are strategies to address these trends, e.g., through the optimization of information technology.

## 6.2 Most Complex Tax Regulations

We present descriptive statistics in Table 3 for tax officers' (82.1% of our sample) perception of tax complexity. More details are reported in Appendix 6. Panel A of Table 3 presents the perceived level

of tax code complexity. The results show that the tax code complexity average is 0.733, ranging from 0.695 to 0.787 among regulations.

[Insert Table 3 about here]

In comparison the most recent values for the world average in the Tax Complexity Index in 2022, all regulations are perceived as very complex in our study. The world average of the Tax Complexity Index in 2022 for all regulations (unweighted Tax Code Complexity Subindex) is 0.417 and therefore substantially lower. The average unweighted Tax Code Complexity Subindex for Indonesia is above the global average (0.511). Nevertheless, it reflects substantially lower absolute values compared to our results. Taking only developing countries into account,[14] the unweighted Tax Code Complexity Subindex of the Tax Complexity Index displays a value of 0.426 and is, correspondingly, substantially lower than the value in this study. These results might reflect that tax officers in Indonesia perceive tax regulations as very complex overall and even more complex than in other developing countries.

The most complex regulations in Indonesia encompass transfer pricing (0.787), statutory tax rates (0.754), and dividends (0.738).[15] While transfer pricing is the most complex regulation consistent with the global evidence, the high complexity of statutory tax rates and dividends in Indonesia may come as a surprise. On average, statutory tax rates rank much lower worldwide, namely in the third quartile. Also, dividends rank lower in the world average in the second quartile.

The drivers of the complexity of transfer pricing in Indonesia are record keeping (0.808) and ambiguity & interpretation (0.801)[16] (see Figure 2, Panel A). This complexity arguably increased by enhanced transfer pricing documentation requirements following the BEPS Action 13 implementation

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[14] We qualify countries as developing countries based on the definition of the International Monetary Fund (IMF) as per the latest classification in April 2023 (https://www.imf.org/en/Publications/WEO/weo-database/2023/April/groups-and-aggregates). The developing countries included are Armenia, Brazil, Bulgaria, Chile, China, Colombia, Costa Rica, Hungary, India, Indonesia, Kazakhstan, Kenya, Malaysia, Mexico, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, South Africa, Thailand, Türkiye, Ukraine, Urugay, and Vietnam.

[15] While transfer pricing and statutory tax rates are considerably more complex than the next complex regulation (dividends), we have to note that dividends is the most complex regulation of the next-tier cluster of regulations that all are rather similar in that respect, but lower in complexity than transfer pricing and statutory tax rate regulations. For brevity of our analysis, we focus on the top quintile of tax regulations (transfer pricing, statutory tax rates, dividend taxation) and thus abstain from discussing the other regulations of this next-tier cluster.

[16] See Appendix 3 for a detailed description of the drivers of the complexity of the captured regulations.

(2016).[17] Additionally, the extensiveness of these regulations often complicates interpretation, especially given tax officers' limited expertise in sophisticated related-party transactions.

[Insert Figure 2 about here]

For the second most complex regulation, statutory tax rate, the complexity is primarily stemming from the intricacies in computation (0.769) and the details (0.760) (Figure 2 Panel B). Surprisingly, in the 2022 wave of the MNC Tax Complexity Survey (Hoppe et al. (2023)) statutory tax rates is perceived as moderately complex in Indonesia (Rank 8 of 15), as well as in other developing countries (Rank 11 of 15).

Indonesian firms face two corporate income taxation regimes: a turnover-based corporate income tax for SMEs and selected industries, and a traditional corporate income tax for all other firms.[18] Notably, the turnover-based corporate income tax rates vary significantly across and within industries.[19] Also, the traditional corporate income tax rates differ depending on total turnover and corporate type. The rates are discounted by 50% for incomes below a certain threshold[20] and are three percentage points lower for public corporations.[21] Furthermore, recent government amendments have modified the rates, further contributing to the perceived complexity in this regulation. In 2020, the government adjusted the rates from 25% to 22% for 2020 and 2021, and then to 20% thereafter,[22] only to be amended again in 2021 to 22% for 2022 and thereafter.[23] This diverse tax rates for different taxpayers and the frequent changes provide an explanation for the considerable tax rate complexity.

Dividend taxation ranks as the third most complex tax regulation, primarily driven by ambiguity and unclear interpretations (0.752) and by record-keeping (0.743) (Figure 2 Panel C). As there is a principle-based definition of dividends in Indonesia hidden dividend payments may trigger dividend

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[17] Regulation of the Minister of Finance of the Republic of Indonesia number 213/PMK.03/2016 concerning The Types of Documents and/or Additional Information that must be Retained by Taxpayers who Conduct Transactions with a Related Party, and the Procedures.

[18] For additional insights into the implications of turnover-based corporate income taxation, refer to Amberger, Siahaan, et al. (2023).

[19] Article 4(1) of the Income Tax Law.

[20] Article 31E of the Income Tax Law.

[21] Article 17(2) of the Income Tax Law.

[22] Law Number 2 of 2020 on Enactment of the Government Regulation in Lieu of Law Number 1 of 2020 on State Financial Policy and Financial System Stability for the Handling of the Corona Virus Disease 2019 (COVID-19) Pandemic and/or In the Context of Facing Threats Endangering National Economy and/or Financial System Stability into Law

[23] Law Number 7 of 2021 on Tax Regulation Harmonization

taxes.[24] Furthermore, dividend regulation includes tax exemptions that have the potential to reduce tax complexity; however, these exemptions are subject to very stringent conditions.[25] Significant changes have been made to these exemptions, since 2020 all broadening the scope of the exemption but at the same time complicating the exemption criteria.[26] Furthermore, the government also defines types of non-dividend income to be considered as deemed dividends to prevent tax avoidance.[27] Finally, complexity in administering withholding taxes on dividends further elevates the perceived complexity.

Panel B of Table 3 shows the drivers of the complexity of all regulations. Record keeping is the most important driver of the complexity of Indonesian tax regulations. Ambiguity and interpretation, computation, and the details of regulations are of nearly similar importance, while change is the least important driver of tax complexity in Indonesia. Nevertheless, the absolute values reach relatively high levels for each driver in the survey. Moreover, all drivers are highly correlated (see Appendix 6 Panel B). and therefore, each driver seems to have a significant impact on the complexity of the regulations. None of the drivers stand out as the major reason for complexity. This underlines the multidimensional nature of complexity and points towards an in-depth analysis of the complexity of certain regulations to understand the mechanics behind the complexity of a specific regulation.

We identify the regulations regarding transfer pricing, statutory tax rates and dividends to be the most complex regulation in our survey. Since transfer pricing and dividend taxation regulation are known to be comparatively complex,[28] statutory tax rates mostly do not rank under the most complex regulations. We find that the computation and the details of these regulations are the main drivers of complexity. These finding may refer to the recent government amendments have modified the statutory tax rates in Indonesia and may have led to unintended consequences in the form of excessive complexity.

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[24] Article 4(1) of the Income Tax Law stipulates the broad definition of dividend
[25] Article 4(3) of the Income Tax Law stipulates the specific criteria of the exemption of the dividend
[26] For example, to be exempted for income tax the dividend should be invested in specifics minimum amount, specific sectors within specific periods. There also different criteria for dividend from listed (in stock exchange) and non-listed company.
[27] Ministry of Finance Regulation number 107/PMK.03/2017 concerning the Determination of the Time of Dividend Acquisition and Its Calculation Basis by Domestic Taxpayers for Capital Participation in Foreign Business Entities Other Than Business Entities Selling Their Shares on the Stock Exchange.
[28] See taxcomplexity.org.

### 6.3 Most Complex Tax Procedures

Panel A in Table 4 presents the perceived levels of tax complexity in tax procedures. Our findings reveal an average framework complexity of 0.286, ranging from 0.251 to 0.372. This value is in line with the world average of the tax framework complexity documented in the for 2022 (0.284). Noticeably, according to the tax complexity index of 2022 and thus from the perspective of tax experts in tax advisory firms, Indonesia has a framework complexity of 0.327 similar to the average of all developing countries (0.333) in the index, higher than the average of developed countries.

Further, we find tax law enactment (0.372) and tax appeals (0.234) emerge as among the most complex procedures perceived by Indonesian tax officers, while tax audits are perceived as the least complex (0.251). These results deviate from the world average, where tax law enactment and tax appeals are regarded as moderately complex. These results point toward the different roles of tax officers in tax law enactment and tax appeals as compared to tax professionals.

[Insert Table 4 about here]

In detail, our survey indicates that tax law enactment is exceptionally complex. This high level of complexity seems to primarily arise from the considerable influence of third parties, with a complexity score of 0.570 (Figure 3). In many developing countries, the process of enacting tax laws often is not transparent in its structure and process. This may not allow tax officers to provide input but, at the same time, might open room for the influence of self-interested (lobbying) groups. This lack of participation of tax officers in legislative procedures might lead to regulations that do not adequately reflect issues of practical relevance for tax administrations. Additionally, the power of third parties, like lobbying groups, introduces further complications, potentially skewing legislation towards specific interests rather than being perceived as serving the broader public interest. The time between the announcement of tax changes and their enactment (0.368), the time at which tax legislation becomes effective (0.358), and the quality of the tax legislation draft (0.340) also add to the above-average value of the complexity of the tax law enactment process. These findings point towards time-consuming and inefficient processes in the Indonesian enactment process.

[Insert Figure 3 about here]

Further, our survey evidence indicates that tax appeals represent a significant complexity, ranking as the second most complex tax procedure. In Indonesia, tax appeal procedure comprises two sequential stages: objections handled by the tax administration and appeals processed by the tax court. Both stages are included in our survey. The primary complexity drivers in tax appeals are inconsistent decisions in tax appeals (0.427) and the influence of third parties in these processes (0.348) and unpredictable completion time in tax appeals (Figure 3 Panel B). Interestingly, these high complexity factors are predominantly associated with the appeals stage, particularly involving the tax court, highlighting challenges in the dispute resolution system outside the tax administration. In the tax objection process, inconsistent decisions are the most crucial complexity driver.

Panel B of Table 4 shows the correlation coefficients between the investigated tax procedures. The complexity of the procedure of tax law enactment is significantly positively correlated with tax filing and payment and tax audits. All other correlations are statistically insignificant or low.

In this chapter, we provided insides into the complexity of tax procedures as perceived by Indonesian tax officers. We identified the processes tax law enactment and tax appeals and objections to be the most complex procedures. Moreover, we show that the influence of third parties is the biggest complexity driver in the enactment process. In the appeals and objections procedure, inconsistent decisions are the most serious driver of complexity.

## 7  Comparative Analyses

### 7.1 Tax Officers vs. Taxpayers

To put our findings into perspective and elucidate the heterogeneity across stakeholders we compare the perceived levels of tax complexity of our two distinct respondent groups, tax officers and taxpayers (Table 5).

[Insert Table 5 about here]

We find a notable variance in the perception of tax code complexity. We find that tax officers report a significantly higher complexity level (0.734) compared to taxpayers (0.678). Conversely, in the domain of tax procedures, taxpayers perceive a significantly higher level of complexity (0.406) than tax officers do (0.300). These findings highlight the disparity in perceptions.

We examine these contrasting views and sensitivities to tax complexity between the two groups for the various tax regulations (Panel A Table 5). We observe a consistent trend: tax officers generally perceive higher levels of tax complexity across most regulations compared to taxpayers, with only statutory tax rates and investment incentives being very similarly assessed by both groups. Both groups report transfer pricing and statutory tax rates as the most complex regulations. However, opinions diverge for the third most complex regulation. Tax officers rate dividend taxation as more complex, whereas taxpayers perceive the loss-offset provisions to be more complex. We find that both groups rank record keeping as the most important driver of the complexity of transfer pricing regulation. Interestingly, ambiguity and interpretation of transfer pricing regulations ranks second in the tax officers' group but only fourth in the taxpayers' group after record keeping, computation, and detail. Both groups agree in the fact that complexity due to changes in transfer pricing regulations are of comparatively minor importance. We find all differences in the values of the drivers by the two groups are statistically significant.

Overall, these results suggest that despite variations in perceived levels of complexity, there exists a notable consensus regarding the ranking of the complexity in regulations. Tax officers and taxpayers agree that transfer pricing and statutory tax rates are marked with particularly high levels of complexity but perceive the complexity of regulations regarding loss offset and dividend taxation different.

We provide a comparison for the perceived complexity in tax procedures in Panel B of Table 5. We find that tax officers tend to perceive the procedures as less complex relative to taxpayers in all procedures. However, the two groups differ significantly in what they consider most complex. As discussed earlier, tax officers rank tax law enactment as the most complex procedure. By contrast, taxpayers perceive tax guidance as the most complex procedure and rank tax law enactment fourth. We find the largest difference in value (statistically significant) and in ranks for tax audits. Taxpayers rank tax audits second, tax officers rank tax audits as the least complex regulation. This is interesting because tax audits are a procedure in which tax officers and taxpayers meet in the process. Possibly tax officers feel that they have command of the tax audit, which leads to moderate complexity. Taxpayers might not feel alike and particularly might fear the complexity of tax audits because they the lack of comprehensive and easily applicable tax guidance does not allow them to be confident that they managed to comply

with all regulations. To understand tax audit complexity even better, we take a closer look into the reasons for this differing perception (Figure 4).

[Insert Figure 4 about here]

Taxpayers are concerned about the insufficient disclosure of selection criteria before a tax audit, inconsistent decisions by tax officers, the lack of additional guidance and bad communication on audit topics as the most important complexity drivers with respect to tax audits. These aspects indicate a lack of trust and deficiencies in communication between tax officers and taxpayers and point toward a demand for efficient and cooperative tax procedures. This not only seems to be the taxpayers view but also tax officers confirm this view.

## 7.2 Revenue Collection vs. Dispute Resolution

The literature provides evidence that tax complexity is a threat to the economy and fosters non-compliance (Milliron (1985); Borrego, Lopes, and Ferreira (2016); Blesse (2021)). Therefore, it is of particular importance to investigate the perceived complexity of tax officers in the revenue collection unit. Moreover, through increased tax planning opportunities due to tax complexity, disputes are likely to increase, too. Therefore, we investigate the perceptions of tax complexity of employees in dispute resolution.

We compare the answers of the tax officers of both groups, specifically their answers on the perceptions of regulations of transfer pricing, statutory tax rates, and permanent establishments, thus, those regulations that are perceived as most complex in both groups and reveal the biggest differences in complexity perception between both groups. We scrutinize the drivers of the complexity of these regulations to investigate the driving forces of complexity perceptions.

Our results reveal there is no significant differences in the complexity in each tax regulation, except in permanent establishment (Table 6 Panel A). Regulations on permanent establishments are perceived as significantly more complex in the group of tax officers in dispute resolution, this perception is most pronounced in the dispute resolution group and only of minor importance in the revenue collection group. The pronounced role of the complexity of regulations on permanent establishments for dispute resolution is consistent with global evidence and concerns in public discussions (Olbert and

Spengel (2019)). This finding is important because tax complexity may result in tax disputes (Lindsey, McDonnell, and Moser (2023)) and ultimately hinder economic growth (OECD (2018), OECD (2019), Fox et al. (2022)) and investment (De Waegenaere, Sansing, and Wielhouwer (2007), Becker, Davies, and Jakobs (2017), Diller et al. (2017)).

Regarding the complexity of the tax framework, both groups perceived similar levels of complexity across all procedures, with the exception of tax guidance (Table 6 Panel B). Tax officers in the dispute resolution seem to be more exposed to complexity in the tax guidance procedure. This leads to the conclusion that guidance for dispute resolution has to be clearer in its formulation and application. This is of particular importance because disputes are perceived to be increased via complexity (Figure 1, Panel B).

Consistently and again, the most complex regulation in both groups is transfer pricing. The second most complex regulation is statutory tax rates in the revenue collection subsample, but it only ranks seventh in the dispute resolution subsample. This finding reflects that, in the revenue collection process, statutory tax rates are crucial and so is its complexity.

To investigate the differences in complexity perceptions in the two groups, we investigate the complexity drivers of the regulations of transfer pricing, statutory tax rates, and permanent establishment (Table 6 Panel C). Record keeping emerges as a crucial driver of tax complexity of transfer pricing in both groups. It ranks first in the revenue collection and second in the dispute resolution subsample. Ambiguity and interpretation in transfer pricing regulations is more pronounced in the dispute resolution subsample.

[Insert Table 6 about here]

The high detail of statutory tax rates is a serious issue for both groups. Additionally, the computation of statutory tax rates and the ambiguity and interpretation of the tax rates are serious complexity drivers for them. This is not surprising because, besides the two different corporate income tax regimes (turnover-based corporate income taxation for SMEs and selected industries and traditional corporate income taxation), statutory tax rates have been subject to frequent changes in the recent past (see section V.2.1).

The complexity of regulations regarding permanent establishments is mainly driven by the ambiguity and interpretation in the dispute resolution subgroup. Record keeping is the main driver in the revenue collection subgroup. Ambiguity and interpretation only rank fourth in the revenue collection subgroup. This points to complexity for dispute resolution primarily is due to the complexity in documentation and the arising potential misleading or misinterpreted disclosed information.

When asked about the potential disadvantages of overall tax complexity, participants in the dispute resolution subgroup perceive more disputes in the taxation process due to tax complexity as a serious concern. They are also more concerned about tax complexity than other respondents in the sample (Figure 5) and more in favor of cooperation between tax authorities and taxpayers to fight tax complexity. This, again, signals that cooperation between taxpayers and tax administrations can be a useful tool to handle and decrease undesired tax complexity.

[Insert Figure 5 about here]

### 7.3 Taxpayers' Size

We split the sample into groups of tax office with taxpayers of different size. On the one hand, we investigate tax offices for large and medium taxpayers and, on the other hand, we for small taxpayers. Small taxpayers face quite different challenges and opportunities than large and medium taxpayers do (Engelschalk (2007)). Most importantly, small taxpayers are less likely to act in multinational contexts. Therefore, it is of particular importance for governments to understand the perceptions of the tax officers working with small taxpayers to tackle undesired tax complexity for these enterprises. This aspect is of special importance for Indonesia, since more than 99% of the total business population are SMEs (OECD (2022)).

As displayed in Panel A of Table 7, there are no significant differences in the perception of the complexity of tax regulations between the groups of small-taxpayer officers and large/medium-taxpayer officers. Both groups rank transfer pricing regulations as the most complex and statutory tax rate regulations as the second most complex regulations.

[Insert Table 7 about here]

Surprisingly, small-taxpayer officers rank loss offset regulations as the third most complex regulation while large/medium-taxpayer officers only rank these regulations seventh and instead rank dividend regulations third. This is an important finding because there is ample evidence that tax-specific country-level risk in loss offset regulations translates undermines risk-taking an investment (Osswald and Sureth-Sloane (2024)).

Looking at the tax procedures displayed in Panel B, we see that both groups perceive the tax law enactment process as the most complex procedure. Again, we find that only the difference between the two tax officer groups for tax guidance procedure is statistically significant. It ranks fourth in large/medium-taxpayer officers and second in the small-taxpayer officers. This finding suggests that overly complex guidance is seen as particularly complex for small taxpayer officers and might be an obstacle for compliance

Overall, our survey evidence suggests that government should focus on decreasing the complexity in loss offset, and especially in record keeping and computation for this purpose to support small-taxpayer officers.


## 8   Conclusion

We investigate the factors contributing to tax complexity in tax regulations and procedures in Indonesia as a prominent developing country. Utilizing the approach developed by Hoppe et al. (2023) for the Tax Complexity Index, we assess the perceived tax complexity in Indonesia. Our study encompasses a survey customized for Indonesian tax officers and a small sample of Indonesian corporate taxpayers. We identify the crucial determinants of tax complexity in tax regulations and tax procedures and contrast them with global evidence and evidence for developing countries. Additionally, we conduct comparative analyses for different groups of tax officers and taxpayers. Overall, the respondents perceive an increase in tax complexity over the last five years, driven by global factors such as globalization and digitalization, implying additional tax administration and compliance efforts, along with an increase in tax disputes.

Consistent with prior findings (Bornemann et al. (2020); Hoppe et al. (2023)), we find transfer pricing regulations to be the most complex regulation. Surprisingly we find statutory tax rates and the

taxations of dividend payments to rank second and third, highlighting areas of tax complexity that seem to be specific for a developing country. Tax law enactment emerges as the most complex tax procedure with the influence of third parties appearing to be the most important complexity driver in tax law enactment. Tax appeals rank second in tax framework complexity with inconsistent decisions being the main driver of the complexity of tax appeals.

Our comparative analysis across stakeholder clusters reveals both universally and specifically perceived complexities in tax regulations and procedures. Transfer pricing, statutory tax rates, and tax law enactment are widely regarded as highly complex by most stakeholders. However, certain complexities are perceived differently depending on the stakeholder group. For example, dispute resolution officers find permanent establishment rules particularly challenging, while small-taxpayer officers and taxpayers emphasize the complexity of loss offsets and tax guidance.

Our analysis provides helpful insights to help policymakers to develop more effective and better targeted improvements of the tax system of developing countries. However, our study has some limitations. It focuses solely on one developing country, necessitating caution and additional analyses when drawing broader conclusions. Nonetheless, as Indonesia is one of the largest and strongly growing developing economies our study provides a starting point for analyses of tax complexity and its implications for investment and compliance in other developing countries.

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**Figure 1: Overview of Perceived Overall Tax Complexity in Indonesia**

Panel A: Statements regarding Tax Complexity
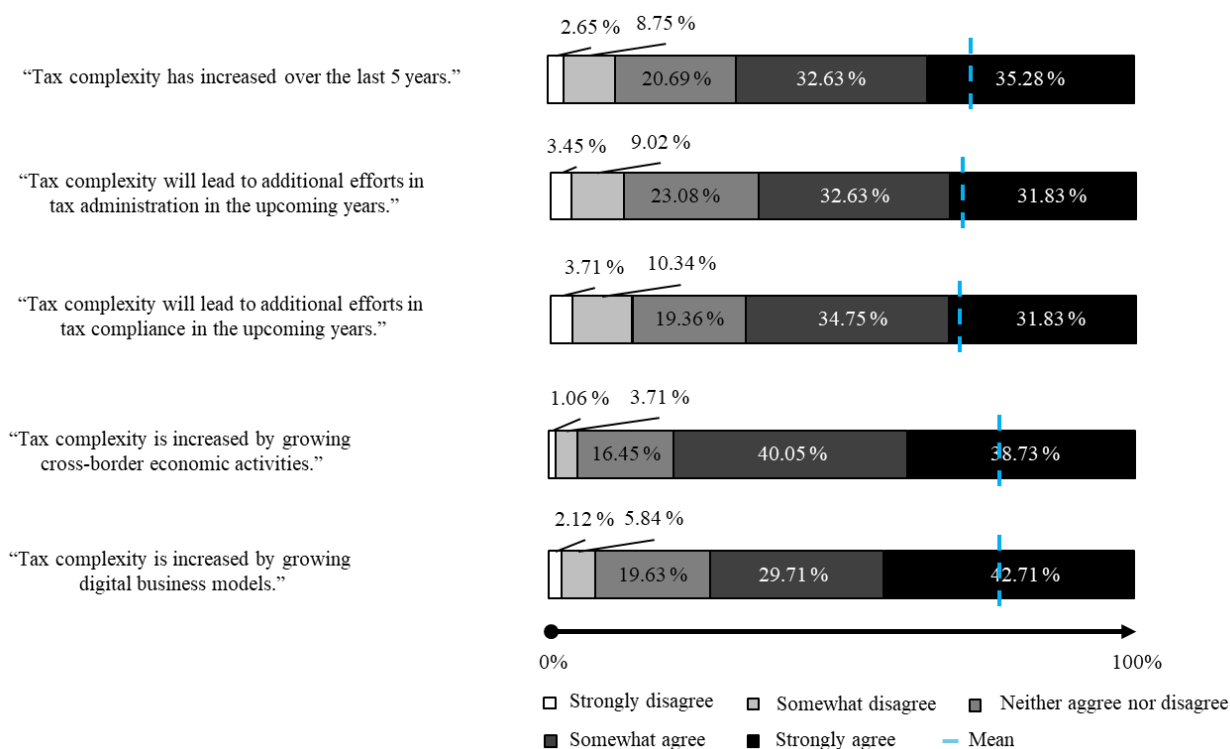


Panel B: Perceived advantage and disadvantage of Tax Complexity
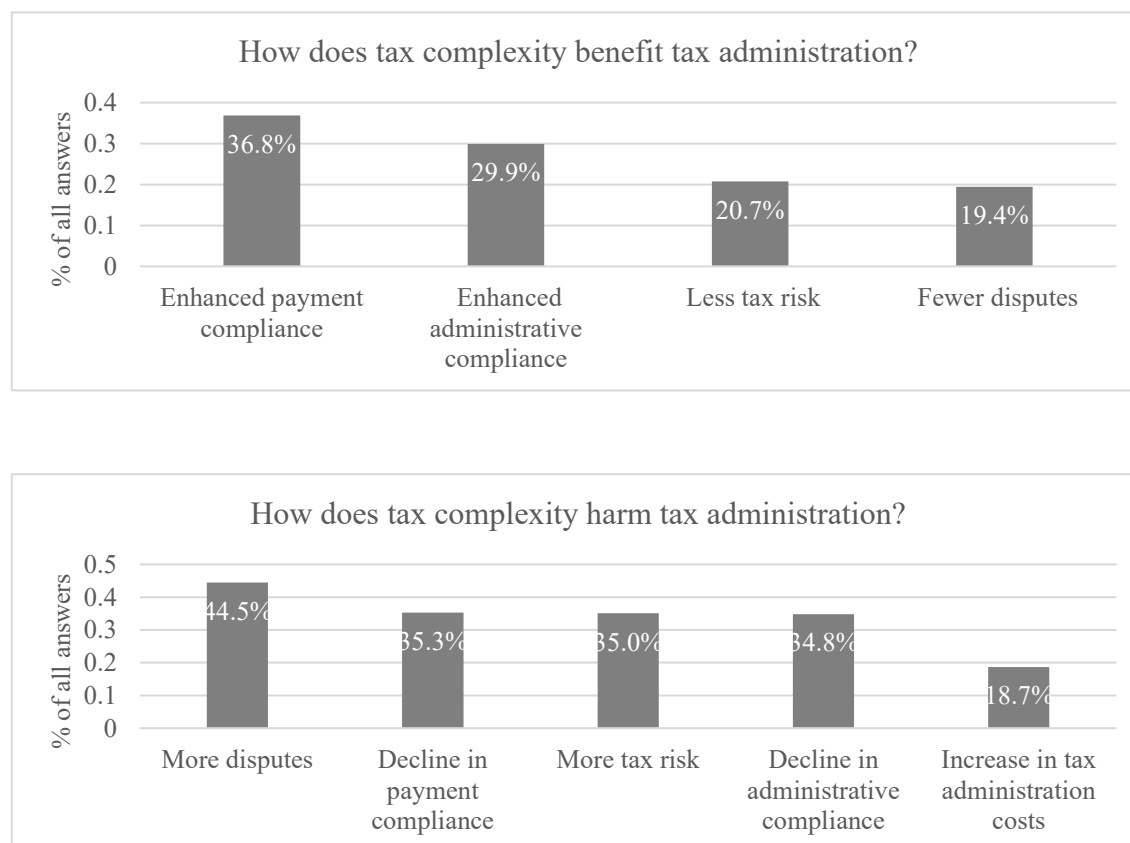
Panel C. Strategies to Address Tax Complexity
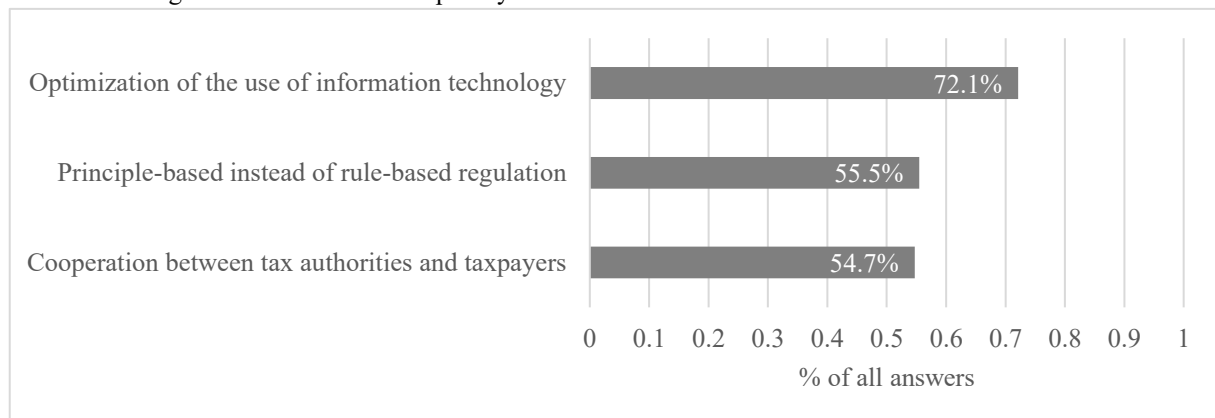


Notes: Notes: The figure visualizes the overview of Indonesian Tax Complexity. Panel A presents the respondents' levels of agreement and disagreement on various statements regarding trends in tax complexity. Panel B presents the perceived advantages and disadvantages of tax complexity as perceived by the respondents. Panel C presents the preferred strategies to address tax complexity.

**Figure 2: Drivers of The Most Complex Regulations**

Panel A: Transfer Pricing
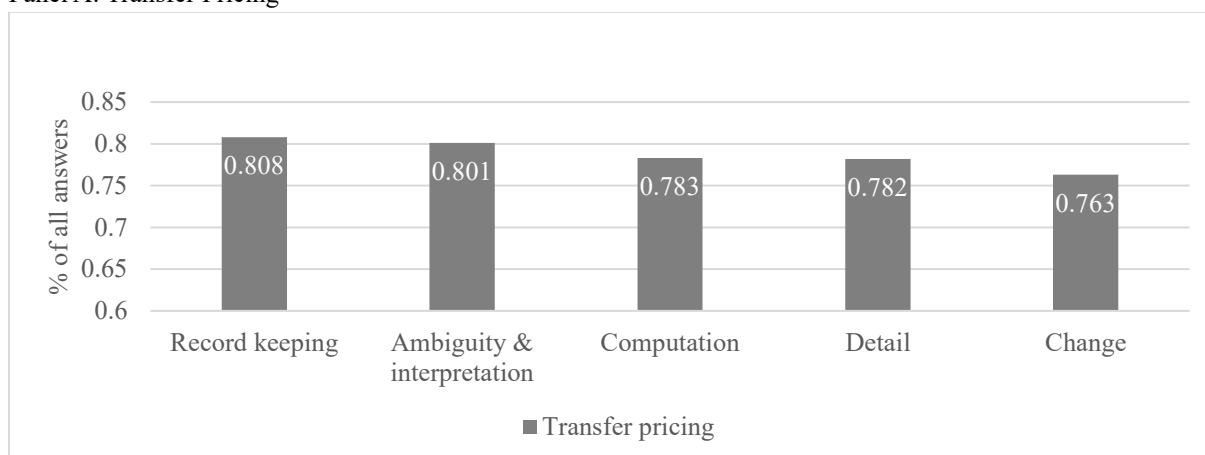


Panel B: Statutory Tax Rate
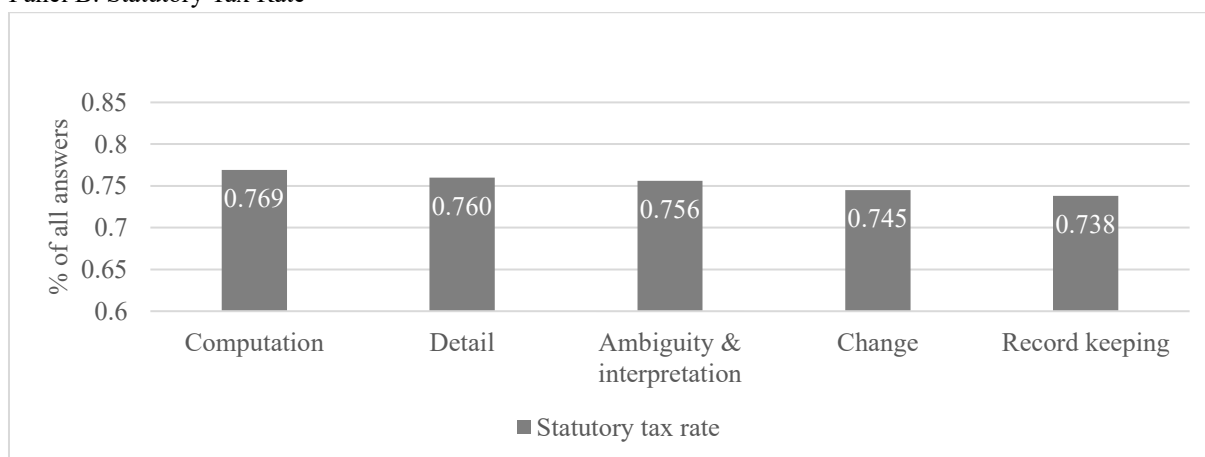


Panel C: Dividends
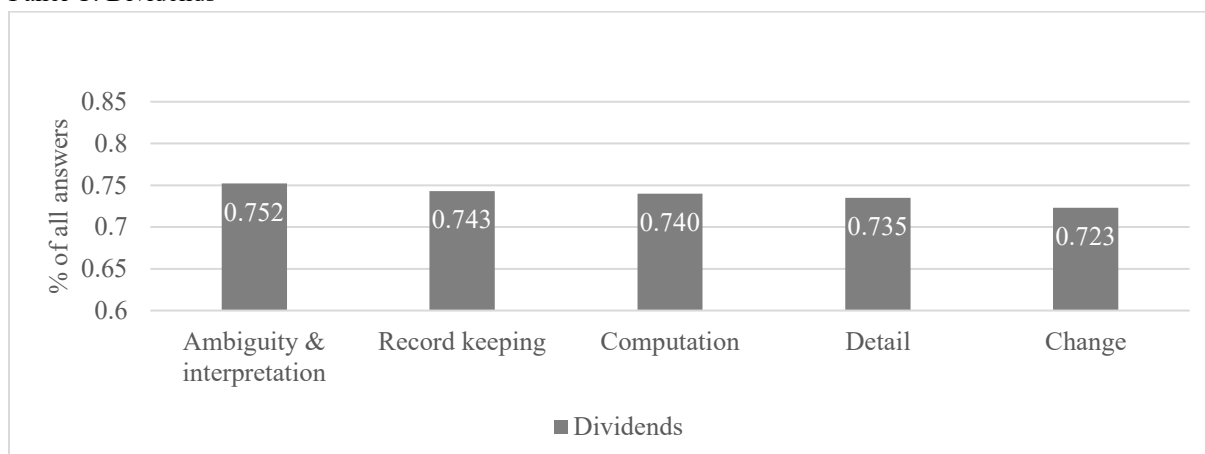


Notes: The figures present the relative importance of the five drivers for the top three most complex regulations: transfer pricing (Panel A), statutory tax rate (Panel B) and dividends (Panel C). The displayed values reflect the average perception of respondents from the Indonesian tax administration. Scaled between 0.6 and 0.85.

**Figure 3: Drivers of The Most Complex Tax Procedures**

Panel A: Tax Law Enactment
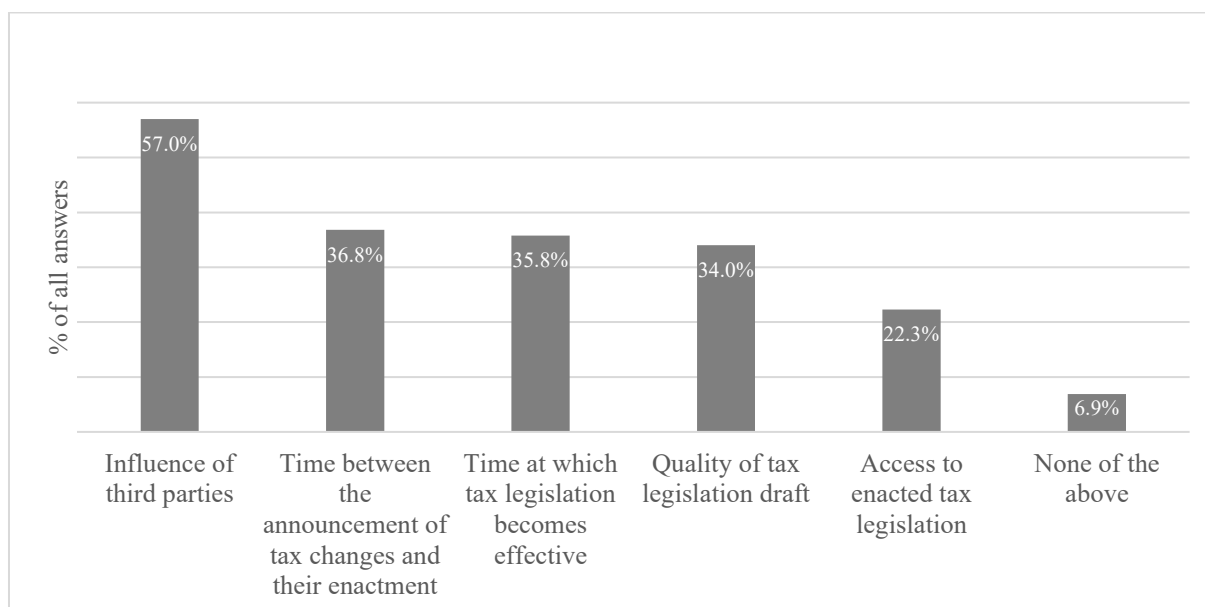


Panel B: Tax Appeals
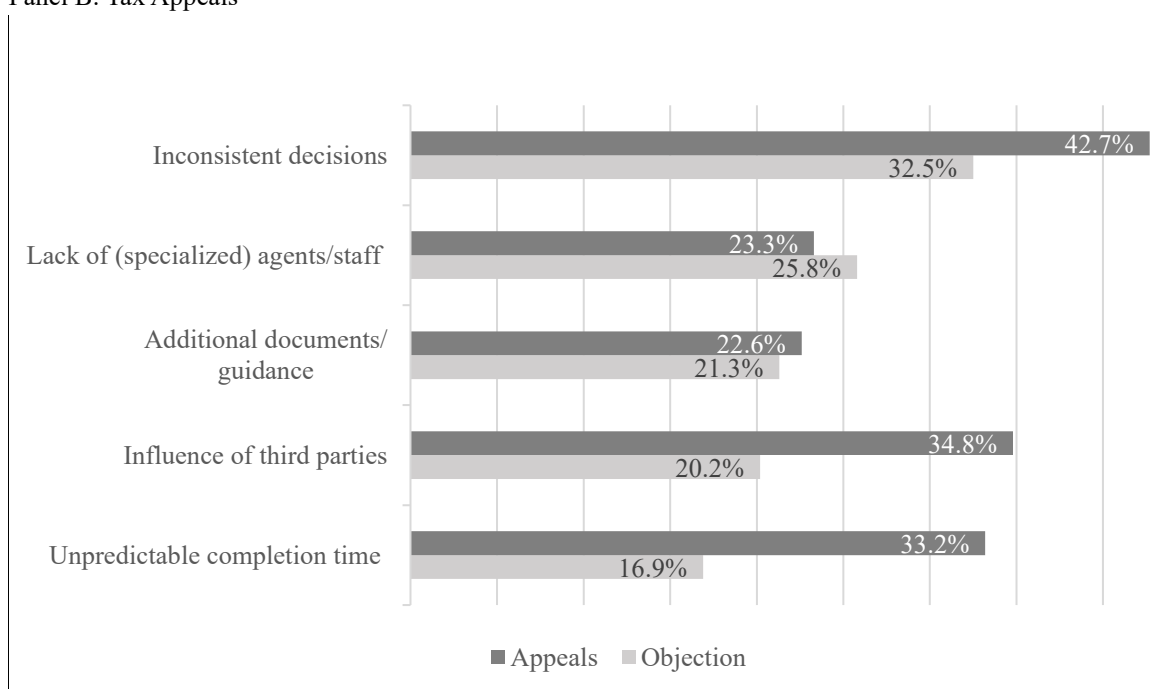


Notes: The figures present the drivers of the most complex procedures. The displayed values reflect the average perception of respondents from the Indonesian tax administration. Panel A presents the drivers for the complexity tax law enactment. Panel B presents the drivers for the tax complexity in tax appeals during the tax appeals process, distinguishing between the objection (administrative) and appeal (litigation) stages.

**Figure 4: Complexity Drivers in the Tax Audit Process**



| | Tax Officers | Taxpayers |
|---|---|---|
| Little or no disclosure of selection criteria for tax audit targets | 30.9% | 64.7% |
| Inconsistent decisions by tax officers | 38.1% | 58.8% |
| Additional documents/guidance | 22.8% | 52.1% |
| Poor or no communication of topics to be covered by the tax audit | 25.3% | 51.8% |
| Lack of experience or technical skill of tax officers | 34.5% | 42.4% |
| Offensive or unethical behavior by tax officers | 15.6% | 32.9% |
| Late or no notification of the upcoming tax audit | 9.7% | 28.2% |
| Absence of a regular tax audit cycle | 27.4% | 21.2% |
| Ineffectiveness of sanctions imposed in case of violations | 21.7% | 18.8% |

■ Tax Officers ■ Taxpayers

Notes: The figure displays the average perceived complexity of different facets of the tax audit process, displayed separately for corporate taxpayers (dark grey) and tax officers (light grey). The different facets are sorted by the taxpayers' values. Scaled between 0 and 0.7.

**Figure 5: Comparative Analysis: Revenue Collection and Dispute Resolution Officers**

Panel A: Comparative Perceived Disadvantages of Tax Complexity



How does tax complexity harm tax administration?

- □ Tax Administration
- ■ Revenue Collection
- ■ Dispute Resolution

| | More disputes | Decline in payment compliance | More tax risk | Decline in administrative compliance | Increase in tax administration costs |
|---|---|---|---|---|---|
| Tax Administration | 44.5% | 35.3% | 35.0% | 34.8% | 18.7% |
| Revenue Collection | 43.9% | 39.5% | 40.8% | 38.2% | 19.1% |
| Dispute Resolution | 65.4% | 25.0% | 26.9% | 25.0% | 23.1% |
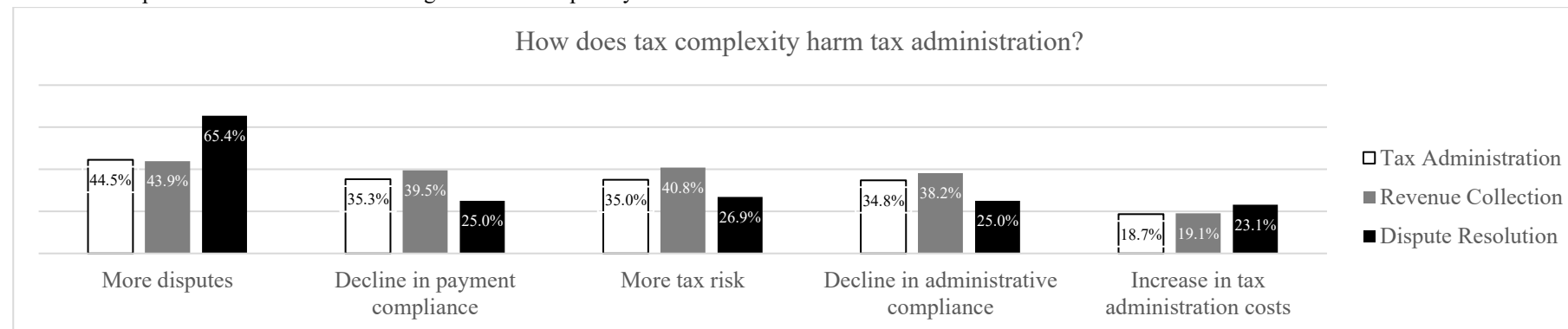
Panel B: Comparative Preferred Strategies to Address Tax Complexity



What should the government do to fight tax complexity?

- □ Tax Administration
- ■ Revenue Collection
- ■ Dispute Resolution

| | Principle-based instead of rule-based regulation | Cooperation between tax authorities and taxpayers | Optimization of the use of information technology |
|---|---|---|---|
| Tax Administration | 55.5% | 54.7% | 72.1% |
| Revenue Collection | 63.7% | 55.4% | 73.2% |
| Dispute Resolution | 57.7% | 63.5% | 78.8% |
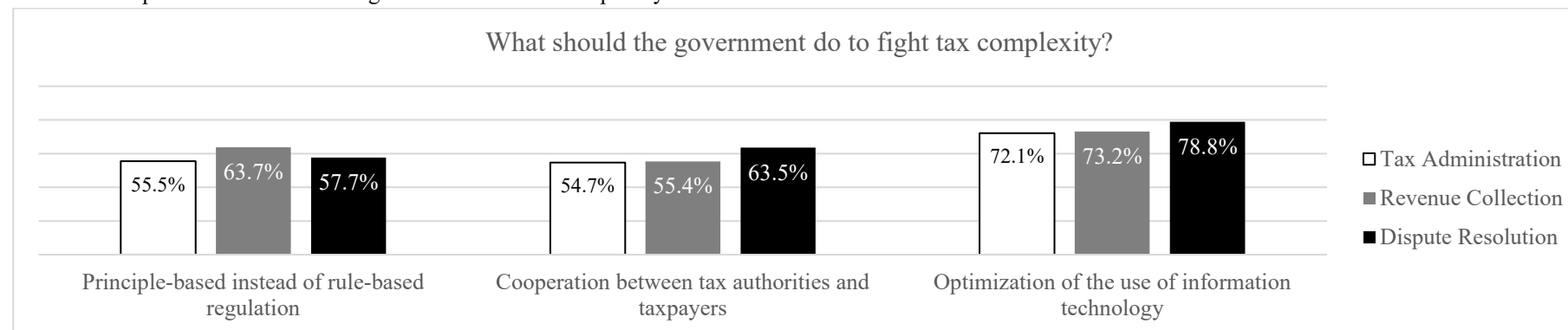
Notes: The figure visualizes the comparative analysis on tax complexity between revenue collection officers and dispute resolution officers. Panel A presents the perceived disadvantages of tax complexity, divided by the subsamples of revenue collection and dispute resolution. Panel B presents the preferred strategies to address tax complexity, divided by the subsamples of revenue collection and dispute resolution.

**Table 1: Sample Selection**

| Selection procedures | Tax Administration | Taxpayers | Total |
|---|---|---|---|
| Total responses | 914 | 213 | 1127 |
| Less: progress less than 50% | 486 | 115 | 601 |
| Less: completion time less than 5 minutes | 10 | 2 | 12 |
| Less: completion time more than 3 hours | 27 | 11 | 38 |
| Final Sample | 391 | 85 | 476 |

Notes: The table presents the sample selection procedures. In the first step, we exclude responses with less than 50 % completion of the survey. Afterwards, we exclude responses with less than 5 minutes and more than 3 hours of completion time.

**Table 2: The Demography of the Sample**

Panel A: General Demography

Respondent Group

|  | Freq. | Percent |
|---|---|---|
| Tax Officer | 391 | 82.14 |
| Corporate Taxpayer | 85 | 17.86 |
| Total | 476 | 100.00 |

Working Time in Taxation

|  | Tax Administration | | | Taxpayer | | |
|---|---|---|---|---|---|---|
|  | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 15 years or more | 226 | 57.80 | 57.80 | 13 | 15.29 | 15.29 |
| 10 years or more but fewer than 15 years | 79 | 20.20 | 78.00 | 15 | 17.65 | 32.94 |
| 5 years or more but fewer than 10 years | 50 | 12.79 | 90.79 | 20 | 23.53 | 56.47 |
| Fewer than 5 years | 17 | 4.35 | 95.14 | 33 | 38.82 | 95.29 |
| No answer | 19 | 4.86 | 100.00 | 4 | 4.71 | 100.00 |
| Total | 391 | 100.00 | | 85 | 100.00 | |

Highest Education

|  | Tax Administration | | | Taxpayer | | |
|---|---|---|---|---|---|---|
|  | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| Doctoral or equivalent level | 3 | 0.77 | 0.77 | 1 | 1.18 | 1.18 |
| Master or equivalent level | 150 | 38.36 | 39.13 | 16 | 18.82 | 20.00 |
| Bachelor or equivalent level | 155 | 39.64 | 78.77 | 57 | 67.06 | 87.06 |
| Diploma III | 31 | 7.93 | 86.70 | 7 | 8.24 | 95.30 |
| Diploma I or II | 29 | 7.42 | 94.12 | . | . | . |
| Other | 4 | 1.02 | 95.14 | . | . | . |
| No answer | 19 | 4.86 | 100.00 | 4 | 4.71 | 100.00 |
| Total | 391 | 100.00 | | 85 | 100.00 | |

Field of Education

|  | Tax Administration | | Taxpayer | |
|---|---|---|---|---|
|  | Freq. | Percent | Freq. | Percent |
| Fiscal Policy | 41 | 10.49 | 13 | 15.29 |
| Law | 23 | 5.88 | 2 | 2.35 |
| Business and administration | 148 | 37.85 | 32 | 37.65 |
| Other | 160 | 40.92 | 34 | 40.00 |
| No answer | 19 | 4.86 | 4 | 4.71 |
| Total | 391 | 100.00 | 85 | 100.00 |

Gender

|  | Tax Administration | | Taxpayer | |
|---|---|---|---|---|
|  | Freq. | Percent | Freq. | Percent |
| Prefer not to answer | 16 | 4.09 | 3 | 3.53 |
| Female | 81 | 20.72 | 35 | 41.18 |
| Male | 275 | 70.33 | 43 | 50.59 |
| No answer | 19 | 4.86 | 4 | 4.71 |
| Total | 391 | 100.00 | 85 | 100.00 |

Panel B: Demography of Tax Administration

Current Position Tax Administration

|  | Freq. | Percent | Cum. |
|---|---|---|---|
| Echelon Officer/Management | 134 | 34.27 | 34.27 |
| Account Representative | 77 | 19.69 | 53.96 |
| Other Administrative Staff | 56 | 14.32 | 69.28 |
| Other | 41 | 10.49 | 78.77 |
| Tax Objection/Appeal Reviewer | 39 | 9.97 | 88.74 |
| Tax Auditor | 25 | 6.39 | 95.13 |
| No answer | 19 | 4.86 | 100.00 |
| Total | 391 | 100.00 | |

Main Focus Tax Administration

|  | Freq. | Percent |
|---|---|---|
| Tax revenue collection | 157 | 40.15 |
| Tax disputes | 52 | 13.30 |
| Taxpayers service | 52 | 13.30 |
| Other | 43 | 11.00 |
| General management | 37 | 9.46 |
| Public relations | 15 | 3.84 |
| Tax regulation | 12 | 3.07 |
| Information infrastructure | 4 | 1.02 |
| No answer | 19 | 4.86 |
| Total | 391 | 100.00 |

Office Type

|  | Freq. | Percent | Cum. |
|---|---|---|---|
| Head Office | 33 | 8.44 | 8.44 |
| Regional Office | 92 | 23.53 | 31.97 |
| Large/Special Taxpayers Office | 44 | 11.25 | 43.22 |
| Medium Taxpayers Tax Office | 14 | 3.58 | 46,80 |
| Small-taxpayers Tax Office | 175 | 44.76 | 94.56 |
| Other | 14 | 3.58 | 95.14 |
| No answer | 19 | 4.86 | 100.00 |
| Total | 391 | 100.00 | |

Panel C: Demography of Taxpayers

Current Position Taxpayer

|  | Freq. | Percent | Cum. |
|---|---|---|---|
| Manager/Senior Staff | 36 | 42.35 | 42.35 |
| Junior Assistant/Staff | 28 | 32.94 | 75.29 |
| Director/Partner/Principal | 10 | 11.76 | 87.05 |
| Other | 7 | 8.24 | 95.27 |
| No answer | 4 | 4.71 | 100.00 |
| Total | 85 | 100.00 | |

Office Type Taxpayer

|  | Freq. | Percent | Cum. |
|---|---|---|---|
| Large/Special Taxpayers Office | 16 | 18.82 | 18.82 |
| Medium Taxpayers Tax Office | 24 | 28.24 | 47.06 |
| Small-taxpayers Tax Office | 41 | 48.24 | 95.30 |
| No answer | 4 | 4.71 | 100.00 |
| Total | 85 | 100.00 | |

Notes: The tables present the demographic characteristics of the sample. Panel A details the general demographic features of the entire sample, while Panel B focuses on the demographic attributes of the tax officers, and Panel C outlines those of the taxpayers.

**Table 3: Complexity in the Tax Code**

Panel A: Tax Code Complexity

| Regulations | N | Mean | Std. dev. | Var. coeff. | Min | 25% | 50% | 75% | Max. |
|---|---|---|---|---|---|---|---|---|---|
| Transfer pricing | 391 | 0.787 | 0.164 | 0.209 | 0 | 0.70 | 0.80 | 0.95 | 1 |
| Statutory tax rate | 391 | 0.754 | 0.183 | 0.243 | 0 | 0.65 | 0.75 | 0.90 | 1 |
| Dividends | 391 | 0.738 | 0.181 | 0.245 | 0 | 0.60 | 0.75 | 0.85 | 1 |
| Capital gains/losses | 391 | 0.734 | 0.182 | 0.248 | 0 | 0.60 | 0.75 | 0.85 | 1 |
| Interest | 391 | 0.733 | 0.183 | 0.250 | 0 | 0.60 | 0.75 | 0.85 | 1 |
| Permanent establishment | 391 | 0.733 | 0.182 | 0.248 | 0 | 0.65 | 0.75 | 0.85 | 1 |
| Royalties | 391 | 0.731 | 0.184 | 0.251 | 0 | 0.60 | 0.75 | 0.85 | 1 |
| Loss offset | 391 | 0.729 | 0.186 | 0.256 | 0 | 0.60 | 0.75 | 0.85 | 1 |
| Depreciation & amortization | 391 | 0.720 | 0.183 | 0.254 | 0 | 0.60 | 0.75 | 0.85 | 1 |
| Investment incentives | 391 | 0.709 | 0.181 | 0.255 | 0 | 0.60 | 0.75 | 0.80 | 1 |
| Corporate reorganization | 391 | 0.695 | 0.193 | 0.277 | 0 | 0.55 | 0.75 | 0.80 | 1 |
| Code index | 391 | 0.733 | 0.162 | 0.027 | 0 | 0.64 | 0.75 | 0.83 | 1 |

Panel B: Tax Complexity Drivers of Tax Regulations

| Drivers | N | Mean | Std. dev. | Var. coeff. | Min | 25% | 50% | 75% | Max. |
|---|---|---|---|---|---|---|---|---|---|
| Record keeping | 391 | 0.745 | 0.186 | 0.250 | 0 | 0.614 | 0.750 | 0.909 | 1 |
| Ambiguity & interpretation | 391 | 0.738 | 0.185 | 0.250 | 0 | 0.614 | 0.750 | 0.886 | 1 |
| Computation | 391 | 0.736 | 0.183 | 0.249 | 0 | 0.636 | 0.750 | 0.864 | 1 |
| Detail | 391 | 0.733 | 0.182 | 0.249 | 0 | 0.614 | 0.750 | 0.841 | 1 |
| Change | 391 | 0.712 | 0.185 | 0.260 | 0 | 0.591 | 0.750 | 0.795 | 1 |

Notes: The tables present the complexity of eleven regulations of the tax code. Panel A presents the mean complexity values of all 391 tax administration respondents, standard deviations, variance coefficients, and min., max., 25%, 50% and 75% values of the regulations. Panel B shows the mean complexity drivers for the 11 regulations and the respective statistics. Items are sorted by value.

**Table 4: Complexity in the Tax Framework**

| Procedures | N | Mean | Std. dev. | Var. coeff. | Min | 25% | 50% | 75% | Max. |
|---|---|---|---|---|---|---|---|---|---|
| Tax law enactment | 391 | 0.372 | 0.247 | 0.664 | 0 | 0.200 | 0.400 | 0.600 | 1 |
| Tax appeals | 391 | 0.273 | 0.234 | 0.856 | 0 | 0.050 | 0.250 | 0.450 | 1 |
| Tax guidance | 391 | 0.273 | 0.146 | 0.537 | 0 | 0.200 | 0.250 | 0.350 | 0.8 |
| Tax filing & payment | 389 | 0.259 | 0.187 | 0.720 | 0 | 0.139 | 0.222 | 0.333 | 1 |
| Tax audits | 391 | 0.251 | 0.210 | 0.834 | 0 | 0.111 | 0.250 | 0.361 | 1 |
| Framework index | 389 | 0.286 | 0.140 | 0.020 | 0 | 0.181 | 0.271 | 0.367 | 0.838 |

Notes: The table presents the complexity of five procedures in the tax framework. It presents the mean complexity values of all 391 tax administration respondents, standard deviations, variance coefficients, and min., max., 25%, 50% and 75% values of the regulations. Two respondents refused to answer in the dimension tax filing & payment. Items are sorted by value.

**Table 5: Comparative Analysis: Tax Officers and Taxpayers**

Panel A: Tax Code Complexity

| Regulations | Tax Officers | | Taxpayers | | Difference | p-value |
|---|---|---|---|---|---|---|
| | Obs. | Mean | Obs. | Mean | | |
| Transfer pricing | 391 | 0.787* | 85 | 0.702* | (0.085) | 0.000 |
| Statutory tax rate | 391 | 0.754 | 85 | 0.747 | (0.007) | 0.753 |
| Dividends | 391 | 0.739* | 85 | 0.671* | (0.068) | 0.002 |
| Capital gains | 391 | 0.734* | 85 | 0.664* | (0.069) | 0.002 |
| Interest | 391 | 0.733* | 85 | 0.664* | (0.069) | 0.002 |
| Permanent establishment | 391 | 0.733* | 85 | 0.653* | (0.080) | 0.000 |
| Royalties | 391 | 0.732* | 85 | 0.679* | (0.052) | 0.019 |
| Loss offset | 391 | 0.729* | 85 | 0.681* | (0.048) | 0.034 |
| Depreciation & amortization | 391 | 0.720* | 85 | 0.667* | (0.053) | 0.016 |
| Investment incentives | 391 | 0.709 | 85 | 0.674 | (0.035) | 0.111 |
| Corporate reorganization | 391 | 0.695* | 85 | 0.638* | (0.056) | 0.017 |
| Mean | 391 | 0.734* | 85 | 0.678* | (0.045) | 0.021 |

Panel B: Tax Framework Complexity

| Procedures | Tax Officers | | Taxpayers | | Difference | p-value |
|---|---|---|---|---|---|---|
| | Obs. | Mean | Obs. | Mean | | |
| Tax law enactment | 391 | 0.372 | 85 | 0.391 | 0.019 | 0.527 |
| Tax guidance | 391 | 0.273* | 85 | 0.414* | 0.142 | 0.000 |
| Tax appeal | 391 | 0.273* | 85 | 0.404* | 0.131 | 0.000 |
| Tax filing & payment | 389 | 0.259* | 85 | 0.324* | 0.065 | 0.004 |
| Tax audits | 391 | 0.251* | 85 | 0.412* | 0.161 | 0.000 |
| Mean | 391 | 0.300* | 85 | 0.406* | 0.106 | 0.000 |

Panel C: Hierarchical Ranks of Complexity Drivers of Regulation Transfer Pricing

| No | Tax Officers | | Taxpayers | |
|---|---|---|---|---|
| 1 | Record keeping | 0.808* | Record keeping | 0.750* |
| 2 | Ambiguity & interpretation | 0.801* | Computation | 0.703* |
| 3 | Computation | 0.783* | Detail | 0.700* |
| 4 | Detail | 0.782* | Ambiguity & interpretation | 0.685* |
| 5 | Change | 0.763* | Change | 0.671* |
| | Mean | 0.787* | Mean | 0.702* |

Notes: The tables present a comparative analysis of the perceived levels of tax complexity between taxpayers and tax officers. Panels A and B respectively report the comparisons within the dimensions of tax regulation and tax procedure. Items are sorted by tax officers value. Panel C displays rank of complexity drivers for transfer pricing by subgroups tax officers and taxpayers . * indicates a statistically significant difference between the two groups at the 10% level.

**Table 6: Comparative Analysis: Revenue Collection and Dispute Resolution Officers**

Panel A: Tax Code Complexity

| Regulations | Revenue Collection | | Dispute Resolution | | Difference | p-value |
|---|---|---|---|---|---|---|
| | Obs. | Mean | Obs. | Mean | | |
| Transfer Pricing | 157 | 0.783 | 52 | 0.826 | (0.043) | 0.107 |
| Statutory Tax Rate | 157 | 0.744 | 52 | 0.741 | 0.003 | 0.923 |
| Dividends | 157 | 0.732 | 52 | 0.760 | (0.028) | 0.346 |
| Interest | 157 | 0.728 | 52 | 0.756 | (0.027) | 0.355 |
| Royalties | 157 | 0.727 | 52 | 0.755 | (0.028) | 0.352 |
| Capital Gains/Losses | 157 | 0.722 | 52 | 0.764 | (0.042) | 0.147 |
| Loss Offset | 157 | 0.722 | 52 | 0.728 | (0.006) | 0.840 |
| Depreciation & Amortization | 157 | 0.721 | 52 | 0.739 | (0.018) | 0.534 |
| Permanent Establishment | 157 | 0.716* | 52 | 0.779* | (0.063) | 0.027 |
| Investment Incentives | 157 | 0.689 | 52 | 0.717 | (0.028) | 0.336 |
| Corporate Reorganization | 157 | 0.684 | 52 | 0.704 | (0.020) | 0.505 |
| Mean | 157 | 0.724 | 52 | 0.752 | (0.027) | 0.295 |

| No | Revenue Collection | | Dispute Resolution | |
|---|---|---|---|---|
| 1 | Transfer Pricing | 0.783 | Transfer Pricing | 0.826 |
| 2 | Statutory Tax Rate | 0.744 | Permanent Establishment | 0.779* |
| 3 | Dividends | 0.732 | Capital Gains/Losses | 0.764 |
| 4 | Interest | 0.728 | Dividends | 0.760 |
| 5 | Royalties | 0.727 | Interest | 0.756 |
| 6 | Capital Gains/Losses | 0.722 | Royalties | 0.755 |
| 7 | Loss Offset | 0.722 | Statutory Tax Rate | 0.741 |
| 8 | Depreciation & Amortization | 0.721 | Depreciation & Amortization | 0.739 |
| 9 | Permanent Establishment | 0.716* | Loss Offset | 0.728 |
| 10 | Investment Incentives | 0.689 | Investment Incentives | 0.717 |
| 11 | Corporate Reorganization | 0.684 | Corporate Reorganization | 0.704 |
| | Mean | 0.724 | Mean | 0.752 |

Panel B: Tax Framework Complexity

| Procedures | Revenue Collection | | Dispute Resolution | | Difference | p-value |
|---|---|---|---|---|---|---|
| | Obs. | Mean | Obs. | Mean | | |
| Tax law enactment | 157 | 0.373 | 52 | 0.381 | (0.008) | 0.846 |
| Tax appeal | 157 | 0.288 | 52 | 0.283 | 0.006 | 0.875 |
| Tax guidance | 157 | 0.286* | 52 | 0.240* | 0.046 | 0.037 |
| Tax filing & payment | 157 | 0.258 | 52 | 0.253 | 0.005 | 0.864 |
| Tax audits | 157 | 0.238 | 52 | 0.277 | (0.039) | 0.215 |
| Mean | 157 | 0.289 | 52 | 0.287 | 0.002 | 0.923 |

Panel C: Drivers of Tax Code Complexity

Transfer Pricing

| No | Revenue Collection | | Dispute Resolution | |
|---|---|---|---|---|
| 1 | Record keeping | 0.806 | Ambiguity & interpretation | 0.856* |
| 2 | Detail | 0.788 | Record keeping | 0.851 |
| 3 | Ambiguity & interpretation | 0.785* | Computation | 0.832 |
| 4 | Computation | 0.785 | Detail | 0.817 |
| 5 | Change | 0.752 | Change | 0.774 |

Statutory Tax Rate

| No | Revenue Collection | | Dispute Resolution | |
|---|---|---|---|---|
| 1 | Computation | 0.756 | Detail | 0.769 |
| 2 | Detail | 0.753 | Ambiguity & interpretation | 0.755 |
| 3 | Ambiguity & interpretation | 0.742 | Computation | 0.750 |
| 4 | Record keeping | 0.739 | Record keeping | 0.740 |
| 5 | Change | 0.731 | Change | 0.692 |

Permanent Establishment

| No | Revenue Collection | | Dispute Resolution | |
|---|---|---|---|---|
| 1 | Record keeping | 0.742* | Ambiguity & interpretation | 0.817* |
| 2 | Detail | 0.736 | Record keeping | 0.798* |
| 3 | Computation | 0.720 | Detail | 0.784 |
| 4 | Ambiguity & interpretation | 0.705* | Computation | 0.755 |
| 5 | Change | 0.678* | Change | 0.740* |

Notes: The tables present a comparative analysis of the perceived levels of tax complexity between tax administration employees in the revenue collection and employees in the dispute resolution. Panels A and B respectively report the comparisons within the dimensions of tax regulation and tax procedure. Items are sorted by revenue collection value. Panel C presents the drivers of the most complex tax regulations: transfer pricing, statutory tax rates and permanent establishment. * indicates a statistically significant difference between the two groups at the 10% level.

**Table 7: Comparative Analysis: The Size of the Administered Taxpayers**

Panel A: Tax Code Complexity

| Regulations | Large/Medium Taxpayer Officers | | Small-Taxpayer Officers | | Difference | p-value |
|---|---|---|---|---|---|---|
| | Obs. | Mean | Obs. | Mean | | |
| Transfer pricing | 58 | 0.809 | 175 | 0.780 | 0.028 | 0.235 |
| Statutory tax rate | 58 | 0.747 | 175 | 0.769 | (0.021) | 0.408 |
| Dividends | 58 | 0.741 | 175 | 0.744 | (0.003) | 0.920 |
| Interest | 58 | 0.731 | 175 | 0.742 | (0.011) | 0.662 |
| Royalties | 58 | 0.727 | 175 | 0.735 | (0.009) | 0.742 |
| Capital gains/losses | 58 | 0.714 | 175 | 0.740 | (0.026) | 0.305 |
| Loss Offset | 58 | 0.711 | 175 | 0.750 | (0.039) | 0.140 |
| Depreciation & amortization | 58 | 0.709 | 175 | 0.735 | (0.025) | 0.342 |
| Permanent establishment | 58 | 0.702 | 175 | 0.739 | (0.038) | 0.150 |
| Investment incentives | 58 | 0.691 | 175 | 0.723 | (0.032) | 0.198 |
| Corporate reorganization | 58 | 0.673 | 175 | 0.713 | (0.040) | 0.145 |
| Mean | 58 | 0.723 | 175 | 0.743 | (0.020) | 0.390 |

Panel B: Tax Framework Complexity

| Procedures | Large/Medium Taxpayers Office | | Small-Taxpayers Office | | Difference | p-value |
|---|---|---|---|---|---|---|
| | Obs. | Mean | Obs. | Mean | | |
| Tax law enactment | 58 | 0.390 | 175 | 0.366 | 0.024 | 0.518 |
| Tax appeals | 58 | 0.313 | 175 | 0.274 | 0.039 | 0.272 |
| Tax filings & payment | 58 | 0.260 | 175 | 0.273 | (0.013) | 0.654 |
| Tax guidance | 58 | 0.257* | 175 | 0.300* | (0.043) | 0.056 |
| Tax audits | 58 | 0.238 | 175 | 0.251 | (0.013) | 0.693 |
| Mean | 58 | 0.292 | 175 | 0.293 | 0.001 | 0.946 |

Notes: The table presents a comparative analysis of the perceived levels of tax complexity between tax officers working in large/medium taxpayers offices and tax officers working in small-taxpayers tax offices. Panels A and B respectively report the comparisons within the dimensions of tax regulation and tax procedure. Items are sorted by Large-taxpayers officers' value. * indicates a statistically significant difference between the two groups at the 10% level.

# Appendix

## Appendix 1: Survey Results Measurement Strategy

Panel A Tax Code Complexity Drivers

| No | Complexity driver | Survey Question / Definition provided in the survey (in italics) | Measurement 0 = least complex, 1 = most complex |
|---|---|---|---|
| 1 | Ambiguity & interpretation | To what extent do you think "ambiguity & interpretation" contribute to the complexity of the regulations listed below? *"Ambiguity & interpretation" means a regulation is phrased in an unclear, imprecise and/or ambiguous manner so that different interpretations are possible.* | 0 = no extent 0.25 = little extent 0.5 = some extent 0.75 = great extent 1 = very great extent |
| 2 | Change | To what extent do you think "change" contributes to the complexity of the regulations listed below? *"Change" means a regulation is frequently changed and the changes are extensive in terms of quantity and/or scope* | 0 = no extent 0.25 = little extent 0.5 = some extent 0.75 = great extent 1 = very great extent |
| 3 | Computation | To what extent do you think "computation" contributes to the complexity of the regulations listed below? *"Computation" means calculations necessary to prove a regulation's (non-)applicability and/or to determine the specific tax treatment.* | 0 = no extent 0.25 = little extent 0.5 = some extent 0.75 = great extent 1 = very great extent |
| 4 | Detail | To what extent do you think "detail" contributes to the complexity of the regulations listed below? *"Detail" means numerous rules, exceptions to rules and/or cross-references to other rules.* | 0 = no extent 0.25 = little extent 0.5 = some extent 0.75 = great extent 1 = very great extent |
| 5 | Record keeping | To what extent do you think "record keeping" contributes to the complexity of the regulations listed below? *"Record keeping" means records and documents must be kept to substantiate all claims under a regulation and/or to complete the tax return.* | 0 = no extent 0.25 = little extent 0.5 = some extent 0.75 = great extent 1 = very great extent |

Panel B Tax Framework Complexity Drivers

| No | Complexity driver | Survey Question / Definition provided in the survey (in italics) | Measurement 0 = least complex, 1 = most complex |
|---|---|---|---|
| | | | |
| **Dimension 1: Tax guidance** | | | |
| 1 | Public rulings | Does the tax authority provide sufficient documents in order to resolve uncertainties? *Public rulings are published statements describing how a tax authority will apply the tax code in particular situations* | 0 = always 0.25 = often 0.5 = sometimes 0.75 = rarely 1 = never |
| 2 | Private rulings | Does the tax authority provide sufficient documents in order to resolve uncertainties? *Private rulings are unpublished statements by the tax authority in response to specific requests from taxpayers seeking clarification of how tax law would apply in relation to a proposed or completed transaction.* | 0 = always 0.25 = often 0.5 = sometimes 0.75 = rarely 1 = never |
| 3 | Oral or written advice | Does the tax authority provide sufficient documents in order to resolve uncertainties? *Oral or written advice in this context is an informal opinion on tax matters that taxpayers can request by contacting the tax authority (e.g., by telephone or email).* | 0 = always 0.25 = often 0.5 = sometimes 0.75 = rarely 1 = never |
| 4 | Substantial business issues | Are there various substantial business issues and/or transactions whose tax treatment is not codified in tax law? | 0 = no 1 = yes |
| 5 | Soft law | To what extent does the existence of international soft law offer support by providing additional information in dealing with tax law? *International soft law is defined as rules that are neither strictly binding in nature nor completely lacking legal significance, e.g., the OECD guidelines.* | 0 = always 0.25 = often 0.5 = sometimes 0.75 = rarely 1 = never |
| | | | |
| **Dimension 2: Tax law enactment** | | | |
| 1 | Access to enacted tax legislation | Regarding the tax legislative process, which of the following aspects regularly cause problems? (a) Access to enacted tax legislation | 0 = not selected 1 = selected |
| 2 | Influence of third parties | Regarding the tax legislative process, which of the following aspects regularly cause problems? (b) Influence of third parties | 0 = not selected 1 = selected |
| 3 | Quality of drafting | Regarding the tax legislative process, which of the following aspects regularly cause problems? (c) Quality of tax legislation drafting | 0 = not selected 1 = selected |
| 4 | Time at which legislation becomes effective | Regarding the tax legislative process, which of the following aspects regularly cause problems? (d) Time at which tax legislation becomes effective | 0 = not selected 1 = selected |
| 5 | Time between the announcement and enactment of tax changes | Regarding the tax legislative process, which of the following aspects regularly cause problems? (e) Time between the announcement of tax changes and their enactment | 0 = not selected 1 = selected |

| 6 | Participation in legislative process | Do you actively participate in legislative processes in tax law, or have you already participated in the legislative process, e.g., by preparing drafts or giving opinions? | 0 = always<br>0.25 = often<br>0.5 = sometimes<br>0.75 = rarely<br>1 = never |
|---|---|---|---|

**Dimension 3: Tax filings and payments**

| 1 | Computing tax payments | Regarding the payment of corporate income taxes, which of the following aspects regularly cause problems?<br>(a) Computing tax payments | 0 = not selected<br>1 = selected |
|---|---|---|---|
| 2 | Determining due dates for tax payments | Regarding the payment of corporate income taxes, which of the following aspects regularly cause problems?<br>(b) Determining due dates for tax payments | 0 = not selected<br>1 = selected |
| 3 | Refunding overpaid corporate income taxes | Regarding the payment of corporate income taxes, which of the following aspects regularly cause problems?<br>(c) Refunding overpaid corporate income taxes | 0 = not selected<br>1 = selected |
| 4 | (Electronic) remittance of tax payments | Regarding the payment of corporate income taxes, which of the following aspects regularly cause problems?<br>(d) (Electronic) remittance of tax payments | 0 = not selected<br>1 = selected |
| 5 | Determining due dates for filing tax returns | Regarding the filing of corporate income tax returns, which of the following aspects regularly cause problems?<br>(a) Determining due dates for filing tax returns | 0 = not selected<br>1 = selected |
| 6 | Managing the number of tax returns during a year | Regarding the filing of corporate income tax returns, which of the following aspects regularly cause problems?<br>(b) Managing the number of tax returns during a year | 0 = not selected<br>1 = selected |
| 7 | Preparing tax returns | Regarding the filing of corporate income tax returns, which of the following aspects regularly cause problems?<br>(c) Preparing tax returns | 0 = not selected<br>1 = selected |
| 8 | (Electronic) transmission of tax returns | Regarding the filing of corporate income tax returns, which of the following aspects regularly cause problems?<br>(d) (Electronic) transmission of tax returns | 0 = not selected<br>1 = selected |
| 9 | Instructions for filing tax returns | To what extent does the tax authority provide helpful written instructions on how to file tax returns? | 0 = Very Great Extent<br>0.25 = Great Extent<br>0.5 = Some Extent<br>0.75 = Little Extent<br>1 = No Extent |

**Dimension 4: Tax audits**

| 1 | Outline of tax audit process | Does the tax authority provide sufficient additional documents or guidance that clearly outline the tax audit process? | 0 = always<br>0.25 = often<br>0.5 = sometimes<br>0.75 = rarely<br>1 = never |
|---|---|---|---|
| 2 | Tax audit cycle | Regarding the anticipation of tax audits, which of the following do you consider a serious problem? | 0 = not selected<br>1 = selected |

| | | (a) Absence of a regular tax audit cycle | |
|---|---|---|---|
| 3 | Notification of the upcoming tax audit | Regarding the anticipation of tax audits, which of the following do you consider a serious problem? (b) Late or no notification of the upcoming tax audit | 0 = not selected 1 = selected |
| 4 | Disclosure of selection criteria for tax audit target | Regarding the anticipation of tax audits, which of the following do you consider a serious problem? (c) Little or no disclosure of selection criteria for tax audit targets | 0 = not selected 1 = selected |
| 5 | Communication of topics to be covered by the tax audit | Regarding the anticipation of tax audits, which of the following do you consider a serious problem? (d) Poor or no communication of topics to be covered by the tax audit | 0 = not selected 1 = selected |
| 6 | Decisions by tax officers | Regarding the tax audit process, which of the following do you consider a serious problem? (a) Inconsistent decisions by tax officers | 0 = not selected 1 = selected |
| 7 | Sanctions imposed in case of violations | Regarding the tax audit process, which of the following do you consider a serious problem? (b) Ineffectiveness of sanctions imposed in case of violations | 0 = not selected 1 = selected |
| 8 | Experience or technical skill of tax officers | Regarding the tax audit process, which of the following do you consider a serious problem? (c) Lack of experience or technical skill of tax officers | 0 = not selected 1 = selected |
| 9 | Behavior by tax officers | Regarding the tax audit process, which of the following do you consider a serious problem? (d) Offensive or unethical behavior by tax officers | 0 = not selected 1 = selected |

| | Dimension 5: Tax appeals | | |
|---|---|---|---|
| 1 | Outline of tax objection process | Does the tax authority provide sufficient additional documents or guidance that clearly outline the tax objection/appeal process? Objection. | 0 = always 0.25 = often 0.5 = sometimes 0.75 = rarely 1 = never |
| 2 | Outline of tax appeal process | Does the tax authority provide sufficient additional documents or guidance that clearly outline the tax objection/appeal process? Appeal | 0 = always 0.25 = often 0.5 = sometimes 0.75 = rarely 1 = never |
| 3 | Decisions by tax officers in tax objections | Regarding the treatment of tax objection/appeals, which of the following do you consider a serious problem? Objection: (a) Inconsistent decisions | 0 = not selected 1 = selected |
| 4 | Influence of third parties in tax objections | Regarding the treatment of tax objection/appeals, which of the following do you consider a serious problem? Objection:(b) Influence of third parties | 0 = not selected 1 = selected |
| 5 | Agents/staff in tax objections | Regarding the treatment of tax objection/appeals, which of the following do you consider a serious problem? Objection:(c) Lack of (specialized) agents/staff | 0 = not selected 1 = selected |
| 6 | Completion time in tax objections | Regarding the treatment of tax objection/appeals, which of the following do you consider a serious problem? Objection:(d) Unpredictable completion time | 0 = not selected 1 = selected |
| 7 | Decisions by tax officers in tax appeals | Regarding the treatment of tax objection/appeals, which of the following do you consider a serious problem? Appeal: (a) Inconsistent decisions | 0 = not selected 1 = selected |

| 8 | Influence of third parties in tax appeals | Regarding the treatment of tax objection/appeals, which of the following do you consider a serious problem? Appeal:(b) Influence of third parties | 0 = not selected<br>1 = selected |
| 9 | Agents/staff in tax objections | Regarding the treatment of tax objection/appeals, which of the following do you consider a serious problem? Appeal:(c) Lack of (specialized) agents/staff | 0 = not selected<br>1 = selected |
| 10 | Completion time in tax objections | Regarding the treatment of tax objection/appeals, which of the following do you consider a serious problem? Appeal:(d) Unpredictable completion time | 0 = not selected<br>1 = selected |

## Appendix 2: Survey Instrument

Indonesian Tax Complexity Survey

Q1.1
**Welcome to the Indonesian Tax Complexity Survey!**
 Dear Indonesian tax officers and taxpayers,
Thank you for participating in our survey study! We would like your help and ask you to answer a few questions about tax complexity. This survey is completely anonymous and confidential. It is not possible to identify you or your answers. Data will be analyzed in the aggregate. The survey should take about 20 minutes.

We have set up this research project to gain systematic insights into the development and state of tax complexity to which tax administrations and taxpayers are exposed in Indonesia.

Prior studies document that tax complexity has become an important feature of a tax system in recent years, inducing compliance costs, tax planning opportunities and being likely to influence the decisions of tax administrations and taxpayers in different ways. We want to identify areas of the tax code and framework that particularly drive tax complexity. For this purpose, we need your view on tax complexity and your professional experience with tax complexity.

Thank you for helping us to contribute to improving the tax system.

Best regards,

Fernando Siahaan, MSc. (fernando.siahaan@wu.ac.at)
Vienna University of Economics and Business
Prof. Dr. Caren Sureth-Sloane
Vienna University of Economics and Business & Paderborn University
Adrian Schipp, MSc.
Paderborn University

Q1.2
By participating in the survey you confirm the Information on data processing.

o   I am a Tax Officer

o   I am working for/own a corporate taxpayer

o   I do not want to participate

Q2.1
**Tax code complexity**
*"Tax code complexity" describes the difficulty of reading, understanding and complying with tax regulations that are affected by five complexity drivers: ambiguity & interpretation, change, computation, detail, and recordkeeping. Therefore, we identified 11 internationally comparable tax regulations serving as dimensions for the tax code complexity.*
How important do you consider the following regulations to be?
*"Important" means that this regulation has a significant impact (i.e., expressed as time spent in your daily work).*

| | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|---|---|---|---|---|---|
| Capital Gains/Losses | o | o | o | o | o |
| Corporate Reorganization | o | o | o | o | o |
| Depreciation & Amortization | o | o | o | o | o |
| Investment Incentives | o | o | o | o | o |
| Statutory Tax Rate | o | o | o | o | o |
| Loss Offset | o | o | o | o | o |
| Royalties | o | o | o | o | o |
| Dividends | o | o | o | o | o |
| Interest | o | o | o | o | o |
| Transfer Pricing | o | o | o | o | o |
| Permanent Establishment | o | o | o | o | o |

Q2.2
To what extent do you think "ambiguity & interpretation" contribute to the complexity of the regulations listed below?

*"Ambiguity & interpretation" means a regulation is phrased in an unclear, imprecise and/or ambiguous manner so that different interpretations are possible.*

|  | No Extent | Little Extent | Some Extent | Great Extent | Very Great Extent |
|---|---|---|---|---|---|
| Capital Gains/Losses | o | o | o | o | o |
| Corporate Reorganization | o | o | o | o | o |
| Depreciation & Amortization | o | o | o | o | o |
| Investment Incentives | o | o | o | o | o |
| Statutory Tax Rate | o | o | o | o | o |
| Loss Offset | o | o | o | o | o |
| Royalties | o | o | o | o | o |
| Dividends | o | o | o | o | o |
| Interest | o | o | o | o | o |
| Transfer Pricing | o | o | o | o | o |
| Permanent Establishment | o | o | o | o | o |

Q2.3

To what extent do you think "change" contributes to the complexity of the regulations listed below?

*"Change" means a regulation is frequently changed and the changes are extensive in terms of quantity and/or scope.*

|  | No Extent | Little Extent | Some Extent | Great Extent | Very Great Extent |
|---|---|---|---|---|---|
| Capital Gains/Losses | o | o | o | o | o |
| Corporate Reorganization | o | o | o | o | o |
| Depreciation & Amortization | o | o | o | o | o |
| Investment Incentives | o | o | o | o | o |
| Statutory Tax Rate | o | o | o | o | o |
| Loss Offset | o | o | o | o | o |
| Royalties | o | o | o | o | o |
| Dividends | o | o | o | o | o |
| Interest | o | o | o | o | o |
| Transfer Pricing | o | o | o | o | o |
| Permanent Establishment | o | o | o | o | o |

Q2.4

To what extent do you think "computation" contributes to the complexity of the regulations listed below?
*"Computation" means calculations necessary to prove a regulation's (non-)applicability and/or to determine the specific tax treatment.*

| | No Extent | Little Extent | Some Extent | Great Extent | Very Great Extent |
|---|---|---|---|---|---|
| Capital Gains/Losses | o | o | o | o | o |
| Corporate Reorganization | o | o | o | o | o |
| Depreciation & Amortization | o | o | o | o | o |
| Investment Incentives | o | o | o | o | o |
| Statutory Tax Rate | o | o | o | o | o |
| Loss Offset | o | o | o | o | o |
| Royalties | o | o | o | o | o |
| Dividends | o | o | o | o | o |
| Interest | o | o | o | o | o |
| Transfer Pricing | o | o | o | o | o |
| Permanent Establishment | o | o | o | o | o |

Q2.5
To what extent do you think "detail" contributes to the complexity of the regulations listed below?
*"Detail" means numerous rules, exceptions to rules and/or cross-references to other rules.*

|  | No Extent | Little Extent | Some Extent | Great Extent | Very Great Extent |
|---|---|---|---|---|---|
| Capital Gains/Losses | ○ | ○ | ○ | ○ | ○ |
| Corporate Reorganization | ○ | ○ | ○ | ○ | ○ |
| Depreciation & Amortization | ○ | ○ | ○ | ○ | ○ |
| Investment Incentives | ○ | ○ | ○ | ○ | ○ |
| Statutory Tax Rate | ○ | ○ | ○ | ○ | ○ |
| Loss Offset | ○ | ○ | ○ | ○ | ○ |
| Royalties | ○ | ○ | ○ | ○ | ○ |
| Dividends | ○ | ○ | ○ | ○ | ○ |
| Interest | ○ | ○ | ○ | ○ | ○ |
| Transfer Pricing | ○ | ○ | ○ | ○ | ○ |
| Permanent Establishment | ○ | ○ | ○ | ○ | ○ |

Q2.6

To what extent do you think "record keeping" contributes to the complexity of the regulations listed below?

*"Record keeping" means records and documents must be kept to substantiate all claims under a regulation and/or to complete the tax return.*

|  | No Extent | Little Extent | Some Extent | Great Extent | Very Great Extent |
|---|---|---|---|---|---|
| Capital Gains/Losses | o | o | o | o | o |
| Corporate Reorganization | o | o | o | o | o |
| Depreciation & Amortization | o | o | o | o | o |
| Investment Incentives | o | o | o | o | o |
| Statutory Tax Rate | o | o | o | o | o |
| Loss Offset | o | o | o | o | o |
| Royalties | o | o | o | o | o |
| Dividends | o | o | o | o | o |
| Interest | o | o | o | o | o |
| Transfer Pricing | o | o | o | o | o |
| Permanent Establishment | o | o | o | o | o |

Q2.7

To what extent do you think do the drivers listed below on average contribute to the complexity of income tax rules?

|  | No Extent | Little Extent | Some Extent | Great Extent | Very Great Extent |
|---|---|---|---|---|---|
| Ambiguity & Interpretation | o | o | o | o | o |
| Change | o | o | o | o | o |
| Computation | o | o | o | o | o |
| Detail | o | o | o | o | o |
| Record Keeping | o | o | o | o | o |

Q3.1

**Tax framework complexity**

*"Tax framework complexity" describes the complexity that arises from the legislative and administrative processes and features within a tax system and is measured in five dimensions: guidance, enactment, payment and filing, audits, and objection and appeals.*

Does the tax authority provide sufficient documents in order to resolve uncertainties?

*Public rulings are published statements describing how a tax authority will apply the tax code in particular situations.*

*Private rulings are unpublished statements by the tax authority in response to specific requests from taxpayers seeking clarification of how tax law would apply in relation to a proposed or completed transaction.*

*Oral or written advice in this context is an informal opinion on tax matters that taxpayers can request by contacting the tax authority (e.g., by telephone or email).*

| | Never | Rarely | Sometimes | Often | Always |
|---|---|---|---|---|---|
| Public rulings | o | o | o | o | o |
| Private rulings | o | o | o | o | o |
| Oral or written advice | o | o | o | o | o |

Q3.2

Are there various substantial business issues and/or transactions whose tax treatment is not codified in tax law?

o   No

o   Yes (please mention) _____

Q3.3

To what extent does the existence of international soft law offer support by providing additional information in dealing with tax law?

*International soft law is defined as rules that are neither strictly binding in nature nor completely lacking legal significance, e.g., the OECD guidelines.*

o   Never

o   Rarely

o   Sometimes

o   Often

o   Always

Q3.4

Regarding the tax legislative process, which of the following aspects regularly cause problems?
(Check all answers that apply)

☐   Access to enacted tax legislation

☐   Influence of third parties

☐   Quality of tax legislation drafting

☐   Time at which tax legislation becomes effective

☐   Time between the announcement of tax changes and their enactment

☐   ⊗None of the above

Q3.5
Do you actively participate in legislative processes in tax law or have you already participated in the legislative process, e.g., by preparing drafts or giving opinions?

o   Never

o   Rarely

o   Sometimes

o   Often

o   Always

Q3.6
Regarding the payment of corporate income taxes, which of the following aspects regularly cause problems? (Check all answers that apply)

☐   Computing tax payments

☐   Determining due dates for tax payments

☐   Refunding overpaid corporate income taxes

☐   (Electronic) remittance of tax payments

☐   ⊗None of the above

Q3.7
Regarding the filing of corporate income tax returns, which of the following aspects regularly cause problems? (Check all answers that apply)

☐   Determining due dates for filing tax returns

☐   Managing the number of tax returns during a year

☐   Preparing tax returns

☐   (Electronic) transmission of tax returns

☐   ⊗None of the above

Q3.8
To what extent does the tax authority provide helpful written instructions on how to file tax returns?

o   No Extent

o   Little Extent

o   Some Extent

o   Great Extent

o   Very Great Extent

Q3.9
Does the tax authority provide sufficient additional documents or guidance that clearly outline the tax audit process?

o Never

o Rarely

o Sometimes

o Often

o Always

Q3.10
Regarding the anticipation of tax audits, which of the following do you consider a serious problem?
(Check all answers that apply)

☐ Absence of a regular tax audit cycle

☐ Late or no notification of the upcoming tax audit

☐ Little or no disclosure of selection criteria for tax audit targets

☐ Poor or no communication of topics to be covered by the tax audit

☐ ⊗None of the above

Q3.11
Regarding the tax audit process, which of the following do you consider a serious problem?
(Check all answers that apply)

☐ Inconsistent decisions by tax officers

☐ Ineffectiveness of sanctions imposed in case of violations

☐ Lack of experience or technical skill of tax officers

☐ Offensive or unethical behavior by tax officers

☐ ⊗None of the above

Q3.12
Does the tax authority provide sufficient additional documents or guidance that clearly outline the tax objection/appeal process?

|  | Never | Rarely | Sometimes | Often | Always |
|---|---|---|---|---|---|
| Objection | o | o | o | o | o |
| Appeal | o | o | o | o | o |

Q3.13

Regarding the treatment of tax objection/appeals, which of the following do you consider a serious problem?
(Check all answers that apply)

|  | Objection | Appeal |
|---|---|---|
| Inconsistent decisions | ☐ | ☐ |
| Influence of third parties | ☐ | ☐ |
| Lack of (specialized) agents/staff | ☐ | ☐ |
| Unpredictable completion time | ☐ | ☐ |
| ⊗None of the above | ☐ | ☐ |

**End of Block: Tax Framework Complexity**

Q4.1

**General Perception and Perspective on Tax Complexity**

How complex do you perceive and expect the "Tax Code" in general:

*"Tax code complexity" describes the difficulty of reading, understanding and complying with tax regulations that are affected by five complexity drivers: ambiguity & interpretation, change, computation, detail, and record keeping.*

*Perception means how you perceive tax complexity in reality.*

*Expectation means how you want the tax complexity to be in the future.*

|  | less complex      more complex |
|---|---|
|  | 0   10   20   30   40   50   60   70   80   90   100 |
| Perception |  |
| Expectation |  |
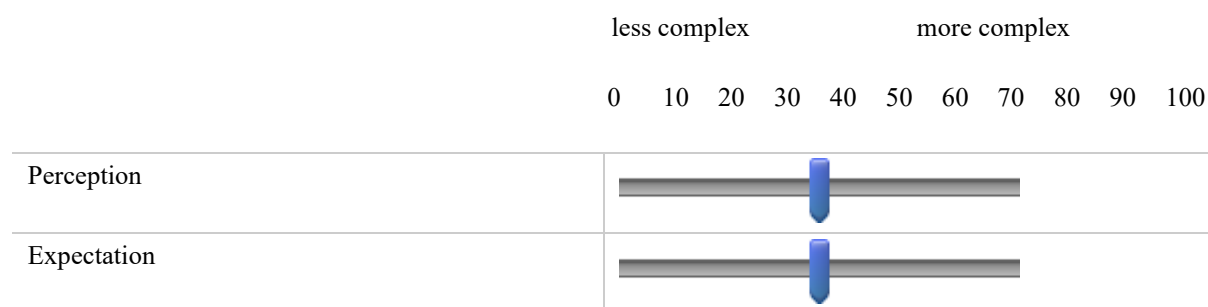
Q4.2

How complex do you perceive and expect the "Tax Framework" in general:

*"Tax framework complexity" describes the complexity that arises from the legislative and administrative processes and features within a tax system and is measured in five dimensions: guidance, enactment, payment and filing, audits, and objection and appeals.*

*Perception means how you perceive tax complexity in reality.*

*Expectation means how you want the tax complexity to be in the future.*

|  | less complex      more complex |
|---|---|
|  | 0   10   20   30   40   50   60   70   80   90   100 |
| Perception |  |
| Expectation |  |
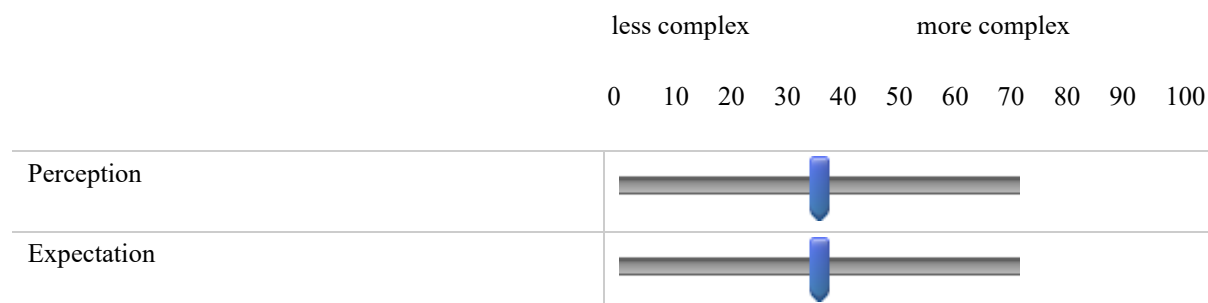
Q4.3

How strongly do you agree with the following statements about tax complexity?

| | Strongly disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Strongly agree |
|---|---|---|---|---|---|
| Tax complexity has increased over the last 5 years. | o | o | o | o | o |
| Tax complexity will lead to additional efforts in tax administration in the upcoming years. | o | o | o | o | o |
| Tax complexity will lead to additional efforts in tax compliance in the upcoming years. | o | o | o | o | o |
| Tax complexity is increased by growing cross-border economic activities. | o | o | o | o | o |
| Tax complexity is increased by growing digital business models. | o | o | o | o | o |

Q4.4
Does tax complexity harm your institution?

o   Never

o   Rarely

o   Sometimes

o   Often

o   Always

Q4.5
How does tax complexity harm your institution?
(Check all answers that apply)

☐   Decline in payment compliance

☐   Decline in administrative compliance

☐   Increase in tax administration cost

☐   More tax risk

☐   More disputes

☐   Other (please mention) _____

Q4.6
How does tax complexity harm your company?
(Check all answers that apply)

☐   Increase in tax expense

☐   Increase in tax compliance cost

☐   More tax risk

☐   More disputes

☐   Other (please mention) _____

Q4.7
Does your institution also benefit from tax complexity?

o  Never

o  Rarely

o  Sometimes

o  Often

o  Always

Q4.8
How does your institution benefit from tax complexity?
(Check all answers that apply)

☐  Enhanced payment compliance

☐  Enhanced administrative compliance

☐  Less tax risk

☐  Fewer disputes

☐  Other (please mention) _____

Q4.9
How does your company benefit from tax complexity?
(Check all answers that apply)

☐  Enhanced payment compliance

☐  Enhanced administrative compliance

☐  More/better tax planning opportunities

☐  Less tax risk

☐  Fewer disputes

☐  Other (please mention) _____

Q4.10
What should the government do to fight tax complexity?
(Check all answers that apply)

☐  enacting principle-based instead of rule-based regulations

☐  enhancing cooperation between the tax authority and taxpayers

☐  optimization of the use of information technology

☐  other (please mention) _____

**End of Block: General Perception and Perspective on Tax Complexity**

Q5.1

What is your current position?

o   Echelon Officer/Management

o   Account Representative

o   Tax Objection/Appeal Reviewer

o   Tax Auditor

o   Other Administrative Staff

o   Other (please mention) _____

Q5.2

What is the main focus of your work?

o   Tax revenue collection

o   Taxpayers service

o   Tax disputes

o   Tax regulation

o   Information infrastructure

o   Public relations

o   General management

o   Other (please mention) _____

Q5.3

In which type of office do you work?

o   Head Office

o   Regional Office

o   Large/Special Taxpayers Office

o   Medium Taxpayers Tax Office

o   Small Taxpayers Tax Office

o   Other (please mention) _____

Q6.1
What is your current position in your company?

o   Director/Partner/Principal

o   Manager/Senior Staff

o   Junior Assistant/Staff

o   Other (please mention) _____

Q6.2
By which type of Tax Office is your company administered?

o   Large/Special Taxpayers Tax Office

o   Medium Taxpayers Tax Office

o   Small Taxpayers Tax Office

Q7.1

How long have you been working in taxation?

o   15 years or more

o   10 years or more but fewer than 15 years

o   5 years or more but fewer than 10 years

o   Fewer than 5 years

Q7.2

What is your highest educational qualification?

o   Doctoral or equivalent level

o   Master or equivalent level

o   Bachelor or equivalent level

o   Diploma III

o   Diploma I or II

o   Other (please mention) _____

Q7.3

What was your field of education?

o   Business and administration

o   Law

o   Fiscal Policy

o   Other (please mention) _____

Q7.4

Please specify your gender.

o   Male

o   Female

o   Prefer not to answer

**Appendix 3: Survey Distribution Channels**

| No | Type | Unit Echelon II (Directorate/ Regional Offices) |
|---|---|---|
| 1 | Head Office | Directorate of Tax Regulation I |
| 2 | Head Office | Directorate of Tax Regulation II |
| 3 | Head Office | Directorate of Objection and Appeal |
| 4 | Head Office | Directorate of Audit and Collection |
| 5 | Head Office | Directorate of Public Relations |
| 6 | Head Office | Directorate of Potential, Compliance, and Revenue |
| 7 | Regional Office | Large Taxpayers |
| 8 | Regional Office | Special Taxpayers |
| 9 | Regional Office | Central Jakarta |
| 10 | Regional Office | South Jakarta I |
| 11 | Regional Office | East Jakarta |
| 12 | Regional Office | North Jakarta |
| 13 | Regional Office | Aceh |
| 14 | Regional Office | North Sumatra I |
| 15 | Regional Office | North Sumatra II |
| 16 | Regional Office | Riau |
| 17 | Regional Office | West Sumatra and Jambi |
| 18 | Regional Office | South Sumatra and Bangka Belitung Islands |
| 19 | Regional Office | Bengkulu and Lampung |
| 20 | Regional Office | Banten |
| 21 | Regional Office | West Java I |
| 22 | Regional Office | Central Java I |
| 23 | Regional Office | Yogyakarta Special Region |
| 24 | Regional Office | East Java I |
| 25 | Regional Office | Bali |
| 26 | Regional Office | Nusa Tenggara |
| 27 | Regional Office | North Sulawesi, Central Sulawesi, Gorontalo, and North Maluku |
| 28 | Tax Application Service Provider | PT Mitra Pajakku |

Notes: The table enumerates the survey distribution channels. The channels are 27 Echelon II units of the DGT and 1 tax application service provider. Within the DGT, there are 6 directorates located at the DGT head office, 2 large and special regional offices which administer the large and special (e.g., foreign direct investment, permanent establishment, oil, and gas companies) taxpayers, and 21 geographical type regional offices which administer medium and small taxpayers.

**Appendix 4: The Survey Coverage Area**
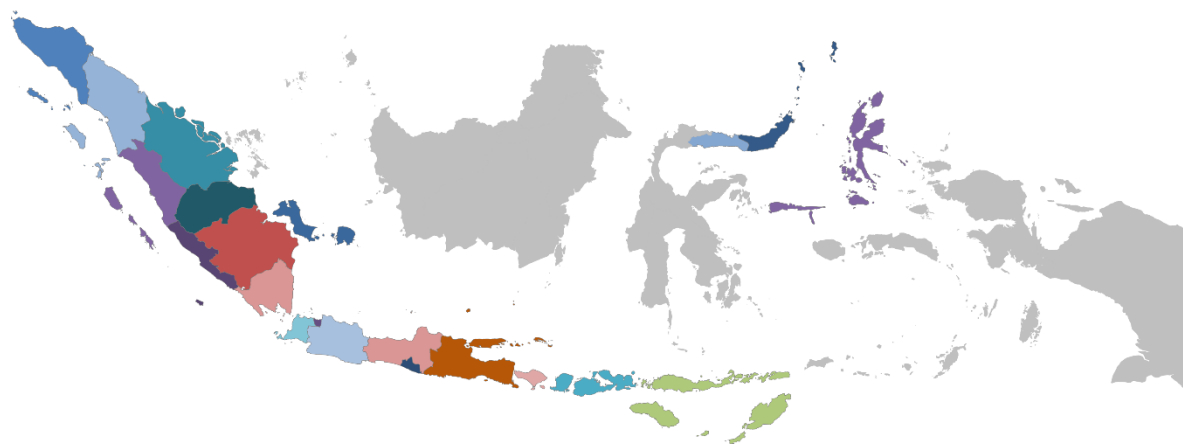
Notes: The figure illustrates the coverage area of our survey, involving a network of 27 Echelon II units of the DGT. Our survey covers all geographical areas of Indonesia. Within this network, there are 6 directorates located at the DGT head office, 2 large and special regional offices serving the national level largest and special taxpayers, and 21 geographical type regional offices administering medium and small-scale taxpayers in specific-colored areas. Additionally, we collaborate with a tax application service provider to facilitate outreach to taxpayers.

# Appendix 5: Drivers of Tax Complexity

Panel A: Drivers of Tax Code Complexity

| No | Regulations | # | Complexity driver | N | Mean | s.d. | Min | Max |
|---|---|---|---|---|---|---|---|---|
| (1) | Capital Gains/Losses | (1) | Ambiguity & Interpretation | 391 | 0.730 | 0.213 | 0 | 1 |
| | | (2) | Change | 391 | 0.704 | 0.220 | 0 | 1 |
| | | (3) | Computation | 391 | 0.745 | 0.211 | 0 | 1 |
| | | (4) | Detail | 391 | 0.730 | 0.218 | 0 | 1 |
| | | (5) | Record Keeping | 391 | 0.760 | 0.208 | 0 | 1 |
| (2) | Corporate Reorganization | (1) | Ambiguity & Interpretation | 391 | 0.700 | 0.227 | 0 | 1 |
| | | (2) | Change | 391 | 0.678 | 0.230 | 0 | 1 |
| | | (3) | Computation | 391 | 0.684 | 0.239 | 0 | 1 |
| | | (4) | Detail | 391 | 0.693 | 0.232 | 0 | 1 |
| | | (5) | Record Keeping | 391 | 0.719 | 0.234 | 0 | 1 |
| (3) | Depreciation & Amortization | (1) | Ambiguity & Interpretation | 391 | 0.721 | 0.217 | 0 | 1 |
| | | (2) | Change | 391 | 0.696 | 0.227 | 0 | 1 |
| | | (3) | Computation | 391 | 0.728 | 0.214 | 0 | 1 |
| | | (4) | Detail | 391 | 0.719 | 0.216 | 0 | 1 |
| | | (5) | Record Keeping | 391 | 0.735 | 0.222 | 0 | 1 |
| (4) | Investment Incentives | (1) | Ambiguity & Interpretation | 391 | 0.702 | 0.223 | 0 | 1 |
| | | (2) | Change | 391 | 0.697 | 0.219 | 0 | 1 |
| | | (3) | Computation | 391 | 0.715 | 0.219 | 0 | 1 |
| | | (4) | Detail | 391 | 0.709 | 0.211 | 0 | 1 |
| | | (5) | Record Keeping | 391 | 0.724 | 0.221 | 0 | 1 |
| (5) | Statutory Tax Rate | (1) | Ambiguity & Interpretation | 391 | 0.756 | 0.232 | 0 | 1 |
| | | (2) | Change | 391 | 0.745 | 0.217 | 0 | 1 |
| | | (3) | Computation | 391 | 0.769 | 0.215 | 0 | 1 |
| | | (4) | Detail | 391 | 0.760 | 0.207 | 0 | 1 |
| | | (5) | Record Keeping | 391 | 0.738 | 0.237 | 0 | 1 |
| (6) | Loss Offset | (1) | Ambiguity & Interpretation | 391 | 0.732 | 0.231 | 0 | 1 |
| | | (2) | Change | 391 | 0.699 | 0.223 | 0 | 1 |
| | | (3) | Computation | 391 | 0.740 | 0.216 | 0 | 1 |
| | | (4) | Detail | 391 | 0.728 | 0.214 | 0 | 1 |
| | | (5) | Record Keeping | 391 | 0.747 | 0.217 | 0 | 1 |
| (7) | Royalties | (1) | Ambiguity & Interpretation | 391 | 0.741 | 0.216 | 0 | 1 |
| | | (2) | Change | 391 | 0.715 | 0.214 | 0 | 1 |
| | | (3) | Computation | 391 | 0.731 | 0.215 | 0 | 1 |
| | | (4) | Detail | 391 | 0.730 | 0.213 | 0 | 1 |
| | | (5) | Record Keeping | 391 | 0.741 | 0.218 | 0 | 1 |
| (8) | Dividends | (1) | Ambiguity & Interpretation | 391 | 0.752 | 0.217 | 0 | 1 |
| | | (2) | Change | 391 | 0.723 | 0.207 | 0 | 1 |
| | | (3) | Computation | 391 | 0.740 | 0.211 | 0 | 1 |
| | | (4) | Detail | 391 | 0.735 | 0.213 | 0 | 1 |
| | | (5) | Record Keeping | 391 | 0.743 | 0.217 | 0 | 1 |
| (9) | Interest | (1) | Ambiguity & Interpretation | 391 | 0.745 | 0.213 | 0 | 1 |
| | | (2) | Change | 391 | 0.711 | 0.213 | 0 | 1 |
| | | (3) | Computation | 391 | 0.735 | 0.210 | 0 | 1 |
| | | (4) | Detail | 391 | 0.736 | 0.208 | 0 | 1 |
| | | (5) | Record Keeping | 391 | 0.737 | 0.224 | 0 | 1 |
| (10) | Transfer Pricing | (1) | Ambiguity & Interpretation | 391 | 0.801 | 0.204 | 0 | 1 |
| | | (2) | Change | 391 | 0.763 | 0.200 | 0 | 1 |
| | | (3) | Computation | 391 | 0.783 | 0.194 | 0 | 1 |
| | | (4) | Detail | 391 | 0.782 | 0.189 | 0 | 1 |
| | | (5) | Record Keeping | 391 | 0.808 | 0.189 | 0 | 1 |
| (11) | Permanent Establishment | (1) | Ambiguity & Interpretation | 391 | 0.743 | 0.216 | 0 | 1 |
| | | (2) | Change | 391 | 0.707 | 0.221 | 0 | 1 |
| | | (3) | Computation | 391 | 0.726 | 0.211 | 0 | 1 |
| | | (4) | Detail | 391 | 0.742 | 0.207 | 0 | 1 |
| | | (5) | Record Keeping | 391 | 0.747 | 0.212 | 0 | 1 |

Panel B: Drivers of Tax Framework Complexity

| No | Procedures | # | Complexity driver | N | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|---|---|---|
| (1) | Tax Guidance | (1) | Public rulings | 391 | 0.221 | 0.201 | 0 | 1 |
| | | (2) | Private rulings | 391 | 0.311 | 0.232 | 0 | 1 |
| | | (3) | Oral or written advice | 391 | 0.313 | 0.231 | 0 | 1 |
| | | (4) | Substantial business issues | 391 | 0.107 | 0.310 | 0 | 1 |
| | | (5) | Soft law | 391 | 0.410 | 0.227 | 0 | 1 |
| (2) | Tax Law Enactment | (1) | Access to enacted tax legislation | 391 | 0.223 | 0.416 | 0 | 1 |
| | | (2) | Influence of third parties | 391 | 0.570 | 0.496 | 0 | 1 |
| | | (3) | Quality of drafting | 391 | 0.340 | 0.474 | 0 | 1 |
| | | (4) | Time at which legislation becomes effective | 391 | 0.358 | 0.480 | 0 | 1 |
| | | (5) | Time between the announcement and enactment of tax changes | 391 | 0.368 | 0.483 | 0 | 1 |
| | | (6) | Participation in legislative process | 391 | 0.799 | 0.269 | 0 | 1 |
| (3) | Tax Filing & Payment | (1) | Computing tax payments | 391 | 0.583 | 0.494 | 0 | 1 |
| | | (2) | Determining due dates for tax payments | 391 | 0.100 | 0.300 | 0 | 1 |
| | | (3) | Refunding overpaid corporate income taxes | 391 | 0.335 | 0.473 | 0 | 1 |
| | | (4) | (Electronic remittance of tax payments | 391 | 0.113 | 0.316 | 0 | 1 |
| | | (5) | Determining due dates for filing tax returns | 391 | 0.074 | 0.262 | 0 | 1 |
| | | (6) | Managing the number of tax returns during a year | 391 | 0.225 | 0.418 | 0 | 1 |
| | | (7) | Preparing tax returns | 391 | 0.425 | 0.495 | 0 | 1 |
| | | (8) | (Electronic) transmission of tax returns | 391 | 0.343 | 0.475 | 0 | 1 |
| | | (9) | Instructions for filing tax returns | 389 | 0.141 | 0.202 | 0 | 1 |
| (4) | Tax Audits | (1) | Outline of tax audit process | 391 | 0.228 | 0.228 | 0 | 1 |
| | | (2) | Tax audit cycle | 391 | 0.274 | 0.446 | 0 | 1 |
| | | (3) | Notification of the upcoming tax audit | 391 | 0.097 | 0.297 | 0 | 1 |
| | | (4) | Disclosure of selection criteria for tax audit target | 391 | 0.309 | 0.463 | 0 | 1 |
| | | (5) | Communication of topics to be covered by the tax audit | 391 | 0.253 | 0.435 | 0 | 1 |
| | | (6) | Decisions by tax officers | 391 | 0.381 | 0.486 | 0 | 1 |
| | | (7) | Sanctions imposed in case of violations | 391 | 0.217 | 0.413 | 0 | 1 |
| | | (8) | Experience or technical skill of tax officers | 391 | 0.345 | 0.476 | 0 | 1 |
| | | (9) | Behavior by tax officers | 391 | 0.156 | 0.363 | 0 | 1 |
| (5) | Tax Appeals | (1) | Outline of tax objection process | 391 | 0.213 | 0.223 | 0 | 1 |
| | | (2) | Outline of tax appeal process | 391 | 0.226 | 0.228 | 0 | 1 |
| | | (3) | Decisions by tax officers in tax objections | 391 | 0.325 | 0.469 | 0 | 1 |
| | | (4) | Influence of third parties in tax objections | 391 | 0.202 | 0.402 | 0 | 1 |
| | | (5) | Agents/staff in tax objections | 391 | 0.258 | 0.438 | 0 | 1 |
| | | (6) | Completion time in tax objections | 391 | 0.169 | 0.375 | 0 | 1 |
| | | (7) | Decisions by tax officers in tax appeals | 391 | 0.427 | 0.495 | 0 | 1 |
| | | (8) | Influence of third parties in tax appeals | 391 | 0.348 | 0.477 | 0 | 1 |
| | | (9) | Agents/staff in tax appeals | 391 | 0.233 | 0.423 | 0 | 1 |
| | | (10) | Completion time in tax appeals | 391 | 0.332 | 0.472 | 0 | 1 |

Notes: The table presents the descriptive statistics of the drivers of tax complexity based on tax officers' assessment. Panels A and B report the statistics of the tax regulation and procedure drivers, respectively.

## Appendix 6: Pairwise Correlations

Panel A: Correlations among the dimensions of tax code complexity

| Regulations | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Capital gains/losses | 1.000 | | | | | | | | | | |
| (2) Corporate reorganization | 0.739* | 1.000 | | | | | | | | | |
| (3) Depreciation | 0.863* | 0.710* | 1.000 | | | | | | | | |
| (4) Investment incentives | 0.753* | 0.743* | 0.797* | 1.000 | | | | | | | |
| (5) Statutory tax rate | 0.766* | 0.575* | 0.802* | 0.730* | 1.000 | | | | | | |
| (6) Loss offset | 0.847* | 0.628* | 0.884* | 0.794* | 0.860* | 1.000 | | | | | |
| (7) Royalties | 0.825* | 0.668* | 0.831* | 0.760* | 0.757* | 0.839* | 1.000 | | | | |
| (8) Dividends | 0.819* | 0.675* | 0.842* | 0.754* | 0.776* | 0.835* | 0.959* | 1.000 | | | |
| (9) Interest | 0.830* | 0.682* | 0.843* | 0.751* | 0.769* | 0.833* | 0.955* | 0.965* | 1.000 | | |
| (10) Transfer pricing | 0.763* | 0.606* | 0.740* | 0.688* | 0.675* | 0.719* | 0.777* | 0.794* | 0.779* | 1.000 | |
| (11) Permanent establishment | 0.789* | 0.701* | 0.736* | 0.705* | 0.677* | 0.758* | 0.835* | 0.824* | 0.825* | 0.777* | 1.000 |

*$p<0.05$

Panel B: Correlations among Tax Complexity Drivers of Regulations

| Drivers | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| (1) Ambiguity & interpretation | 1.000 | | | | |
| (2) Change | 0.740* | 1.000 | | | |
| (3) Computation | 0.677* | 0.745* | 1.000 | | |
| (4) Detail | 0.719* | 0.729* | 0.794* | 1.000 | |
| (5) Record keeping | 0.654* | 0.677* | 0.698* | 0.770* | 1.000 |

*$p<0.05$

Panel C: Correlations among the Dimensions of Tax Framework Complexity

| Procedures | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| (1) Tax guidance | 1.000 | | | | |
| (2) Tax law enactment | 0.098 | 1.000 | | | |
| (3) Tax filing & payment | 0.085 | 0.494* | 1.000 | | |
| (4) Tax audits | 0.172* | 0.430* | 0.520* | 1.000 | |
| (5) Tax appeals | 0.176* | 0.269* | 0.329* | 0.512* | 1.000 |
| * $p<0.05$ | | | | | |

Notes: Panel A reports the correlation matrix of the dimensions in the tax regulation complexity. Panel B shows the correlation coefficients of the complexity drivers of tax regulations Panel C shows the correlations among the dimensions of tax procedure complexity.

# (B) The Downsides of Democracy? –
# The Case of Tax Complexity[*]

**Henning Giese**
Paderborn University
KU Research Institute for Taxation
henning.giese@upb.de

**Adrian Schipp**
Paderborn University
adrian.schipp@upb.de

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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

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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.

as its sub-indices Tax Code Complexity (*TaxCodeComplexity*) and Tax Framework Complexity (*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 ($\mu$) 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. More-

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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.

over, 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-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.

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

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]

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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/).

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 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 world-

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[23] By using various matching techniques and parameters, along with unmatched regression results, we adhere the concern of Leamer (1983) that findings may be influenced by a specific research design. Using all variables as matching and control variables leads to double-robust specifications (Słoczyński and Wooldridge (2018)).
[24] See https://www.taxcomplexity.org/.

wide. 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 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

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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/.

rankings, the Status Index and the Governance Index, both based on in-depth assessments of 137 coun-tries.[29] Second, we incorporate data from the Polity IV Project described by Marshall, Gurr, and Jaggers (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 ana-lyzing their party manifestos. The provided Manifesto Project Dataset for examining the policy prefer-ences 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' eco-nomic status (*GDP*, *GDPpercapita*, *Inflation*, *Population*, and *Unemployment Rate*). Moreover, we ac-count 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 in-fluence 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 dis-continued the Paying Taxes study after the data for 2019 had been published. To keep our sample bal-

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[29] See https://bti-project.org/en/?&cb=00000.
[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.

anced, we impute the 2019 data for 2020. Moreover, missing data for the control variables *Unemploy-ment 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.

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*, *TaxCo-deComplexity*, 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]

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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.

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 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]

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

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 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*

- 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

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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**
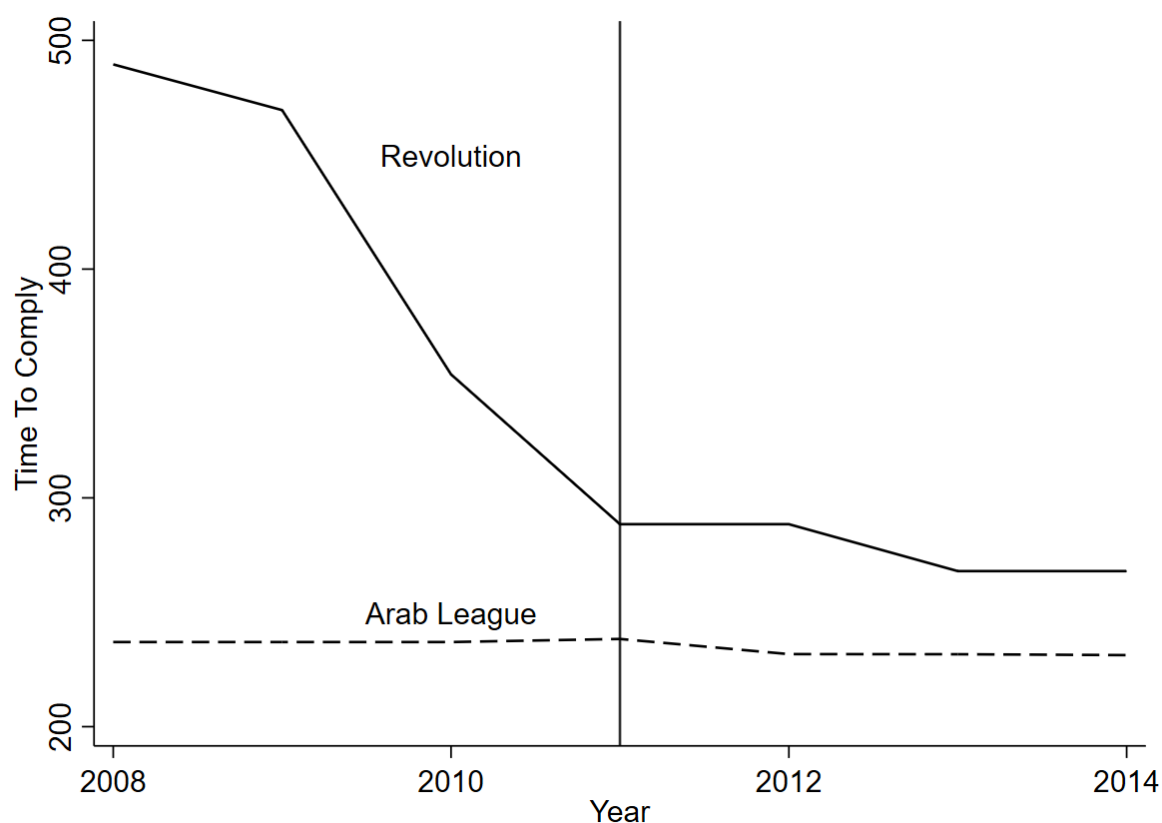


Notes: This figure presents the complexity trends before and after the exogenous shock of the Arab Spring 2011. Complexity is measured by the variables *TimeToComply* (Time to Comply). The solid line reflects the *TimeToComply* values for the treatment group (*arab_spring_revolution*), whereas the dashed 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**
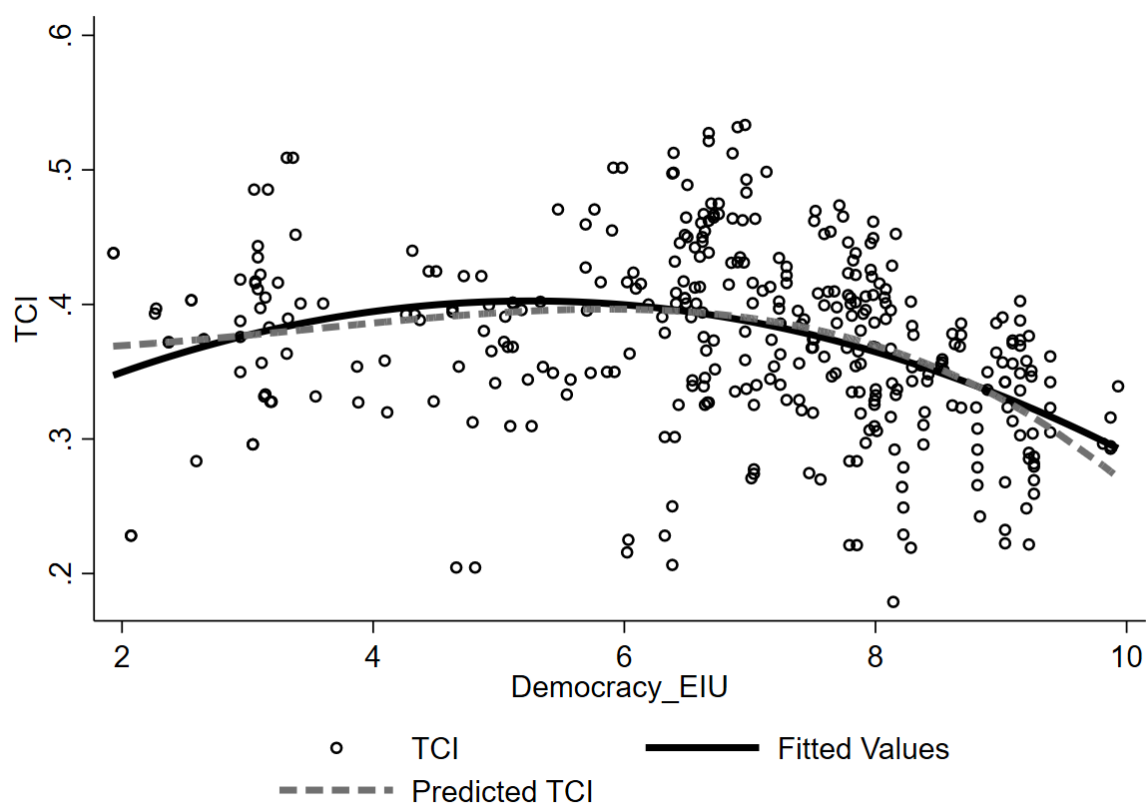


Notes: This figure presents the distribution of the 362 observations of Democracy (*Democracy_EIU*) of the sample by the respective Tax Complexity Index values. The hollow circles reflect the actual observation values. The solid black line represents a fitted reversed U-shaped line. The dashed grey line 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)<br>*TaxCode<br>Complexity* | (2)<br>*TaxFramework<br>Complexity* | (3)<br>*TaxCode<br>Complexity* | (4)<br>*TaxFramework<br>Complexity* | (5)<br>*TaxCode<br>Complexity* | (6)<br>*TaxFramework<br>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 | -29.7402* | | | | |
| | [-1.53] | [-1.91] | | | | |
| Low Democracy | | | -0.0297*** | -114.1248*** | | |
| | | | [-3.17] | [-2.61] | | |
| Moderate Democracy | | | | | 0.0294*** | 89.6065*** |
| | | | | | [3.92] | [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)<br>*TimeToComply* | (2)<br>*TimeToComply* | (3)<br>*TimeToComply* | (4)<br>*TimeToComply* | (5)<br>*TimeToComply* | (6)<br>*TimeToComply* |
| *arab_spring* | 8.3549<br>[1.39] | | | | | |
| *arab_spring_reform* | | 15.6816***<br>[2.68] | | | | |
| *arab_spring_revolution* | | | 25.0440***<br>[2.81] | 13.8238<br>[1.47] | 28.0810**<br>[2.38] | 28.1042**<br>[2.38] |
| *post_arab_spring* | -4.5194<br>[-0.14] | -9.0698<br>[-0.33] | 15.5810<br>[0.56] | 9.4558<br>[0.17] | 17.3930<br>[0.23] | 6.8721<br>[0.09] |
| ***treated_post*** | **-4.3400**<br>**[-0.55]** | **-6.5948**<br>**[-0.82]** | **-19.9660***<br>**[-1.95]** | **-15.9550**<br>**[-1.48]** | **-29.6771****<br>**[-2.28]** | **-30.3671****<br>**[-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.

# (C) Too Complex to Cooperate? -
# Tax Complexity and Cooperative Compliance[*]

**Adrian Schipp**
Paderborn University
adrian.schipp@upb.de

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**Abstract**

This study investigates whether, how, and under what conditions the expected positive association between cooperative compliance programs and tax compliance is attenuated by tax complexity. Many countries have implemented cooperative compliance programs to improve compliance, however, the effectiveness of these programs varies across countries. I expect and find that the complexity of a country's tax system might impair the compliance-enhancing impact of cooperative compliance programs. Using cross-country data of 57 countries, I find that cooperative compliance programs generally promote compliance, except in countries with highly complex tax codes. Moreover, these programs are positively associated with tax compliance even if tax procedures, such as tax filing and payment or tax audits, are highly complex. My findings suggest that cooperative compliance programs can compensate for mistrust caused by complex tax procedures and enhance compliance. However, they may not be effective tools to enhance compliance in complex tax codes.

**Keywords:** tax complexity; cooperative compliance; tax compliance
**JEL Classification:** C33; G28; H20; H25, H26; K34

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# 1   Introduction

This study investigates whether, how and under what conditions tax complexity can jeopardize the effectiveness of cooperative compliance programs (CCPs) to improve compliance. CCPs, introduced by tax administrations, build on cooperation with taxpayers rather than deterrence and are recommended by multinational organizations to fight tax uncertainty and enhance compliance (OECD (2013), International Chamber of Commerce (2019)). Therefore, the introduction of a cooperative compliance program is a signal from the tax authority to the taxpayers of its intention to follow a cooperative approach and jointly searching for solutions in tax conflicts. However, CCPs do not always seem to enhance compliance (Larsen (2019)). This study investigates how differences in tax systems, particularly in tax complexity might impair this compliance-enhancing potential of CCPs.

Several countries have introduced such programs to improve tax administration-taxpayer cooperation. A prominent example is the "horizontal monitoring within the medium to very large businesses segment" in the Netherlands (The Netherlands Tax and Customs Administration (2010)), which has been implemented in 2005. It was one of the first programs implementing the idea of an eyes-sight relation between the authority and, at least some, taxpayers. A number of countries, like the United Kingdom (2015) or Austria (2019), followed this approach and implemented similar programs in the recent past. Survey evaluations show that tax administrators and taxpayers generally appreciate CCPs in the United Kingdom (Oats and Widt (2019)) and Austria (Enachescu et al. (2019)) and perceive increased trust between taxpayers and tax authorities. However, not all CCPs are met with acceptance. E.g., the Swedish fördjupad dialog ("in-depth dialogue") was not accepted by taxpayers as they perceived the introduction of the CCP as an unnecessary addition to the previously already trustful relationship. Therefore, the additional shift in trust through the introduction of the CCP has been perceived as superfluous and actually arouse mistrust and therefore the CCP ultimately was not successful (Larsen (2019)).

The slippery slope framework (Kirchler, Hoelzl, and Wahl (2008)) provides a theoretical basis for this study. The slippery slope model indicates that compliance (voluntary or ensured) by taxpayers can be established via two channels: trust in the tax authorities and power of the tax authorities. Trust is defined as the perception of individuals and social groups that the tax authorities are benevolent and

work beneficially.[1] However, if a tax system is very complex, trust may be violated (Kirchler, Hoelzl, and Wahl (2008)). Power is defined as to what extent a tax authority is able to enforce compliance, e.g., use of targeted audits, increase the audit probability, detect tax evasion etc.[2] Also the power might depend on the complexity of the tax system, e.g., on the complexity of tax filing and payment procedures or audits that ultimately shape the effectiveness of tax enforcement. Cooperative compliance programs rather build on the idea of trust (cooperation) than on power to establish higher levels of compliance. These programs are designed to change the relation between tax authorities and taxpayers in a trustful manner. Besides increasing trust, e.g., through increased and timelier submission of relevant documentation by the taxpayer and timelier decision processes in the authorities, the power dimension in the slippery slope framework is also affected. If the authorities receive relevant information earlier and, depending on the design of the cooperative compliance program, more frequently, they are in a better position to detect fraud and will be perceived as more powerful.[3] Taken together, the slippery slope framework predicts an increase in tax compliance through cooperation. Moreover, the implementation of a CCP is a signal from the tax authorities to all eligible taxpayers for a trustful environment. The perception of a trustful environment might even spillover to companies that are not part of the CCP.[4] Introducing a CCP is expected to increase trust in the sense of the slippery slope framework. Consistently, CCPs are expected to positively affect tax compliance. However, both dimensions, trust and power, might be affected by the complexity of the tax system.

Noticeably, tax systems tend to become more complex in the recent past (Hoppe et al. (2023)). Anecdotal and survey evidence indicates that complexity in the tax system is substantial and points

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[1] Falsetta, Schafer, and Tsakumis (2024) support the notion that trust in institutions increasing taxpayer compliance by finding in an experimental study that taxpayers are likely to be more compliant if they support governmental spending.

[2] See Kirchler, Hoelzl, and Wahl (2008), p. 212.

[3] Simone, Sansing, and Seidman (2013) state that enhanced relationships between tax authorities and taxpayers increase the ability of tax authorities to detect uncertain tax positions. Survey results by King (2024) show increased tax compliance by imposing appropriately severe non-compliance penalties.

[4] In a theoretical experiment, Engl, Riedl, and Weber (2021) indicate a positive spillover effect of prosocial institutions, such as cooperative compliance programs, on not affected agents. In fact, Bauckloh et al. (2021) show significant evidence for spillover effects of tax avoidance on peers′ firm value, indicating similar tax compliance patterns in peer groups. Moreover, Müller and Weinrich (2020) document tax knowledge diffusions via strategic alliances, Cen et al. (2018) state tax knowledge diffusion along the supply chain and Brown and Drake (2014) find network effects on compliance behavior, e.g., through board interlocks or shared auditors. In an experimental study, Fochmann, Müller, and Overesch (2021) show that trustful signals from the tax authority, in their case a correctly pre-filled tax return, lead to increased compliance behavior by taxpayers.

towards tax complexity might obstruct tax compliance (Milliron (1985), Saad (2014), Ulph (2015)). Moreover, recent survey evidence about tax complexity shows tax authorities and taxpayers being concerned about the reliability and effectiveness of the tax audit process. Taxpayers perceive major problems in the complexity of the tax audit process visible in inconsistent decisions by tax auditors (Hoppe et al. (2020)). Tax experts in German tax administrations are concerned about both the complexity in the documentation and cooperation of taxpayers in the audit process (Bornemann, Schipp, and Sureth-Sloane (2021)). These observations also can be translated to the slippery slope framework. In the slippery slope model, complexity in the tax system influences both trust and power. Trust is positively associated with "subjective tax knowledge" (Kirchler, Hoelzl, and Wahl (2008)) by taxpayers. Due to complexity in the tax system, it is costlier for taxpayers to acquire the required tax knowledge and therefore trust is expected to decrease in tax complexity. But complexity not only influences the taxpayers' cost for gaining knowledge, also it challenges tax auditors to effectively conduct tax audits and to detect fraud, because in a more complex system taxpayers might use more sophisticated paths for being non-compliant. The slippery slope framework suggests that a decrease in the power of the tax authorities taxpayers can more easily use loopholes in the tax system and hide non-compliance.[5] In line with this notion, the majority of prior literature provides evidence that higher levels of tax complexity are expected to be associated with higher levels of non-compliance (Milliron (1985), Saad (2014), Ulph (2015)).[6] However, if tax complexity is seen as a severe threat to trust (and power), the introduction of the CCP might not be able to compensate for it and, thus, ultimately fail to enhance compliance. Therefore, I interact the two seemingly distinct constructs CCP and tax complexity to shed light on possible inferences in associations regarding tax compliance.

I am the first to exploit data on tax complexity to investigate the potentially attenuating interplay of tax complexity the compliance-enhancement of CCPs in a cross-country setting.[7] Through empirical analyses, primarily using data from the Global MNC Tax Complexity Survey[8] and the ISORA

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[5] See Kirchler, Hoelzl, and Wahl (2008), p. 217.

[6] A very limited number of studies propose high levels of complexity to be associated with higher tax compliance. See Beck, Davis, and Jung (1991) and Cuccia and Carnes (2001).

[7] Siglé et al. (2022) conduct a study relying on survey and audit data form the Netherlands, but their study does not take tax complexity into account and is only limited to the Netherlands, while this study is a cross-country investigation.

[8] See https://taxcomplexity.org.

(International Survey on Revenue Administration) database[9], this study establishes a basis for subsequent tax compliance analyses. I contribute to the literature in three ways: First, I add to the sparse literature on the outcome of cooperative compliance programs by showing substantial insights on the association of cooperative compliance programs and tax compliance. Second, I deliver new insights on the association between tax complexity and tax compliance in a cross-country setting. Third, using the Tax Complexity Index by Hoppe et al. (2023) allows me to distinguish between different kinds of tax complexity and investigate potential differences in their interaction with CCPs and the resulting association on tax compliance. The results show significant evidence for the signaling effect of cooperative compliance programs not being present in countries with highly complex tax codes but in countries with highly complex tax frameworks. Countries with a CCP in place and indicating a high level of tax framework complexity appear to have a 4.83 % lower value for non-compliance. Contrastingly, countries with a highly complex tax code having a CCP in place indicate 4.73 % more non-compliance. To test the robustness of these results, I conduct single country studies with firm-level data in Austria and Italy. Both countries offer CCPs to firms meeting certain requirements. I investigate Austria and Italy, because Italy is a high tax complex country, especially in terms of tax code complexity. I find evidence, that tax code complexity is negatively associated with the compliance enhancement of CCPs. Austria is a low to moderate tax complex country. The results of these firm-level studies underline the results of the country-level investigations. Firms in Austria show significantly more tax compliance when the country offers a CCP. CCP-eligible firms indicate a 3.39 (5.92) percentage points higher GAAP (Cash) ETRs and 3.37 percentage point lower non-compliance. I do not find statistically significant coefficients in the investigations of the CCP-eligible firms in Italy, indicating that the expected positive influence of the CCP on tax compliance may be vanished by tax code complexity.

The study is structured as follows: Section 2 presents the theoretical background of cooperative compliance programs, their aim of increasing tax compliance and the construct of tax complexity. Based on the predictions of the slippery slope framework, section 3 develops the hypotheses of this study. section 4 describes the research design and section 5 the data. In sections 6 and 7 I present the main

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[9] See https://data.rafit.org.

results of the country-level data and the robustness checks with firm data from Compustat. Section 8 concludes.

## 2   Theoretical and institutional background

In the recent past, cooperative compliance programs have been implemented in many different countries and many different facets. Supranational organizations like the OECD or the ICC (International Chamber of Commerce) presented guidelines and frameworks for encouraging countries to implement CCPs (OECD (2013), International Chamber of Commerce (2019)). CCPs, in the sense of the OECD and the ICC, can be beneficial for both tax authorities and taxpayers.[10] Tax authorities can use resources more efficiently and reach higher compliance levels in their country. Taxpayers can achieve legal certainty ex ante when engaging in CCPs (Goslinga et al. (2021)). Taken together, the inherent aim of CCPs is to improve tax compliance.[11] Moreover, by implementing a framework of trust and confidence surrounding taxpayers and tax administrations, CCPs have the potential to increase the effectiveness and efficiency of taxation (OECD (2013)). The implementation of a CCP can be seen as a signal of the tax authorities to the taxpayers to be interested in a trustful relationship. In most countries, companies can only participate in CCPs if they meet certain requirements in terms of firm size and, moreover, the companies have the opportunity to decide if they want to participate in the program or not. Nonetheless, the signal of the implementation of a CCP has an influence on all eligible taxpayers in the country because the tax authorities will be perceived as more trustworthy.

A number of countries implemented CCPs, primarily targeting medium-sized to large corporate taxpayers or High-Net-Worth-Individuals (HNWI), in various forms. Notably, one of the first and most discussed CCPs is the Dutch horizontal monitoring model (Colon (2017), Widt and Oats (2017), Huiskers-Stoop and Gribnau (2019)). The Netherlands implemented their horizontal monitoring model in

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[10] I do not include International Compliance Assurance Programs (ICAP) into to scope of this study, since these are multinational tools. So, these programs are not only designed by and for single countries. The signaling effect of the implementation of these programs will differ from CCPs in the sense of this study. In this study I focus on single-country cooperative compliance programs and rely on the data of the ISORA database to define if a country provides a CCP or not.

[11] In this study, I follow Alm (1991) and define tax compliance as reporting all income and paying all taxes in accordance with applicable laws, regulations, and court decisions.

2005 and after some initial problems (Widt (2017)) the program exists until today.[12] For engaging in the Dutch horizontal monitoring, seven steps have to be undertaken (The Netherlands Tax and Customs Administration (2010)). As a first step, a detailed profile of the taxpayer is made ("up-to-date client profile") to capture the current economic situation of the taxpayer. Depending on who takes the initiative for entering the horizontal monitoring, the profile can be created either by the tax administration or by the taxpayer itself. In the next steps, both sides figure out if horizontal monitoring is feasible or not. The first horizontal monitoring meeting takes place, and a compliance scan of the taxpayer is generated. Additionally, in the next step, pending tax issues must be solved. The first four steps must be seen as a mutual information exchange, in which the taxpayer and the administration gather information and figure out if engaging in horizontal monitoring is desirable and auspicious or not. Building on the information exchanged, the next step is the mutual agreement of the implementation of horizontal monitoring, codified in a binding compliance agreement and possible other covenants as a basis for cooperation. After successfully developing the compliance agreement, step six of this procedure is about the analysis and improvement of the tax control framework of the firm by improving, or implementing, a tax control framework in the company in coordination with the administration. In step seven the form and intensity of monitoring is determined, based on the specific requirements of the company. If all seven steps can be conducted successfully, the horizontal monitoring will be established. In principle, this agreement does not expire; however, periodic evaluations occur, typically every three years; with the option for either party to terminate the horizontal monitoring at any point in time.

Despite successful CCPs in countries like Austria (Enachescu et al. (2019)), the United States (Widt, Oats, and Mulligan (2019)) or the United Kingdom (Oats and Widt (2019)), there is a variety of countries where implementation was not successful yet due to bigger or smaller problems.[13] In the case of the Swedish fördjupad dialog ("in-depth dialogue"), a CCP was met with strong resistance and, in the end, failed (Hambre (2019), Larsen (2019)). The above-mentioned studies evaluating the CCPs find several possible reasons for the problems or the failure of the programs, but none of them investigates the influence of complexity in the tax system.

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[12] From 2020 onwards, the Netherlands adjusted the Horizontal Tax Monitoring to large companies only.
[13] E.g. Australia & New Zealand (Dabner and Burton (2009), Denmark (Boll and Brehm Johansen (2018)), Finland (Potka-Soininen, Pellinen, and Kettunen (2018)) and Norway (Brøgger and Aziz (2018)).

Nonetheless, tax complexity is a serious issue in the taxation process and might undermine the compliance and trust-enhancing effect of a CCP.[14] Measuring tax complexity is not easy and a highly discussed topic in the literature. Hoppe et al. (2023) provide with their Tax Complexity Index (TCI) a new and, for the purpose of this study, suitable and comprehensive approach. By surveying tax professionals all over the world they develop a measure for the overall complexity of a tax system over time and across jurisdictions. Prior approaches often only capture selected countries or few facets of the complexity of a tax system.[15] Another huge advantage of the TCI is its extensiveness. By using an input-oriented approach in the index construction, the index captures the different components of the tax system, e.g., different dimensions of the tax code and the tax framework. Given that the implementation of CCPs does not change the tax code itself but the taxation procedures, it is particularly important to study the role of the tax framework complexity.

Evidence on the relation of tax complexity and tax compliance is mixed. The majority of studies find a negative association between tax complexity and tax compliance, indicating an increased non-compliant behavior in the presence of tax complexity (Milliron (1985), Saad (2014), Budak and James (2018), Blesse (2021)). Borrego, Lopes, and Ferreira (2016) find empirically in a Portuguese setting, that tax complexity is related to unintended tax aggressive behavior and even fraud. Taing and Chang (2021) find in a study in Cambodia that unintended non-compliance by taxpayers increase in complex tax systems and are even able to show, that the likelihood of intentional non-compliance also increases with tax complexity. Sapiei, Kasipillai, and Eze (2014) consider tax complexity as a serious determinant of non-compliance in their Malaysian study. Taken together, one can think about complex tax systems as multidimensional constructs which are hard to monitor and contain inconsistencies and loopholes that might induce taxpayers to avoid intentionally or unintentionally, or even evade, taxes. Nevertheless, some studies raise concerns about the aforementioned relation between tax complexity and taxpayer compliance. Beck, Davis, and Jung (1991) and Cuccia and Carnes (2001) find evidence about a positive

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[14] Multiple studies underline possible implications of tax complexity. To name some, Collier et al. (2018) find an expected threat to economic prosperity, Budak and James (2018) propose an increase in tax planning or tax avoidance activities and Feldman, Katuščák, and Kawano (2016) state that tax complexity can cause confusion and lead to unintended behavioral responses by taxpayers.

[15] See figure 1 on p.5 of Hoppe et al. (2023) for an illustration of the different approaches on measuring tax complexity, divided into subcategories based on the numbers of facets of tax complexity and numbers of countries covered.

influence of tax complexity on tax compliance, indicating that a highly complex tax system fosters compliant taxpayer behavior. McKerchar (2005) find in an Australian setting, that tax professionals and taxpayers take more conservative positions in complex tax environments. McKerchar, Ingraham, and Karlinsky (2005) argue that complex tax systems increase perceived fairness by taxpayers and therefore positively influence compliance. Therefore, it remains an empirical question how CCPs in environments of different kinds of tax complexity impact tax compliance.

## 3    Hypothesis Development

As described in the previous chapter, the impact of a CCP on tax compliance is not clear. The OECD and the ICC encourage countries to enroll such programs for achieving higher levels of compliance by taxpayers but evaluation shows serious problems in a variety of countries.[16] Eberhartinger and Zieser (2021) define the relation between the authorities and the taxpayers as a principal-agent problem in which the tax authority as a stakeholder of the firm (Döllerer (1988), Moxter (1997), Euler (1998)) is the principal in the conflict (Reinganum and Wilde (1985)). Through the increased and earlier exchange of information in a cooperative compliance environment the information asymmetry is reduced and therefore potentially leads to higher compliance levels. The Slippery Slope Framework by Kirchler, Hoelzl, and Wahl (2008) define tax compliance (voluntary or ensured) by taxpayers to be established through two channels: Trust in the authorities and power of the authorities. Trust is defined as the perception of individuals and social groups that the tax authorities are benevolent and work beneficially.[17] Power is defined as to what extent a tax authority is able to enforce compliance, e.g., use of targeted audits, increase the audit probability, detect tax evasion etc.[18] Since CCPs are a signal of the tax authority to the taxpayers to be willing to cooperate in a trustful manner, the existence of a CCP marks a shift towards more trust in the sense of the slippery slope framework. This signal does not only influence eligible taxpayers, but may do spill over towards all taxpayers because trust signals from prosocial

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[16] See, e.g., for the failure of the Swedish cooperative compliance program Hambre (2019) and Larsen (2019). Siglé et al. (2022) find mixed compliance effects of the CCP in the Netherlands for different types of taxes.
[17] Falsetta, Schafer, and Tsakumis (2024) support the notion of trust in institutions increasing taxpayer compliance by finding in an experimental study that taxpayers are likely to be more compliant if they support governmental spending.
[18] See Kirchler, Hoelzl, and Wahl (2008), p. 212.

institutions spread (Engl, Riedl, and Weber (2021), Fochmann, Müller, and Overesch (2021)). There-fore, I expect the increase in trust between tax authorities and taxpayers through the signaling effect of a CCP to positively influence tax compliance.

*H1: Having a cooperative compliance program in place is positively associated with*

*tax compliance.*

The relation between tax complexity and tax compliance is discussed in the literature. Some studies state a positive association, others find a negative one.[19] Nevertheless, the majority of the litera-ture underline the notion of complexity in the tax code fostering non-compliant behavior, especially through loopholes in the tax system (Milliron (1985), Saad (2014), Ulph (2015)). The slippery slope framework of Kirchler, Hoelzl, and Wahl (2008), as well as its extension (Gangl, Hofmann, and Kirchler (2015)), predict complexity in the tax system to lead to a decrease in trust in the authorities and therefore to a decreased voluntary compliance by taxpayers. Therefore, I expect overall tax complexity to be negatively associated with tax compliance.

*H2: Tax complexity is negatively associated with tax compliance.*

Following the argumentation of Eberhartinger and Zieser (2021), I see the relation between the tax authority and the taxpayer as a principal-agent relation with the tax authority being a stakeholder of the taxpayer and therefore both are having a natural interest in each other. With the increased and time-lier exchange of information between authorities and taxpayers, CCPs decrease the information asym-metry in the principal-agent relation. Moreover, the slippery slope framework by Kirchler, Hoelzl, and Wahl (2008) identifies two possible reasons for compliant behavior by taxpayers: Perceived power of authorities or perceived trust in authorities. By building a horizontal monitoring environment, CCPs influence both dimensions of the slippery slope framework. In a CCP, the authorities and the taxpayers exchange information to a greater extent and timelier, the relation therefore becomes more trustful. Moreover, a shift in the quality and quantity of information provided to the tax authority ensures an increase in the perceived power of the authorities. As shown in the previous section, the majority of

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[19] See chapter *Theoretical and institutional background* for an extensive discussion on the association between tax complexity and tax compliance.

studies find complexity as a possible contributing factor for non-compliance. Therefore, I expect tax complexity to attenuate the positive association of CCPs and tax compliance.

*H3: Tax complexity attenuates the increase of tax compliance associated with*

*cooperative compliance programs.*

## 4    Research Design & Data

To test the aforementioned hypotheses H1-H3, I use OLS regressions with time-fixed-effects for the main analysis. The baseline model (I) includes the dependent variable *tax compliance* and the independent variables *complexity*, *cooperation,* and the interaction term *complexity × cooperation*. For testing the association between cooperation and tax compliance (H1), *complexity and complexity × cooperation* are excluded, for testing the association between tax complexity and tax compliance (H2) *cooperation* and *complexity × cooperation* are excluded. For the main analysis, investigating the interaction of cooperation and tax complexity, I apply the displayed baseline model (I) without exclusions.

$$(I) \qquad tax\ compliance_{j,t} =$$

$$\alpha_j + \beta_1\ complexity_{j,t} + \beta_2\ cooperation_{j,t} + \boldsymbol{\beta_3\ complexity_{j,t} \times cooperation_{j,t}} + controls + \varepsilon_{j,t}$$

*complexity* reflects the complexity of a tax system in a country *j* in a year *t,* measured by the TCI of Hoppe et al. (2023) in the main specification. I also use data from PwC and World Banks Paying Taxes study (PWC, World Bank Group (2020)) as alternative proxies for tax complexity in robustness tests. *cooperation* is an indicator variable reflecting if a CCP is in place or not for several years and countries. In the interaction term *complexity × cooperation,* the proxy for tax complexity is split into quintiles to distinguish between high and low complexity. It reflects an indicator variable that equals one if a country has a high level of tax complexity and a CCP in place in a certain year.

I also include country-level control variables. The control variables refer to the country-level controls used by Mendoza, Wielhouwer, and Kirchler (2017). In this set of controls, I include proxies for the corporate and personal income tax rate, the GDP per capita, the interest rate, the level of

government transparency, the level of political risk, and the audit level of a country.[20] Deviating from Mendoza, Wielhouwer, and Kirchler (2017), I do not include the variable *penalty*, because this data is not available in the IMF World Economic Outlook Database for the sample period of this study. As discussed in Mendoza, Wielhouwer, and Kirchler (2017) this set of control variables suits best for studies about audits, because the mentioned factors determine the shape, tone, and style of tax audits. CCPs, in the sense of this study, are a cooperative form of tax audits. Consequently, the mentioned control set is suitable for this study as well. Moreover, I apply a second set of control variables for testing the robustness of the results. Specifically, I use the World Governance Indicators (WGI) for controlling for the quality of the government of the countries in the sample. The WGI have very good data coverage throughout the sample period of this study. Additionally, I incorporated *GDP* in the second set of controls to controls for the size of the economy in the investigated countries.

This study utilizes several publicly accessible databases. First, the data of the TCI for the years 2016, 2018 and 2020 are used.[21] The tax complexity survey is conducted every second year, starting in 2016. The results reflect the perceived tax complexity of tax experts in up to 100 countries all around the world. In the study, tax complexity is defined as a feature of the tax system that is characterized by two sub-constructs: On the one hand, tax code complexity describes the difficulty of reading, understanding and complying with tax regulations that are affected by five complexity drivers. Therefore, the study identifies 15 internationally comparable tax regulations serving as dimensions for the tax code complexity. On the other hand, tax framework complexity describes the complexity that arises from the legislative and administrative processes and features within a tax system and is measured in five dimensions (Hoppe et al. (2023)). Since the underlying survey is conducted every second year, I impute the data for the missing years 2017 and 2019 with the mean value of the surrounding years. For testing H3, the TCI in the variable *complexity* is replaced by its subindices Tax Framework Complexity Index and Tax Code Complexity Index. When CCPs are implemented, they do not change the tax law itself, but its framework. By using the Tax Framework Complexity Index, which is included in the TCI, I am able to distinguish between complexity arising from a complex tax code and complexity arising from the

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[20] See Table 2 for variable descriptions and data sources.
[21] See https://taxcomplexity.org.

surrounding framework. Since a CCP is changing the tax framework, I expect CCPs to have a greater (positive) compliance-effect in countries with a more complex tax framework. Nevertheless, a complex tax code has an impact on the outcome of a CCP, measured by increased tax compliance behavior. CCPs aim to decrease information asymmetries and therefore increase trust in and power of tax authorities. A highly complex tax code has the potential to disseminate the positive effects in two possible ways: First, a complex tax code can diminish the understanding of steps undertaken by the authorities, even in a CCP. If taxpayers do not understand the authorities' actions and the background of those actions, information asymmetries can hardly be reduced. Second, trust between the authorities and the taxpayers in the slippery slope framework relies on mutual understanding. Comprehension of the actions of the other party is harder to gain if the tax code is highly complex. The same holds for the perceived power of authorities. In countries with highly complex tax codes, it is hard for authorities to detect fraud on the side of taxpayers and therefore effectively enforce it.

Second, I use the data of the International Survey on Revenue Administration (ISORA).[22] The survey has been conducted jointly by the International Monetary Fund (IMF), the Inter-American Center of Tax Administrations (CIAT), the Intra-European Organisation of Tax Administrations (IOTA), and the Organisation for Economic Cooperation and Development (OECD). Besides assisting revenue administrations to improve their focus on performance measurement and reporting and to improve advice for the revenue administrations, one of the aims of the survey is to provide a database for cross-country analyses. Revenue administrations use an online platform (RA-FIT Data Collection Platform) for participating in the survey. Every year, revenue administrations from more than 50 countries participate in the survey. Besides country-level information on many topics, the dataset contains information about CCPs in the participating countries. Table 1 shows the covered countries with their yearly status of the cooperative compliance approach. A "1" indicates an active CCP in the respective year, a "0" indicates that there has not been such a program.

[Insert Table 1 about here]

Third, I use country-level data of the World Bank, the OECD, the European Commission, the IMF, PWC and KPMG for dependent and independent variables. Furthermore, I use data from firm-

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[22] See https://data.rafit.org.

level data from Compustat Global to conduct country-averages of effective tax rates and compare them to the statutory corporate tax rates as an alternative proxy for non-compliance. See Table 2 for data sources and coverage.

[Insert Table 2 about here]

## 5    Results

As shown in Table 1, the final sample consists of 57 country observations from the sample period 2016-2020. This leads to a country-year panel with 285 observations. For dealing with missing values in the data and balancing the sample, some observations must be imputed. Table 3 displays summary statistics for all variables before and after imputation. Values are imputed in a two-step approach. First, in line with Mendoza, Wielhouwer, and Kirchler (2017), I impute values with the closest available observation per country, if available. Second, if there is no observation in a country at all, the values are imputed with the average value of all observations of the respective variables. The two-step imputation is not applied to the main variables *TaxEvasion*,[23] *CCP*, and *TaxComplexityIndex*. Since the underlying survey of the TCI is conducted every second year, I impute the data for the missing years 2017 and 2019 of the variable *TaxComplexityIndex* with the mean value of the adjacent years.[24]

[Insert Table 3 about here]

For testing hypothesis H1, I conduct OLS regressions with time-fixed-effects for three different proxies for tax compliance. As displayed in columns (1) and (3) of Table 4, I find support for the hypothesis that CCPs are significantly negatively associated with tax non-compliance if I use *TaxEvasion* and *Tax Gap* as a proxy for tax compliance. Although, the coefficient for the variable *CCP* is not statistically significant if controls are included. Moreover, the Audit Hit Rate is positively associated with CCPs (column (4)). *Audit Hit Rate* as a measure for tax compliance is used in Kotowski, Weisbach, and

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[23] The value for *TaxEvasion* for Cyprus in the year 2016 is not available. It is imputed with the mean value of *TaxEvasion* in Cyprus in the years 2017-2020. Imputation does not change results.

[24] Croatia, Estonia, Finland, Israel, Latvia, Mongolia, Saudi Arabia, and Slovenia are not reflected in each wave of the tax complexity survey. If it is not possible to impute values with the mean of adjacent years, i.e., if there is only one observation or if the observation for 2016 or 2020 is missing, values from the existing observations are adopted. This applies to Estonia, Mongolia, Saudi Arabia (only 2016 data) and Latvia (2016 data is missing). For Croatia, Finland, Israel, and Slovenia data is available for 2016 and 2020. These values act as the adjacent years.

Zeckhauser (2014). *Audit Hit Rate* is measured by the number of audits where a tax adjustment was made divided by the total number of audits completed times 100. A positive coefficient reflects a higher level of non-compliance and therefore does not support the hypothesis. CCPs, in most cases, restrict the ability of the tax authority of an ex-post audit. CCPs substitute tax audits via the CCP inherent eyes-sight relation. This could be a reason for the positive coefficient for *Audit Hit Rate*, because CCP companies are not included in the audit data in CCP countries. The results can be confirmed using an alternative set of controls, including the World Governance Indicators and GDP (columns (5) to (7)). The results remain robust, except for the specification with *TaxEvasion* as the dependent variable. Since the used alternative dependent variables *Audit Hit Rate* and *Tax Gap* may suffer from small data coverage to a certain degree (see Table 3), I stick to *TaxEvasion* as the proxy for tax compliance in the main analysis.

[Insert Table 4 about here]

I find significant evidence for the proposed association between tax complexity and tax compliance (H2). The results in Table 5 underline the notion that tax complexity has a negative association with tax compliance. Columns (1) to (3) show highly significant positive coefficients for association between *TaxComplexityIndex* and *TaxEvasion*. Column (1) displays the baseline result without controls, column (2) displays the main specification with the aforementioned set of controls, aligned with Mendoza, Wielhouwer, and Kirchler (2017). In column (3), the results with the alternative set of controls (World Governance Indicators and GDP). I also find a positive association here. Columns (4) to (6) display the results for an alternative proxy for tax complexity. When using the variable *Timehourspeyear* from the PWC and World Bank Paying Taxes study, the results are mixed. The baseline result indicates a positive association between tax complexity and tax compliance (column (4)). Nevertheless, the direction of the association changes to negative in the main control setting (column (5)) and vanishes in the alternative control setting. The variable *Timehourspeyear* measures the time for taxpayers to comply with their tax obligations. Since the complexity of a task is not directly measurable via the time need for completing the task,[25] the results of this proxy may be biased. For this reason, I stick to the TCI data as the main proxy for tax complexity in this study.

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[25] See Hoppe et al. (2023) for an extensive discussion on the measurement of tax complexity.

[Insert Table 5 about here]

The main results, displayed in tables 5 to 7, refer to the relation between CCPs and tax complexity and the resulting association with tax compliance and therefore the main analysis in this study. Table 6 shows the interaction described in hypothesis 3. To test H3, I include the interaction term *CCP_TCI_high*, which indicates if a country *j* in a year *t* has a cooperative compliance program in place and has a Tax Complexity Index value in the highest quintile of the corresponding year. In column (1), using the main specification of control variables, I see a positive value for this indicator, but do not find statistical significance. So, I find no significant evidence for H3. This is not surprising, because the associations of *CCP* and *TaxComplexityIndex* with *TaxEvasion* are opposing, as shown in tables 3 and 4. This result becomes even more convincing when looking at the complexity of the tax code and the tax framework separately and interact it with *CCP*. The coefficient of the interaction term *CCP_TCCI_high*, indicating a country having a CCP in place and having a highly complex tax code (top quintile), shows a positive and highly statistically significant sign (column (2)). The opposite is true for the complexity of the tax framework (*CCP_TFCI_high*, column (3)). The coefficient of the interaction term shows a negative sign. This shows that countries with a highly complex tax framework that engage in a CCP show a significant decrease in *TaxEvasion.* Speaking in economic terms, I find that countries in the top quintile of the Tax Code Complexity Index that have a CCP in place 4.83 % more *TaxEvasion* than the control group. For countries in the top quintile of the Tax Framework Complexity Index with a CCP my results suggest 4.73 % less *TaxEvasion* than in the control group. These findings suggest that CCPs do not seem to be effective if the tax code is highly complex but can be a useful tool to enhance compliance in highly complex tax frameworks. Notably, in each specification of columns (1) to (3), *interest_rate* is positively associated with *TaxEvasion,* whereas *GDPpercapita* and *gov_trust* are negatively related to *TaxEvasion.* The associations displayed in columns (1) to (3) for the interaction terms *CCP_TCI_high* and *CCP_TFCI_high* persist in the alternative control variable setting. The coefficient for *CCP_TCCI_high* is still negative, but statistically insignificant (columns (4) to (6)). A possible reason for the insignificance of the variable *CCP_TCCI_high* might be the choice of the control variables set (World Governance Indicators and GDP). Especially, the variable *rqe* might influence the coefficient of *CCP_TCCI_high.* The variable *rqe* reflects the regulatory quality in a country and

therefore will reflect the quality of the tax regulations, including its complexity. In untabulated results I exclude all control variables and find a statistically significant positive coefficient for *CCP_TCCI_high*. The exclusive exclusion of the variable *rqe* increases both the coefficient and the significance of the coefficient for *CCP_TCCI_high* but the coefficient is still statistically insignificant on conventional levels.

[Insert Table 6 about here]

To test the robustness of the aforementioned main results displayed in Table 6, I conduct several robustness tests (Table 7). First, I interact CCP with alternative measures for tax complexity. The used alternative tax complexity measures are *Timehoursperyear* (*ttc*) and *ScorePayingtaxes* (*pts*) from PWC and World Banks Paying Taxes study (PWC, World Bank Group (2020)). *Timehoursperyear* 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. A more complex tax system is expected to consume more time to comply with the resulting obligations. Therefore, a higher value of *Timehoursperyear* reflects a more complex tax system. *ScorePayingtaxes* reflects the simple average of the scores for each of the component indicators of the Paying Taxes study. Since the score, by its composition via multiple input factors, reflects the quality of a tax system, a high score of *ScorePayingtaxes* represents a less complex tax system. Both measures are not able to distinguish between the complexity of the tax code and tax framework but reflect a mixture of both complexity sources. The results in Table 7 underline the results found in the main analysis as displayed in Table 6.

[Insert Table 7 about here]

The interaction term *CCP_ttc_high* shows a positive association with *TaxEvasion* in each specification. Column (1) shows the baseline result without controls, columns (3) and (5) display the results with the two different sets of control variables. Notably, the result in column (5) is not statistically significant. The interaction term *CCP_pts_high* indicates a negative coefficient in each specification (columns (2), (4) and (6)). The results show that highly complex tax systems jeopardize the positive association of CCPs and tax compliance and can even reverse the association to more tax non-compliance.

There might be concerns about possible endogeneity between tax complexity and non-compliance and the likelihood of a country to engage in a CCP. One could think about countries with a high level of tax complexity to be more likely to have a CCP in place to tackle the inherent complexity of their tax system. To alleviate these concerns, I test the correlation between the variables *CCP* and *TaxComplexityIndex* and display these results in Table 8. Table 8 also displays the pairwise correlations of the main variables (panel A) and the alternative set of control variables (panel B). I find no significant correlation between CCP and TCI, the value is relatively small (-0.064). Additionally, I also use a t-test and find no significant difference in the level of tax complexity between countries with a CCP and those without one. Therefore, I do not expect serious issues regarding endogeneity in this study.

[Insert Table 8 about here]

## 6    Robustness Firm Level

The aforementioned results, which fully rely on country-level data, might raise generalizability concerns because usually only a limited number of firms per country are eligible to participate in CCPs, and even if they meet the requirements, participation is voluntary. Moreover, the requirements for participation often are not fully transparent for the general public and tax administrations often do not publish which firms are actually participating.[26] The country-level data do not allow to account for the decision of the firms to participate. As stated before, I expect all companies in a country to be influenced by the signal of having a CCP in place because the tax authority will be perceived as more trustful and this signal will spill over to all firms in a country (Engl, Riedl, and Weber (2021), Fochmann, Müller, and Overesch (2021)). Nevertheless, I expect the signal of having a CCP in place to affect eligible companies more strongly, even if they decide to not participate in the program, because they receive a direct possibility to cooperate with the tax authority. Therefore, in the following I will make use of firm-level Compustat data provided by Wharton Research Data Services (WRDS)[27] to control for the different

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[26] To grasp some insides into participation, Goslinga et al. (2021) investigate in a survey study in the Netherlands that roughly 18 % of the targeted firms participate in the program. They also find that larger firms, i.e. firms with more than 100 employees and sales greater than 50 million euros, are more likely to participate.

[27] https://wrds-www.wharton.upenn.edu/.

strengths of the signal to eligible and not eligible firms. I conduct single country studies to control for institutional peculiarities of the countries especially in regard to tax complexity.

I investigate Austria, as an example for a country with a moderate complex tax code and Italy, a country which is characterized by highly complex tax code. In Table 9, I display the Tax Code Complexity and resulting quantiles, based on the worldwide comparison for these countries for the sample period 2016-2020.[28] Moreover, I report the mean code complexity values over the whole sample period and the respective quantiles. The first and fifth quantiles indicate whether a firm faces a high level of code complexity (first quintile) or a low level of code complexity (fifth quintile) or something in between (second, third, and forth quantile), compared to all other countries in the worldwide MNC Tax Complexity Survey. Table 9 demonstrates that Italy's complexity values consistently rank in the top quintile in every year of this observation. Austria's complexity values rank consistently in the fourth quintile, but in the third quintile in the average over the whole sample period. Therefore, I consider Italy to be a high tax code complex country and Austria to be a moderate tax complex country.

[Insert Table 9 about here]

I investigate the influence of the eligibility to participate in a CCP of firms in the respective countries on tax compliance, since I expect eligible firms to be more strongly affected by the CCP than non-eligible firms. I apply three different independent variables for measuring non-compliance; *GAAP ETR*, *Cash ETR*, and *Non-compliance*. Using different forms of effective tax rates to measure (non-)compliance is widely accepted in the literature (Dyreng et al. (2017)). The variable *Non-compliance* is defined as the difference between the statutory corporate income tax rate and the GAAP ETR. To control for outliers in the data, independent variables are winsorised by 5 % and 95 %. The indicator variables *CCP_AUT* and *CCP_ITA* indicate that a firm is eligible to participate in a CCP in the respective country in the given year. These variables are the main variables of interest. I include control variables for several firm characteristics based on Eberhartinger et al. (2021). See Table 10 for the description of the firm-level variables and Table 11 for descriptive statistics.

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[28] For an enhanced and interactive representation of the Tax Complexity Indices for up to 100 countries see https://taxcomplexity.org. The Global MNC Tax Complexity Survey is conducted biannually. For the requirements of this study, the missing data for the years 2017 and 2019 is imputed by the means of the complexity values of the surrounding years.

[Insert Table 10 about here]

The criteria for joining a CCP in Austria are not publicly available from primary sources such as official government websites. Hence, the requirements firms have to meet for participation have to be deduced from secondary sources. According to Eberhartinger and Zieser (2021), Austrian firms must have sales greater than 40 million euros to be authorized to apply for the program.[29] In Italy, companies must have sales or revenues greater than 10 billion euros to participate in the CCP[30]. Applying these requirements to the dataset, this leads to 219 out of 261 firms eligible to participate in Austria and 29 out of 1,477 firms eligible to participate in Italy.

[Insert Table 11 about here]

In Table 12, I report the results of OLS regressions with year fixed effects based on firm-level Compustat panel data for the sample period 2016 to 2020. Columns (1) to (3) display the results for the moderate tax code complex country Austria and columns 4 to 6 display the results for the high tax code complex country Italy. Based on the country-level investigations in this study, I expect tax code complexity to be harmful for the compliance enhancement of the participation in a CCP. Therefore, from a theoretical standpoint, I expect the compliance enhancement of firm being eligible to participate in a CCP in Italy to disappear due to the complex tax code. Contrastingly, CCP-eligible firms in Austria should show relatively high levels of tax compliance. The results show that the CCP-eligible firms in Austria show higher levels of compliance, compared to the non-eligible firms. Columns (1) and (2) show significantly positive coefficients for *GAAP ETR* (0.0921) and *Cash ETR* (0.1609), column 3 reflects a significantly negative coefficient for *Non-compliance* (-0.0916). This translates into 3.39 (5.92) percentage points higher GAAP (Cash) ETRs and 3.37 percentage point lower non-compliance for firms being eligible for participation in the CCP in Austria. We do not find statistically significant results in any of the specifications in the Italian setting (columns (4) to (6)). This supports the notion of high tax code complexity being harmful for the positive association of CCPs and tax compliance, since Italian CCP-eligible firms, in contrast to CCP-eligible firms in Austria, do not show the positive association. This

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[29] Eberhartinger and Zieser (2021) conduct an investigation for Austria, for the participants of the pilot project, which ended in 2019. A CCP was subsequently integrated into Austrian law.

[30] See https://www.agenziaentrate.gov.it/portale/web/english/nse/invest-in-italy/cooperative-compliance-program.

finding might be due to the excessively high tax code complexity companies face in Italy. Although, this investigation suffers from some limitation in the identification of firms participating in CCPs, the results point towards the signal of a trustful tax authority, send through the possibility for firms joining a CCP, seem to increase tax compliance. However, this seem to be not true for countries with high levels of tax code complexity.

[Insert Table 12 about here]

## 7 Conclusion

In this study I investigate whether, how and under what conditions tax complexity can jeopardize the signal of a CCP towards a trustful relationship sent by tax authorities. The results are mixed for the role of overall tax system complexity for the outcome of CCPs on taxpayer compliance in the main specification. At first glance, there is little to no association between tax complexity and tax compliance in cooperative compliance environments. When decomposing tax complexity into its components, I find significant evidence for the signal of cooperative compliance being not effective in countries with highly complex tax codes but to be effective in countries with highly complex tax frameworks. In countries which have a CCP in place and a high level of tax framework complexity (tax code complexity) tax evasion is less (more) pronounced. Single-country studies underline these results. I conduct analyses at the firm-level in Austria, a moderate tax code complex country and Italy, a high tax code complex country. Both countries offer CCPs to eligible firms. I find evidence for the compliance enhancement of CCP-eligible firms in Austria but not for those in Italy. CCP-eligible firms in Austria indicate a 3.39 (5.92) percentage points higher GAAP (Cash) ETRs and 3.37 percentage point lower non-compliance. The fact that the compliance enhancement is not present in Italy may be due to the excessively high complexity in Italy's tax code.

The study contributes to the literature in three ways: Firstly, it adds to the sparse literature on the effectiveness of CCPs by providing substantial insights on the association between CCPs and tax compliance. Secondly, it introduces new insides into the association between tax complexity and tax compliance. Thirdly, the study is the first to investigate the role of tax complexity in the tax system, the tax code and the tax framework in cooperative compliance environments and how it translates into tax

compliance. It reveals that tax code complexity can undermine the compliance enhancement of CCPs. This study is particularly important for policymakers deciding about the implementation of a CCP in their country or being concerned about the level of tax complexity in their country. Moreover, the study provides a starting point for further research on the effects and implications of CCPs and the behavioral responses of corporate taxpayers.

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**Table 1: Status of cooperative compliance program per country**

| | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| Argentina | 0 | 0 | 0 | 0 | 1 |
| Australia | 1 | 1 | 1 | 1 | 1 |
| Austria | 1 | 1 | 1 | 1 | 1 |
| Belgium | 0 | 0 | 1 | 1 | 1 |
| Brazil | 0 | 0 | 0 | 0 | 0 |
| Bulgaria | 0 | 0 | 1 | 1 | 1 |
| Canada | 0 | 0 | 0 | 0 | 0 |
| Chile | 0 | 0 | 1 | 1 | 1 |
| China | 0 | 0 | 1 | 1 | 1 |
| Colombia | 0 | 0 | 0 | 0 | 1 |
| Croatia | 1 | 1 | 1 | 1 | 1 |
| Cyprus | 0 | 0 | 0 | 0 | 0 |
| Czech Republic | 0 | 0 | 0 | 0 | 0 |
| Denmark | 1 | 1 | 1 | 1 | 1 |
| Estonia | 0 | 0 | 0 | 0 | 0 |
| Finland | 1 | 1 | 1 | 1 | 1 |
| France | 0 | 0 | 1 | 1 | 1 |
| Germany | 0 | 0 | 0 | 0 | 0 |
| Greece | 0 | 0 | 0 | 0 | 0 |
| Hong Kong | 0 | 0 | 0 | 0 | 0 |
| Hungary | 0 | 0 | 1 | 1 | 1 |
| India | 0 | 0 | 1 | 1 | 1 |
| Indonesia | 0 | 0 | 1 | 1 | 1 |
| Ireland | 1 | 1 | 1 | 1 | 1 |
| Israel | 0 | 0 | 1 | 1 | 1 |
| Italy | 1 | 1 | 1 | 1 | 1 |
| Japan | 1 | 1 | 1 | 1 | 1 |
| Kazakhstan | 0 | 0 | 0 | 0 | 1 |
| Latvia | 1 | 1 | 1 | 1 | 1 |
| Lithuania | 0 | 0 | 1 | 1 | 1 |
| Luxembourg | 0 | 0 | 0 | 0 | 0 |
| Malaysia | 0 | 0 | 0 | 0 | 0 |
| Mexico | 0 | 0 | 1 | 1 | 1 |
| Mongolia | 0 | 0 | 0 | 0 | 1 |
| Netherlands | 1 | 1 | 1 | 1 | 1 |
| New Zealand | 1 | 1 | 1 | 1 | 1 |
| Norway | 1 | 1 | 1 | 1 | 1 |
| Peru | 0 | 0 | 1 | 1 | 1 |
| Philippines | 1 | 1 | 1 | 1 | 1 |
| Poland | 0 | 0 | 0 | 0 | 1 |
| Portugal | 0 | 0 | 1 | 1 | 1 |
| Romania | 0 | 0 | 0 | 0 | 0 |
| Russia | 1 | 1 | 1 | 1 | 1 |
| Saudi Arabia | 1 | 1 | 1 | 1 | 1 |
| Singapore | 1 | 1 | 1 | 1 | 1 |
| Slovakia | 0 | 0 | 1 | 1 | 1 |
| Slovenia | 1 | 1 | 1 | 1 | 1 |
| South Africa | 0 | 0 | 0 | 0 | 0 |

**Table 1: Continued**

|  | **2016** | **2017** | **2018** | **2019** | **2020** |
|---|---|---|---|---|---|
| Spain | 1 | 1 | 1 | 1 | 1 |
| Sweden | 1 | 1 | 1 | 1 | 1 |
| Switzerland | 1 | 1 | 0 | 0 | 0 |
| Taiwan | 0 | 0 | 0 | 0 | 0 |
| Thailand | 0 | 0 | 0 | 0 | 0 |
| Turkey | 0 | 0 | 0 | 0 | 1 |
| Ukraine | 0 | 0 | 0 | 0 | 0 |
| United Kingdom | 1 | 1 | 1 | 1 | 1 |
| United States | 1 | 1 | 1 | 1 | 1 |
|  |  |  |  |  |  |
| ∑ CCP | 22 | 22 | 35 | 35 | 41 |
| ∑ No CCP | 35 | 35 | 22 | 22 | 16 |
| ∑ Total | 57 | 57 | 57 | 57 | 57 |

Notes: This table presents an overview of the status of the cooperative compliance program in the 57 investigated countries per year (in place (1) or not (0)).

**Table 2: Variable descriptions and data sources**

| Variable | Description | Data source | Coverage | Values | Note |
|---|---|---|---|---|---|
| | | *Dependent variables* | | | |
| *Tax Evasion* | Tax Evasion survey measure | World Bank (Institute for Management & Development World Competitiveness Yearbook (WCY)) | 2016-2020 | 0-10 | Original measure is turned upside down (10-TaxEvasion), so a high score reflects a lot of tax evasion (in line with Mendoza et al.). |
| *Audit Hit Rate* | Corporate income tax: No. of audits where a tax adjustment was made / No. of audits completed * 100 | ISORA Database | 2016-2019 | 0-100 | Survey data. |
| *Tax Gap* | VAT Tax Gap (in million EUR) scaled by GDP (in million EUR) | European Commission (2020): Study and Reports on the VAT Gap in the EU-28 Member States, Table B6 | 2016-2018 | Total numbers | |
| | | *Independent Variables* | | | |
| *CCP* | Cooperative compliance program | ISORA Database | 2016-2019 | 0,1 | Indicator variable reflecting if a cooperative compliance program is in place (1) or not (0). No data for 2020 available yet. 2019 data imputed to 2020. |
| *TaxComplexityIndex* | Tax Complexity Index | taxcomplexity.org | 2016, 2018, 2020 | 0-1 | Values for missing years (2017 & 2019) are imputed with mean values of adjacent years. |
| *Timehoursperyear (ttc)* | Time to comply | PWC Paying Taxes | 2016-2020 | Total numbers (in hours) | 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. |
| *ScorePayingtaxes (pts)* | Score-Paying taxes (DB17-20 methodology). | PWC Paying Taxes | 2016-2020 | 0-100 | The score for paying taxes is the simple average of the scores for each of the component indicators of the Paying Taxes study. The score is computed based on the methodology in the DB17-20 studies. |

**Table 2: Continued**

| Variable | Description | Data source | Coverage | Values | Note |
|---|---|---|---|---|---|
| *CIT* | Corporate Income Tax Rate | KPMG Services: Tax Tools & Resources | 2016-2020 | Percentage rates | |
| *PIT* | (Top) Personal Income Tax Rate | KPMG Services: Tax Tools & Resources | 2016-2020 | Percentage rates | |
| *GDP* | Gross domestic product | IMF | 2016-2020 | Current USD, in billion USD | |
| *GDPpercapita* | GDP per capita | IMF | 2016-2020 | Current USD | |
| *interest_rate* | Short term lending interest rate | World Bank & OECD | 2016-2020 | Percentage rates | |
| *gov_transparency* | Transparency of government policy is satisfactory | World Bank (Institute for Management & Development World Competitiveness Yearbook (WCY)) | 2016-2020 | 0-10 | Survey data. |
| *political_risk* | The risk of political instability is very high | World Bank (Institute for Management & Development World Competitiveness Yearbook (WCY)) | 2016-2020 | 0-10 | Survey data. |
| *audit_level* | audits_total / CIT_taxpayers_total * 100 | OECD publication, data tables: Table A.162, | 2016-2019 | Total numbers | No data for 2020 available yet. 2019 data imputed to 2020. |
| *vae* | Voice and Accountability | World Bank | 2016-2020 | (-2.5)-2.5 | Worldwide Governance Indicators. |
| *pve* | Political Stability and Absence of Violence/Terrorism | World Bank | 2016-2020 | (-2.5)-2.5 | Worldwide Governance Indicators. |
| *gee* | Government Effectiveness | World Bank | 2016-2020 | (-2.5)-2.5 | Worldwide Governance Indicators. |
| *rqe* | Regulatory Quality | World Bank | 2016-2020 | (-2.5)-2.5 | Worldwide Governance Indicators. |
| *rle* | Rule of Law | World Bank | 2016-2020 | (-2.5)-2.5 | Worldwide Governance Indicators. |
| *cce* | Control of Corruption | World Bank | 2016-2020 | (-2.5)-2.5 | Worldwide Governance Indicators. |

Notes: This table presents an overview of all dependent and independent variables used in the country-level analyses including variable descriptions, data sources, coverages, values, and additional notes.

**Table 3: Summary statistics country-level**

| | Imputation | (1) N | (2) mean | (3) sd | (4) p5 | (5) p95 | (6) min | (7) max |
|---|---|---|---|---|---|---|---|---|
| *TaxEvasion* | Yes | 285 | 5.342 | 1.664 | 2.581 | 7.706 | 2 | 8.438 |
| *TaxEvasion* | No | 284 | 5.341 | 1.667 | 2.581 | 7.706 | 2 | 8.438 |
| *ScaledTaxGap* | Yes | 285 | 0.0102 | 0.00601 | 0.00309 | 0.0253 | 0.000609 | 0.0402 |
| *ScaledTaxGap* | No | 80 | 0.0106 | 0.00904 | 0.00227 | 0.0330 | 0.000609 | 0.0402 |
| *CITaudithitrate* | Yes | 285 | 52.95 | 22.23 | 13.81 | 93.04 | 1.408 | 99.73 |
| *CITaudithitrate* | No | 120 | 51.91 | 25.43 | 10.21 | 94.52 | 1.408 | 99.73 |
| *CCP* | Yes | 285 | 0.523 | 0.500 | 0 | 1 | 0 | 1 |
| *CCP* | No | 285 | 0.523 | 0.500 | 0 | 1 | 0 | 1 |
| *TaxComplexityIndex* | Yes | 285 | 0.374 | 0.0689 | 0.243 | 0.474 | 0.207 | 0.534 |
| *TaxComplexityIndex* | No | 160 | 0.373 | 0.0682 | 0.249 | 0.479 | 0.207 | 0.534 |
| *Timehoursperyear (ttc)* | YES | 285 | 212.5 | 258.4 | 55 | 334 | 32 | 2,600 |
| *Timehoursperyear (ttc)* | NO | 280 | 212.5 | 260.7 | 55 | 340 | 32 | 2,600 |
| *ScorePayingtaxes (pts)* | YES | 285 | 78.82 | 11.55 | 57.94 | 91.14 | 34.14 | 99.71 |
| *ScorePayingtaxes (pts)* | NO | 280 | 78.82 | 11.65 | 57.93 | 91.31 | 34.14 | 99.71 |
| *audit_level* | Yes | 285 | 69.27 | 115.0 | 0.589 | 319.1 | 0.208 | 726.1 |
| *audit_level* | No | 225 | 69.27 | 129.5 | 0.568 | 372.0 | 0.208 | 726.1 |
| *interest_rate* | Yes | 285 | 8.670 | 7.411 | 2.603 | 19.00 | 0 | 67.25 |
| *interest_rate* | No | 143 | 9.177 | 10.30 | 2.089 | 29.39 | 0 | 67.25 |
| *CIT* | Yes | 285 | 21.81 | 3.718 | 16 | 29.50 | 9 | 34 |
| *CIT* | No | 244 | 21.81 | 3.230 | 16.50 | 28 | 9 | 34 |
| *PIT* | Yes | 285 | 34.87 | 13.92 | 10 | 55.79 | 0 | 57.34 |
| *PIT* | No | 285 | 34.87 | 13.92 | 10 | 55.79 | 0 | 57.34 |
| *GDP* | Yes | 285 | 1,321 | 3,179 | 30.50 | 4,931 | 11.15 | 21,373 |
| *GDP* | No | 285 | 1,321 | 3,179 | 30.50 | 4,931 | 11.15 | 21,373 |
| *GDPpercapita* | Yes | 285 | 29,338 | 23,972 | 3,606 | 75,594 | 1,733 | 118,467 |
| *GDPpercapita* | No | 285 | 29,338 | 23,972 | 3,606 | 75,594 | 1,733 | 118,467 |
| *gov_trust* | Yes | 285 | 45.40 | 13.20 | 23.76 | 67.95 | 13.25 | 85.00 |
| *gov_trust* | No | 188 | 45.27 | 16.07 | 20.66 | 75.52 | 13.25 | 85.00 |
| *vae* | Yes | 285 | 0.639 | 0.813 | -1.188 | 1.562 | -1.728 | 1.725 |
| *vae* | No | 275 | 0.639 | 0.827 | -1.206 | 1.565 | -1.728 | 1.725 |
| *pve* | Yes | 285 | 0.305 | 0.758 | -0.987 | 1.326 | -2.009 | 1.616 |
| *pve* | No | 275 | 0.305 | 0.772 | -0.989 | 1.334 | -2.009 | 1.616 |
| *gee* | Yes | 285 | 0.864 | 0.723 | -0.217 | 1.949 | -0.572 | 2.335 |
| *gee* | No | 275 | 0.864 | 0.736 | -0.221 | 1.952 | -0.572 | 2.335 |
| *rqe* | Yes | 285 | 0.883 | 0.734 | -0.291 | 1.897 | -0.567 | 2.206 |
| *rqe* | No | 275 | 0.883 | 0.747 | -0.296 | 1.903 | -0.567 | 2.206 |
| *rle* | Yes | 285 | 0.750 | 0.861 | -0.556 | 1.931 | -0.794 | 2.079 |
| *rle* | No | 275 | 0.750 | 0.877 | -0.559 | 1.933 | -0.794 | 2.079 |
| *cce* | Yes | 285 | 0.690 | 0.959 | -0.784 | 2.170 | -0.911 | 2.284 |
| *cce* | No | 275 | 0.690 | 0.977 | -0.785 | 2.174 | -0.911 | 2.284 |

Notes: This table presents summary statistics of all variables used in the country-level analyses. 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 min and max value. All information is displayed for all variables with and without information.

**Table 4: Association between cooperative compliance programs and tax compliance**

| | (1) Tax Evasion | (2) Tax Evasion | (3) Tax Gap | (4) Audit Hit Rate | (5) Tax Evasion | (6) Tax Gap | (7) Audit Hit Rate |
|---|---|---|---|---|---|---|---|
| CCP | -0.6500*** | -0.0442 | -0.0019** | 6.0054** | 0.3290** | -0.0013** | 4.2208* |
| | (-3.10) | (-0.30) | (-2.36) | (2.90) | (2.80) | (-2.03) | (1.77) |
| audit_level | | -0.0005 | -0.0000*** | -0.0581*** | | | |
| | | (-1.00) | (-4.20) | (-3.87) | | | |
| interest_rate | | 0.0421*** | -0.0001*** | 0.3357*** | | | |
| | | (4.70) | (-3.75) | (2.71) | | | |
| CIT | | -0.0056 | 0.0001 | 1.2052*** | | | |
| | | (-0.34) | (1.47) | (3.70) | | | |
| PIT | | 0.0039 | -0.0001*** | -0.3362*** | | | |
| | | (0.66) | (-3.64) | (-3.20) | | | |
| GDPpercapita | | -0.0000*** | -0.0000 | 0.0000 | | | |
| | | (-9.36) | (-0.14) | (0.54) | | | |
| gov_trust | | -0.0247*** | -0.0001*** | -0.1725 | | | |
| | | (-3.51) | (-3.37) | (-1.41) | | | |
| vae | | | | | 0.9574*** | -0.0001 | 3.0863 |
| | | | | | (8.42) | (-0.12) | (1.56) |
| pve | | | | | 0.0629 | 0.0015*** | 1.5838 |
| | | | | | (0.76) | (3.11) | (0.71) |
| gee | | | | | -0.5169* | -0.0069*** | -17.7774** |
| | | | | | (-1.87) | (-2.77) | (-2.20) |
| rqe | | | | | 0.0233 | 0.0026** | 11.1671* |
| | | | | | (0.11) | (2.43) | (1.96) |
| rle | | | | | -0.4328 | 0.0066*** | -16.6058** |
| | | | | | (-1.41) | (2.61) | (-2.01) |
| cce | | | | | -1.3055*** | -0.0055*** | 8.8917* |
| | | | | | (-5.91) | (-3.94) | (1.72) |
| GDP | | | | | -0.0000 | 0.0000*** | 0.0026*** |
| | | | | | (-1.59) | (3.23) | (8.28) |
| Constant | 5.6952*** | 7.3465*** | 0.0204*** | 43.0616*** | 6.2023*** | 0.0127*** | 56.5350*** |
| | (38.27) | (14.80) | (7.60) | (4.95) | (44.73) | (12.75) | (18.18) |
| Year FE | YES | YES | YES | YES | YES | YES | YES |
| Observations | 285 | 285 | 285 | 285 | 285 | 285 | 285 |
| Adj. R-sq | 0.0236 | 0.6006 | 0.2123 | 0.1624 | 0.7232 | 0.1957 | 0.2203 |

Notes: This table presents the baseline estimates for the association between cooperative compliance programs and tax compliance for the dependent variables *Tax Evasion, Tax Gap* and *Audit Hit Rate* indicating tax compliance. *Tax Evasion* is a variable relying on survey data from the World Competitiveness Yearbook; a high score reflects high tax evasion. *Tax Gap* is the defined as the VAT tax gap in million EUR scaled by GDP. *Audit Hit Rate* is defined as the percentage of corporate income tax audits that resulted in a tax adjustment. *CCP* is an indicator variable reflecting if a cooperative compliance program is in place (1) or not (0). See Table 2 for variable definitions. ***, **, and * label statistical significance at 1%, 5% and 10% level, respectively. t statistics are given in parentheses and standard errors are heteroscedasticity robust. Year fixed-effects are included in all regressions.

**Table 5: Association between tax complexity and tax compliance**

| | (1) TaxEvasion | (2) TaxEvasion | (3) TaxEvasion | (4) TaxEvasion | (5) TaxEvasion | (6) TaxEvasion |
|---|---|---|---|---|---|---|
| TaxComplexityIndex | 14.7891*** | 6.1154*** | 4.4994*** | | | |
| | (13.70) | (5.78) | (3.32) | | | |
| Timehoursperyear | | | | 0.0018*** | -0.0008*** | -0.0003 |
| | | | | (3.71) | (-3.20) | (-1.56) |
| audit_level | | -0.0007 | | | -0.0007 | |
| | | (-1.38) | | | (-1.36) | |
| interest_rate | | 0.0336*** | | | 0.0591*** | |
| | | (3.48) | | | (5.83) | |
| CIT | | -0.0236 | | | -0.0021 | |
| | | (-1.58) | | | (-0.13) | |
| PIT | | 0.0008 | | | 0.0031 | |
| | | (0.14) | | | (0.53) | |
| GDPpercapita | | -0.0000*** | | | -0.0000*** | |
| | | (-8.03) | | | (-9.73) | |
| gov_trust | | -0.0182*** | | | -0.0275*** | |
| | | (-2.82) | | | (-4.07) | |
| vae | | | 0.8483*** | | | 0.9560*** |
| | | | (7.40) | | | (8.39) |
| pve | | | 0.1011 | | | 0.0621 |
| | | | (1.23) | | | (0.76) |
| gee | | | -0.0211 | | | -0.5303** |
| | | | (-0.07) | | | (-1.99) |
| rqe | | | 0.1391 | | | -0.0340 |
| | | | (0.65) | | | (-0.16) |
| rle | | | -0.6795** | | | -0.3529 |
| | | | (-2.18) | | | (-1.17) |
| cce | | | -1.2496*** | | | -1.3024*** |
| | | | (-5.43) | | | (-5.74) |
| GDP | | | -0.0000*** | | | -0.0000 |
| | | | (-2.81) | | | (-0.81) |
| Constant | -0.1890 | 5.1138*** | 4.3915*** | 4.9515*** | 7.4494*** | 6.4347*** |
| | (-0.45) | (8.61) | (7.22) | (35.70) | (15.16) | (43.60) |
| Year FE | YES | YES | YES | YES | YES | YES |
| Observations | 285 | 285 | 285 | 285 | 285 | 285 |
| Adj. R-sq | 0.3688 | 0.6408 | 0.7341 | 0.0704 | 0.6099 | 0.7166 |

Notes: This table presents the baseline estimates for the association between tax complexity and tax compliance for the dependent variable *Tax Evasion* indicating tax compliance. *Tax Evasion* is a variable relying on survey data from the World Competitiveness Yearbook; a high score reflects high tax evasion. *TaxComplexityIndex* is indicating the complexity of the tax system. *Timehoursperyear* indicating the time to comply with tax laws. See Table 2 for variable definitions. ***, **, and * label statistical significance at 1%, 5% and 10% level, respectively. t statistics are given in parentheses and standard errors are heteroscedasticity robust. Year fixed-effects are included in all regressions.

## Table 6: Interaction cooperative compliance program & high levels of tax complexity

| | (1) TaxEvasion | (2) TaxEvasion | (3) TaxEvasion | (4) TaxEvasion | (5) TaxEvasion | (6) TaxEvasion |
|---|---|---|---|---|---|---|
| CCP | -0.1771 | -0.2664* | 0.2003 | 0.2275* | 0.1874 | 0.4387*** |
| | (-1.20) | (-1.75) | (1.46) | (1.87) | (1.51) | (3.75) |
| Tax Complexity | 5.3496*** | | | 4.0051*** | | |
| | (5.18) | | | (2.73) | | |
| CCP_TCI_high | 0.3400 | | | 0.0225 | | |
| | (1.47) | | | (0.12) | | |
| TaxCodeComplexity | | 1.9085** | | | 1.6944* | |
| | | (2.35) | | | (1.69) | |
| CCP_TCCI_high | | 0.6980*** | | | 0.1949 | |
| | | (3.69) | | | (1.08) | |
| TaxFrameworkComplexity | | | 9.2196*** | | | 6.5455*** |
| | | | (7.31) | | | (4.64) |
| CCP_TFCI_high | | | -1.1923*** | | | -0.8798*** |
| | | | (-3.74) | | | (-3.15) |
| audit_level | -0.0008 | -0.0004 | -0.0006 | | | |
| | (-1.52) | (-0.88) | (-1.54) | | | |
| interest_rate | 0.0337*** | 0.0396*** | 0.0262** | | | |
| | (3.62) | (4.58) | (2.40) | | | |
| CIT | -0.0258* | -0.0190 | -0.0132 | | | |
| | (-1.74) | (-1.18) | (-0.88) | | | |
| PIT | 0.0029 | -0.0009 | 0.0088* | | | |
| | (0.51) | (-0.16) | (1.67) | | | |
| GDPpercapita | -0.0000*** | -0.0000*** | -0.0000*** | | | |
| | (-8.15) | (-9.05) | (-7.72) | | | |
| gov_trust | -0.0192*** | -0.0200*** | -0.0149** | | | |
| | (-2.95) | (-3.06) | (-2.31) | | | |
| Constant | 5.4739*** | 6.6607*** | 4.0209*** | 4.5133*** | 5.4033*** | 3.9220*** |
| | (8.68) | (11.99) | (6.03) | (7.01) | (10.36) | (7.31) |
| Year FE | YES | YES | YES | YES | YES | YES |
| Alternative Controls | NO | NO | NO | YES | YES | YES |
| Observations | 285 | 285 | 285 | 285 | 285 | 285 |
| Adj. R-sq | 0.6418 | 0.6343 | 0.6632 | 0.7361 | 0.7301 | 0.7465 |

Notes: This table presents the baseline estimates for the interaction of cooperative compliance programs & high levels of tax complexity for the dependent variable *Tax Evasion* indicating tax compliance. *Tax Evasion* is a variable relying on survey data from the World Competitiveness Yearbook; a high score reflects high tax evasion. *CCP* is an indicator variable that measures whether a cooperative compliance program is in place (1) or not (0). *Tax Complexity* indicates the complexity of the tax system. *CCP_TCI_high* is an interaction term indicating whether a country in a given year both operates a cooperative compliance program and has a Tax Complexity Index value in the highest quintile for that year. *TaxCodeComplexity* indicates the complexity of a tax system's code. *CCP_TCCI_high* indicates whether a country in a given year has both a CCP and a Tax Code Complexity Index value in the highest quintile for that year. *TaxFrameworkComplexity* measures the complexity arising from the legislative and administrative processes and features within a tax system. *CCP_TFCI_high* indicates whether a country in a given year has both a CCP and a Tax Framework Complexity Index value in the highest quintile for that year. The alternative controls set applied in columns (4) to (6) consists of the WGI (*vae*, *pve*, gee, *rqe*, *rle*, *cce*) and *GDP*. See Table 2 for variable definitions. ***, **, and * label statistical significance at 1%, 5% and 10% level, respectively. t statistics are given in parentheses and standard errors are heteroscedasticity robust. Year fixed-effects are included in all regressions.

**Table 7: Interaction cooperative compliance program & high levels of tax complexity with alternative complexity measures**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | TaxEvasion | TaxEvasion | TaxEvasion | TaxEvasion | TaxEvasion | TaxEvasion |
| CCP | -0.8610*** | -0.0987 | -0.2678* | 0.1122 | 0.2691** | 0.3420*** |
| | (-3.97) | (-0.54) | (-1.77) | (0.75) | (2.03) | (2.29) |
| Timehoursperyear | 0.0013*** | | -0.0011*** | | -0.0003 | |
| | (3.67) | | (-4.09) | | (-1.37) | |
| CCP_ttc_high | 1.6134*** | | 0.8650*** | | 0.1635 | |
| | (6.75) | | (3.94) | | (1.01) | |
| ScorePayingtaxes | | -0.0749*** | | -0.0235** | | -0.0169* |
| | | (-8.21) | | (-2.36) | | (-1.78) |
| CCP_pts_high | | -0.6526** | | -0.4581** | | -0.0399 |
| | | (-2.26) | | (-2.33) | | (-0.022) |
| audit_level | | | -0.0007 | -0.0007 | | |
| | | | (-1.56) | (-1.46) | | |
| interest_rate | | | 0.0661*** | 0.3001*** | | |
| | | | (5.84) | (2.90) | | |
| CIT | | | 0.0021 | -0.0367** | | |
| | | | (0.15) | (-2.23) | | |
| PIT | | | 0.0010 | 0.0034 | | |
| | | | (0.16) | (0.58) | | |
| GDPpercapita | | | -0.0000*** | -0.0000*** | | |
| | | | (-8.82) | (-7.66) | | |
| gov_trust | | | -0.0259*** | -0.0214*** | | |
| | | | (-3.92) | (-3.11) | | |
| Constant | 5.3149*** | 11.3960*** | 7.2796*** | 9.6736*** | 6.3033*** | 7.3541*** |
| | (29.46) | (15.86) | (15.34) | (9.46) | (37.86) | (10.95) |
| | | | | | | |
| Year FE | YES | YES | YES | YES | YES | YES |
| Alternative Controls | NO | NO | NO | NO | YES | YES |
| Observations | 285 | 285 | 285 | 285 | 285 | 285 |
| Adj. R-sq | 0.1742 | 0.3463 | 0.6312 | 0.6208 | 0.7231 | 0.7280 |

Notes: This table presents the estimates for the interaction of cooperative compliance programs & high levels of tax complexity for the dependent variable *Tax Evasion* indicating tax compliance with alternative measures for tax complexity. *Tax Evasion* is a variable relying on survey data from the World Competitiveness Yearbook; a high score reflects high tax evasion. *CCP* is an indicator variable that measures whether a cooperative compliance program is in place (1) or not (0). *Timehoursperyear* indicating the time to comply with tax laws. *CCP_ttc_high* indicates whether a country in a given year has both a CCP and a value for time to comply in the highest quintile for that year. *ScorePayingtaxes* reflects the simple average of the scores for each of the component indicators of the Paying Taxes study. *CCP_pts_high* indicates whether a country in a given year has both a CCP and a high score on the Paying Taxes study. The alternative controls set applied in columns (5) and (6) consists of the WGI (*vae*, *pve*, *gee*, *rqe*, *rle*, *cce*) and *GDP*. See Table 2 for variable definitions. ***, **, and * label statistical significance at 1%, 5% and 10% level, respectively. t statistics are given in parentheses and standard errors are heteroscedasticity robust. Year fixed-effects are included in all regressions.

**Table 8: Pairwise correlations**

Panel A: Main specification

| | TaxEvasion | CCP | TaxComplexity Index | audit_level | interest_rate | CIT | PIT | GDP percapita | gov_trust |
|---|---|---|---|---|---|---|---|---|---|
| TaxEvasion | 1.000 | | | | | | | | |
| CCP | -0.239* | 1.000 | | | | | | | |
| TaxComplexityIndex | 0.611* | -0.064 | 1.000 | | | | | | |
| audit_level | -0.156* | 0.145* | -0.036 | 1.000 | | | | | |
| interest_rate | 0.375* | -0.251* | 0.319* | -0.070 | 1.000 | | | | |
| CIT | 0.068 | 0.025 | 0.235* | -0.029 | 0.155* | 1.000 | | | |
| PIT | -0.302* | 0.285* | -0.109 | 0.049 | -0.106 | 0.299* | 1.000 | | |
| GDPpercapita | -0.743* | 0.266* | -0.533* | 0.174* | -0.269* | -0.041 | 0.457* | 1.000 | |
| gov_trust | -0.537* | 0.043 | -0.447* | 0.035 | -0.160* | -0.062 | 0.179* | 0.541* | 1.000 |

Panel B: Alternative specification

| | TaxEvasion | CCP | TaxComplexity Index | vae | pve | gee | rqe | rle | cce | GDP |
|---|---|---|---|---|---|---|---|---|---|---|
| TaxEvasion | 1.000 | | | | | | | | | |
| CCP | -0.239* | 1.000 | | | | | | | | |
| TaxComplexityIndex | 0.611* | -0.064 | 1.000 | | | | | | | |
| vae | -0.363* | 0.164* | -0.310* | 1.000 | | | | | | |
| pve | -0.537* | 0.229* | -0.468* | 0.670* | 1.000 | | | | | |
| gee | -0.789* | 0.350* | -0.618* | 0.667* | 0.744* | 1.000 | | | | |
| rqe | -0.722* | 0.296* | -0.581* | 0.746* | 0.762* | 0.929* | 1.000 | | | |
| rle | -0.759* | 0.326* | -0.557* | 0.757* | 0.784* | 0.964* | 0.948* | 1.000 | | |
| cce | -0.783* | 0.311* | -0.576* | 0.737* | 0.752* | 0.954* | 0.939* | 0.972* | 1.000 | |
| GDP | -0.141* | 0.161* | 0.107 | -0.118* | -0.080 | 0.102 | 0.008 | 0.057 | 0.044 | 1.000 |

Notes: This table presents pairwise person correlation coefficients for the main dependent variable *TaxEvasion* and all independent variables of the country-level analyses. Panel A (B) includes the variables of the main (alternative) specification. * label statistical significance at the 5% level.

**Table 9: Tax Code Complexity per country**

|  |  | Austria | Italy |
|---|---|---|---|
| 2016 | Tax Code Complexity Index | 0.481 | 0.559 |
|  | Quantile | 4 | 5 |
| 2017 | Tax Code Complexity Index | 0.479 | 0.574 |
|  | Quantile | 4 | 5 |
| 2018 | Tax Code Complexity Index | 0.478 | 0.589 |
|  | Quantile | 4 | 5 |
| 2019 | Tax Code Complexity Index | 0.480 | 0.591 |
|  | Quantile | 4 | 5 |
| 2020 | Tax Code Complexity Index | 0.482 | 0.594 |
|  | Quantile | 4 | 5 |
| Mean | Tax Code Complexity Index | 0.480 | 0.581 |
|  | Quantile | 3 | 5 |

Notes: This table presents the complexity of the tax code and the respective quantile for Austria and Italy based on the Tax Complexity Index by Hoppe et al. (2021). The quantiles refer to a worldwide comparison on a yearly basis.

**Table 10: Variable descriptions and data sources (firm-level)**

| Variable | Description | Data source | Coverage |
|---|---|---|---|
| | **Independent variables** | | |
| *GAAP ETR* | Income taxes total (TXT) by pretax income (PI). Winsorized by 5 and 95%. | compustat | 2016-2020 |
| *Cash ETR* | Income taxes paid (TXPD) by pretax income (PI). Winsorized by 5 and 95%. | compustat | 2016-2020 |
| *Non-compliance* | Corporate statutory income tax rate minus ETR. | compustat | 2016-2020 |
| | **Dependent variables** | | |
| *Pre-Tax ROA* | Pre-tax Income (PI) scaled by lagged total assets (AT). | compustat | 2016-2020 |
| *Prior Loss* | A dummy variable, equal to 1 if the firm had negative Pre-Tax ROA in the previous year and 0 otherwise. | compustat | 2016-2020 |
| *Sales Growth* | Percentage change in Sales (SALE) from year t-1 to year t. | compustat | 2016-2020 |
| *PP&E* | Net property, plant, and equipment (PP&ENT) scaled by lagged total assets (AT). | compustat | 2016-2020 |
| *Leverage* | Sum of long-term and short-term debt, scaled by lagged total assets, set to zero if missing. | compustat | 2016-2020 |
| *R&D* | R&D Expense in year t scaled by lagged total assets, set to zero if missing. | compustat | 2016-2020 |
| *Cash* | Cash and equivalents scaled by lagged total assets, set to zero if missing. | compustat | 2016-2020 |
| *Ln Assets* | Natural log of total assets. | compustat | 2016-2020 |

Notes: This table presents an overview of all dependent and independent variables used in the firm-level analyses including variable descriptions, data sources, and coverages.

**Table 11: Summary statistics firm-level**

Panel A: Austria

|  | (1)<br>N | (2)<br>mean | (3)<br>sd | (4)<br>p5 | (5)<br>p95 | (6)<br>min | (7)<br>max |
|---|---|---|---|---|---|---|---|
| *GAAP ETR* | 261 | 0.177 | 0.153 | -0.195 | 0.366 | -0.195 | 0.531 |
| *Cash ETR* | 225 | 0.189 | 0.222 | -0.151 | 0.586 | -0.305 | 1.105 |
| *Non-compliance* | 261 | 0.0482 | 0.153 | -0.146 | 0.418 | -0.286 | 0.418 |
| *Pretax ROA* | 261 | 0.0346 | 0.149 | -0.0936 | 0.135 | -1.370 | 0.333 |
| *Prior Loss* | 261 | 0.103 | 0.305 | 0 | 1 | 0 | 1 |
| *Sales Growth* | 261 | 0.0462 | 0.315 | -0.218 | 0.322 | -1 | 3.880 |
| *PP & E* | 261 | 0.302 | 0.185 | 0.00117 | 0.579 | 0 | 0.804 |
| *Leverage* | 261 | 0.277 | 0.228 | 0 | 0.657 | 0 | 2.187 |
| *R & D* | 261 | 0.0347 | 0.0865 | 0 | 0.184 | 0 | 0.907 |
| *Cash* | 261 | 0.144 | 0.208 | 0.00238 | 0.390 | 0 | 2.284 |
| *Ln Assets* | 261 | 6.332 | 2.086 | 2.563 | 9.368 | 0.127 | 10.81 |
| *CCP_AUT* | 261 | 0.839 | 0.368 | 0 | 1 | 0 | 1 |

Panel B: Italy

|  | (1)<br>N | (2)<br>mean | (3)<br>sd | (4)<br>p5 | (5)<br>p95 | (6)<br>min | (7)<br>max |
|---|---|---|---|---|---|---|---|
| *GAAP ETR* | 1,477 | 0.207 | 0.190 | -0.192 | 0.531 | -0.195 | 0.531 |
| *Cash ETR* | 1,035 | 0.226 | 0.280 | -0.273 | 0.768 | -0.305 | 1.105 |
| *Non-compliance* | 1,477 | 0.0134 | 0.189 | -0.286 | 0.417 | -0.286 | 0.418 |
| *Pretax ROA* | 1,477 | 0.0349 | 0.220 | -0.176 | 0.209 | -1.498 | 5.515 |
| *Prior Loss* | 1,477 | 0.214 | 0.410 | 0 | 1 | 0 | 1 |
| *Sales Growth* | 1,477 | 2.568 | 74.16 | -0.384 | 0.600 | -1 | 2,788 |
| *PP & E* | 1,477 | 0.280 | 2.660 | 0 | 0.618 | 0 | 102.1 |
| *Leverage* | 1,477 | 0.353 | 1.624 | 0 | 0.681 | 0 | 61.91 |
| *R & D* | 1,477 | 0.0164 | 0.138 | 0 | 0.0627 | 0 | 5.069 |
| *Cash* | 1,477 | 0.176 | 0.381 | 0.00369 | 0.474 | 0 | 11.48 |
| *Ln Assets* | 1,477 | 5.302 | 2.202 | 2.093 | 9.100 | -2.087 | 12.08 |
| *CCP_AUT* | 1,477 | 0.0196 | 0.139 | 0 | 0 | 0 | 1 |

Notes: This table presents summary statistics of all variables used in the firm-level analyses. 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 min and max value

**Table 12: Country studies in Austria & Italy**

| Tax Code Complexity | Austria<br>Moderate | | | Italy<br>High | | |
| --- | --- | --- | --- | --- | --- | --- |
| | (1)<br>*GAAP ETR* | (2)<br>*Cash ETR* | (3)<br>*Non-compliance* | (4)<br>*GAAP ETR* | (5)<br>*Cash ETR* | (6)<br>*Non-compliance* |
| *CCP_AUT* | 0.0921*** | 0.1609** | -0.0916*** | | | |
| | [2.72] | [2.09] | [-2.73] | | | |
| *CCP_ITA* | | | | 0.0088 | 0.0146 | -0.0080 |
| | | | | [0.25] | [0.25] | [-0.23] |
| *Pre-Tax ROA* | 0.1052 | -0.1059 | -0.1037 | 0.1292*** | 0.1580 | -0.1298*** |
| | [1.19] | [-0.74] | [-1.19] | [4.62] | [1.59] | [-4.72] |
| *Prior Loss* | -0.0430 | -0.2051*** | 0.0437 | -0.1371*** | -0.2152*** | 0.1378*** |
| | [-1.35] | [-4.05] | [1.39] | [-11.21] | [-8.15] | [11.46] |
| *Sales Growth* | -0.0478 | -0.0077 | 0.0483 | 0.0002** | -0.0003 | -0.0001** |
| | [-1.61] | [-0.09] | [1.65] | [2.43] | [-0.46] | [-2.35] |
| *PP&E* | 0.0184 | -0.0163 | -0.0185 | -0.0097 | -0.1129*** | 0.0089 |
| | [0.30] | [-0.17] | [-0.30] | [-0.79] | [-2.67] | [0.74] |
| *Leverage* | -0.0853* | -0.1347 | 0.0856* | 0.0172 | 0.0448 | -0.0154 |
| | [-1.73] | [-1.65] | [1.75] | [0.84] | [1.15] | [-0.77] |
| *R&D* | -0.4363** | -0.3786 | 0.4304** | -0.1686*** | -0.2096 | 0.1678*** |
| | [-2.24] | [-1.21] | [2.23] | [-3.89] | [-0.87] | [3.94] |
| *Cash* | 0.2854*** | 0.1944* | -0.2829*** | -0.0220 | 0.0241 | 0.0198 |
| | [4.08] | [1.79] | [-4.08] | [-1.14] | [0.45] | [1.05] |
| *Ln Assets* | -0.0004 | -0.0128 | 0.0001 | 0.0049** | 0.0095** | -0.0049** |
| | [-0.07] | [-1.40] | [0.02] | [2.10] | [2.20] | [-2.15] |
| Constant | 0.0971*** | 0.1795** | 0.1289*** | 0.2090*** | 0.1999*** | 0.0118 |
| | [3.06] | [2.26] | [4.10] | [14.55] | [6.72] | [0.83] |
| Year FE | YES | YES | YES | YES | YES | YES |
| Observations | 261 | 225 | 261 | 1,477 | 1,035 | 1,477 |
| Adj. R-sq | 0.1591 | 0.0937 | 0.1618 | 0.1406 | 0.0815 | 0.1461 |

Notes: This table presents the estimates for the tax noncompliance of CCP-eligible firms in Austria and Italy for the dependent variables *ETR*, *Cash ETR* and *Non-compliance*. *ETR* indicates the actual tax burden on a company's earnings. *Cash ETR* indicates the actual cash outflow for tax purposes. *Non-compliance* indicates the extent to which a company's effective tax rate (ETR) deviates from the statutory corporate income tax rate. *CCP_AUT* indicates that a firm is eligible to participate in a cooperative compliance program in Austria for a given year. *CCP_ITA* indicates that a firm is eligible to participate in a cooperative compliance program in Italy for a given year. See Table 10 for variable definitions. ***, **, and * label statistical significance at 1%, 5% and 10% level, respectively. t statistics are given in parentheses and standard errors are heteroscedasticity robust. Year fixed-effects are included in all regressions.