LUIZ GUILHERME ROTH CANTARELLI

Do Democracies Tax Progressively?

São Paulo

2021

LUIZ GUILHERME ROTH CANTARELLI

Do Democracies Tax Progressively?

Versão Original

Dissertação apresentada ao Departamento de Ciência Política da Universidade de São Paulo para obtenção do título de Mestre em Ciência Política.

Área de Concentração: Ciência Política

Orientadora: Profa. Dra. Lorena Guadalupe Barberia

São Paulo

2021

CANTARELLI, L. G. R. **"Do Democracies Tax Progressively?"**.2021. Dissertação (Mestrado em Ciência Política) – Faculdade de Filosofia, Letras e Ciências Humanas, Universidade de São Paulo, São Paulo, 2021.

Aprovado em:

Banca Examinadora

Prof. Dr.:   _____

Instituição: _____

Julgamento: _____

Prof. Dr.:   _____

Instituição: _____

Julgamento: _____

Prof. Dr.:   _____

Instituição: _____

Julgamento: _____

Dedico este trabalho a todos que sonharam comigo, aos que me abriram caminhos e aos que os percorreram ao meu lado. Dedico também a todas as pessoas que diminuíram o sofrimento destes tempos tão difíceis. Aos meus famíliares, a quem agradeço imensamente pelo amor e suporte.

Acknowledgements

Resumo

A literatura que discute os efeitos da democratização sobre a desigualdade dedica atenção apenas limitada aos impostos e especialmente à progressividade tributária. Impostos possuem a capacidade de impactar de maneira significativa a distribuição de renda e riqueza, sendo mecanismos centrais para a redução da desigualdade. Medir a progressividade tributária é tarefa complexa, pouco explorada por autores na ciência política. Neste estudo, com dados tributários para 69 países, analiso os efeitos da democratização sobre a progressividade tributária no longo prazo. Para este fim, utilizo três medidas de progressividade tributária e anos cumulativos em que regimes democráticos perduraram. Apresento uma análise de séries temporais comparadas para mostrar que longos períodos de democracia impactam de maneira bastante limitada a progressividade dos tributos.

Palavras-chaves: Desigualdade; Democracia; Imposto Progressivo; Sistema Tributário; Anos de Democracia.

Abstract

The majority of studies that analyze the effects of democratization on inequality reduction dedicate limited attention to taxation and especially to tax progressivity. Taxes have the capacity of impacting significantly wealth and income distribution, being central mechanisms for inequality reduction. Measuring tax progressivity is a very complex task that has been explored by very few authors in political science. In this study, with tax data for 69 countries, I explore whether long term democratization has a significant and substantial impact on on the progressive structure of tax systems. To do so, I employ three measures of tax progressivity and the years that democracy has endured as the governing regime. I present a comparative time series analysis to show that long periods of democracy have only minor cumulative effects on tax progressivity.

Keywords: Inequality, Democracy, Tax progressivity, Tax system, Years in Democracy.

List of Figures

List of Tables

Contents

1 Introduction

In studies of inequality, democratization is widely discussed as a determinant factor, and progressive spending and taxation are assumed mechanisms for wealth and income leveling (MELTZER; RICHARD, 1981; RODRIK, 1999; ACEMOGLU; NAIDU, et al., 2015). There is a diverse set of theories that relate democratization, political freedom and the increase in suffrage to expected distributive outcomes. Nevertheless, the outcomes attributed to democratization in these studies are still largely conflicting and inconclusive, especially regarding its effects on income and wealth distribution.

Beyond the empirical critique to studies that follow the median voter theory proposed by Meltzer and Richard, other scholars have defended that electoral pressure is weaker for tax policies, and thus democratization is not necessarily correlated with tax progressivity. While Bartels (2008) shows voters may be misinformed on tax policies, Fairfield and Garay (2017) show that even when there is electoral pressure for progressive tax reforms, elites constrain major changes and the impacts on policy implementation are therefore minor.

This reality highlights the importance of better exploring tax policies with the objective of understanding political institutions and their relations to inequality. In this paper, I test the impact of democratization on tax progressivity in order to evaluate if it contributes to minor (such as proposed by Fairfield and Garay) or major effects (expected as a consequence of the median voter theory). Following studies that highlight the long-run effects of democratization on economic outcomes, I seek to analyze the effects of cumulative years in democracy on tax progressivity.

By using three different measures of tax progressivity, I show that cumulative years on democracy matters for the progressive composition of taxes, having significant effects on the preferred models. On the other hand, I also show that the positive effects of democratization are substantively minor, not being able to explain the variation on tax progressivity between countries. This is a major contribution to the literature, since it not only shows that democracy, even in the long term, is incapable of producing relevant impact on tax progressivity, but also shows that tax systems seem to be strongly path dependent.

The understanding of the causes of more or less progressive regimes around the world is central to the study of inequality. Taxation presents a strong capacity of impacting income and wealth, being a powerful policy to reduce inequalities (PIKETTY; GOLDHAMMER, 2014), for example, a regressive tax system can minimize or even cancel the distributive effects of a progressive spending system. Bird and Zolt (2015), by studying the inequality in Latin America, show that regressive taxation, low tax burdens, and systems that ineffectively tax the rich, are in the core of Latin America's high inequality rates.

Despite this reality, tax policies are usually overshadowed by other policy variables in studies concerning spending policies, such as those focused on welfare states (BERAMENDI; RUEDA, 2007). The lack of attention in political science to the impact of taxation to reduce inequality is caused, in part, by the difficulty in measuring tax progressivity (PRASAD; DENG, 2009). Data on income and wealth pre and post taxation, ideal for the analysis of tax progressivity (MORGAN, 2018), is very rare, specially for time series cross section analysis. As a consequence many scholars have seeked to adopt alternative measures as proxy for tax progressivity.

Different taxes present specific impacts on the overall progressivity of tax regimes. The share of income taxes has been the more commonly adopted measure, however with few or no testing of its fitness as a proxy for progressivity (PRASAD; DENG, 2009). The work of Prasad and Deng (2009) is a central contribution to the issue, by testing the correlation between different classes of taxes and the progressivity of regimes they show that only the share of good and service taxes on revenue are a reliable measure of progressivity, presenting consistent negative correlation to it.

I propose that these recent findings must be considered, and consumption taxes as a share of revenue as a proxy for tax progressivity should be used in empirical studies as a preferred metric. In contrast, with the inconclusive correlation to tax progressivity, income taxation should not be the main measure adopted to test the effects of democracy on tax systems. I use both measures in this study. The first measure, consumption taxes share of revenue, includes taxes on goods and services, sales and value added taxes, taxes on services and on the use of goods or property. The second, income taxes share of revenue, includes taxes on the income of individuals, on the profit of corporations and on capital gains. I also propose a third measure, the ratio between income and consumption taxes, as proxy for

tax progressivity. This measure is important for capturing the balance between two opposite types of taxes, and because it has been defended to be a proxy for progressivity Martinez-Vazquez, Vulovic, and Liu (2009).

The adoption in this research of proxy measures for progressivity, a challenging concept from a measurement point of view, allows for a much broader analysis, that includes not only a large amount of countries (up to 69) but also for a large span of years, 47 years of data for 30 countries and at least 25 years for the other 40. This means that it is possible to analyze not only the before and after effects of democratization (which is not the focus of this study) but to study the long-run effects of cumulative years in democracy on the progressivety of tax systems. For this reason, I adopt a time series cross section approach, so that not only country variation but also dynamics are taken into account. Using an autoregressive distributed lag model (DE BOEF; KEELE, 2008), I further explore if there are differences depending on specifications that explore pooled, fixed or heterogeneous effects.

By proposing to adopt consumption taxes share of revenue as proxy for tax progressivity, I show that most of the inconclusive results of the effects of democratization on tax progressivity are results of the adoption of income taxes instead of consumption taxes as a measure. Nonetheless, I show that the effects of democratization on progressivity, are consistently significant regardless of heterogeneity and of model specification, but remain substantively small.

In the next section, I review the most pertinent studies that have analyzed democracy's effect on inequality and taxation and on how to measure tax progressivity. In the following section, I present my hypotheses and empirical strategy. In section four, I analyze the data and discuss the most appropriate methods for testing my hypotheses. In section five I show the results and their implications. Finally, I summarize the findings and discuss further developments in the conclusion.

2 Review of Literature

A central literature that offers important insights as to why democratization might contribute to improvements in inequality builds on the work of Meltzer and Richard (1981), who propose a theory of the median voter. In this theory, democratization and the increase of suffrage positively impacts the size of the state by increasing taxes and, as a consequence, decrease income inequality. Several studies have sought to empirically test this theory, but consensus regarding the impact of democratization on taxation and inequality remains unresolved. As I will discuss briefly in this section, these studies have largely focused on specific mechanisms within democracies that might help to trigger greater reductions in inequality. Specifically, scholars have directed significant attention at the level of information of voters, the impact of enfranchisement, and the role that specific institutions in democracies and how these might lead to transformations in taxation and welfare spending.

Recent empirical studies, with new and novel data and innovative methodological approaches, tend to find that the increase in political participation does not always lead to the reduction of inequalities (ACEMOGLU; ROBINSON, 2015; BORGE; RATTSØ, 2004; CAPLAN, 2007; PIKETTY; GOLDHAMMER, 2014; HACKER; PIERSON, 2010). In part this is because these recent studies question some of the restrictive assumptions of the classic Meltzer and Richard theory (CAPLAN, 2007). For example, Bartels (2005, 2008) weakens the assumption of well informed voters showing that voters positions on tax policy are contradictory from their spending and social desires, evidencing voters do not comprehend the characteristics of specific tax reforms proposed and are incapable to form a coherent opinion on such reforms.

A series of empirical studies contest another classical assumption of Meltzer and Richards that increasing the share of enfranchised citizens would increase taxes and the size of government which would then lead to a decrease in inequalities (ACEMOGLU; ROBINSON, 2015; AIDT; JENSEN, 2009b; BORGE; RATTSØ, 2004). Aidt and Jensen (2009b) show that suffrage has a non linear effect on tax progressivity, conditioned on the percentage of the population enfranchised. They show that suffrage that includes low and moderate percentages of the population reduces tax progressivity, despite the median voter having income inferior to the national average. The authors show suffrage only has a redistributive effect on income when the share of the enfranchised increases and approximates to the totality of

the adult population. Borge and Rattsø (2004), show evidence that is contrary to the median voter theory expectations at the sub national level, Acemoglu and Robinson (2015) show that democratization increases inequality in countries with high land inequalities and in contexts where the middle class has incomes closer to the rich (rather than to the poor). However, and Acemoglu and Robinson show that the increase in suffrage brings an increase in the size of state and of taxes, but this increase is not necessarily related with a reduction of inequality. In this sense, there findings are in the same direction as pointed by Meltzer and Richard.

In an even more conflicting direction Albertus (2013) argues that competition between elites and uncertainty on succession can lead to redistribution inside autocracies that is potentially more progressive than observed in democracies. Albertus and Gay (n.d.) show that most autocrats do not last more than five years, and that they are more commonly succeeded by other autocrats, rather than by democratically elected successors. This uncertainty can lead autocrats to seek support of the population in fear that their potential successors are negotiating with elites for its removal. Also, elites can favor democratization in order to avoid such uncertainty. Albertus shows that the mechanisms of wealth distribution in autocracies, and its relation to democratization, are complex and involve many political elements.

In the case of Brazil, Ferreira de Souza (2017) shows that, in almost a century, the variations on political institutions did not change the percentages of wealth concentrated on very few rich citizens. In contrast, Arretche (2018) shows that the recent democratization that started in the 1980's reduced inequality in a consistent manner, by including outsiders as beneficiaries of public services (RUEDA, 2005). Furthermore, Arretche shows that this reduction happened despite the adoption of many regressive tax reforms. It bears noting, however, that the inflection in equality is not caused by enfranchisement, but by social policy reform that occurs decades after enfranchisement. In this sense, these findings can be interpreted as suggesting a possible pathway of how democratization affects inequality. With her study, Arretche shows that democratization can consistently reduce inequality, even with a complete disregard for increasing the progressivity of tax regimes, the effects of democratization on inequality are, she argues, not automatic, and demand social mobilization and electoral pressure.

For Gilens (2012), political organizations, especially parties, are vote-seeking, rational actors, that respond to the pressure of voters. Democracy, they argue, should have a

distributive impact, by allowing parties and governments to respond to the desires and needs of the population, by allowing political competition and the improvement of all types of policies. Authoritarian regimes, on the contrary, repress organizations and do not allow for the emergence of organized interests by the population. In this sense, political freedom of organization, not only elections, is what matters for democracies to be able to bring income and wealth leveling. Since organization is seen as the way to reach power, democracy, by allowing organization of social groups, is the condition for the implementation of distributive policies. Gilens defends that winning policies do not emerge from the aggregation of individual and independent preferences, but from political organization. This means that the capacity for organizing preferences and pressuring for their approval is crucial. Power requires organization, and no power emanates from independent and unconnected preferences.

The work of Fairfield and Garay (2017) sheds further light on the distributive effects of democratization on inequality by specifically focusing on the linkages between welfare expansion and taxation in the context of developing democracies. The authors focus on examining the effects of electoral pressure on the approval of progressive tax reform. For these authors, social programs that provide tangible benefits naturally tend to draw greater interest and support from lower-income groups than taxes targeting economic elites, which have no visible, direct effect on lower-income citizens. For this reason, it is harder for tax policies to emerge as central in the electoral and democratic mechanisms of pressure for the implementation of policies. But, the authors say, there are contexts that can make tax policies more "visible".

> Emergence of public debate on taxation in connection with active demands for social programs may raise the salience of progressive taxation and generate greater public understanding and support for such initiatives. (FAIRFIELD; GARAY, 2017, p. 7)

But even in contexts of high mobilization of the public debate around progressive tax reforms, the authors argue that the actual effects on tax progressiveness are minor, especially so if businesses are strong and have multiple sources of power. If on the one hand the authors agree that political competition and the demands of voters create pressure towards distributive taxation, they disagree that this mechanism suffices to bring reforms that significantly deviate from business interest. Even though there can be an expectation that democratization may

progressively impact taxation, the impact is a minor one, constrained by the action of the economic elite.

Fairfield and Garay show that, especially regarding taxes, electoral pressure can have limited or no impact on progressive policies. Fairfield (2015), by analyzing Latin American countries, defend that many factors can allow politicians to achieve electoral success without deviating from business interests, thus limiting electoral pressure on progressive policies, such as taxation.

> Many factors mitigate the countervailing pressure of public opinion; strong partisan identities, crosscutting voter preferences, charismatic linkages, and clientelism all create opportunities for politicians to win votes even if their policy positions on issues that matter to business deviate from median-voter preferences. In the realm of taxation, public opinion has had only marginal effects in Latin America when business power is strong, even on high salience issues like Chile's 2005 copper royalty initiatives.(FAIRFIELD, 2015, p. 426)

Since I expect that the environment for political organization is the mechanism that democratization brings and that impulses the reduction of inequalities, I focus on the stock of democracy, rather than on transitions or democratic status. Many studies show that the economic and distributive effects of democratization take time, showing the duration of democratic periods matter. Acemoglu, Naidu, et al. (2019) show that time after democratic transitions and persistence in democracy matters, showing that on average countries that transition present a 20% higher GDP per-capita than those that remain non-democracies. Eberhardt (2021) also shows that democracy has long-run impacts on growth. Papaioannou and Siourounis (2008) show positive effects of democratization on growth by looking at the decades before and after transitions.

As this brief review of the literature has attempted to show, there are more complex longer-term dynamics that need to be evaluated to assess the effects of democracy on taxation and inequality. Democracy institutions impact tax policies from design to implementation, and there is a lack of studies carefully looking at this relation (GOULD; BAKER, 2002). Democratization emerges as a mechanism in very diverse senses, sometimes reducing inequalities effectively, but in other cases, it is shown to be insufficient to provoke these changes and depending on other varying factors. As this review has attempted to emphasize, the majority

of studies emphasize the effect of democratization on inequality with reduced attention to taxation, even more so, I argue, regarding the determinants of the progressivity of regimes. It is to this gap in the literature which this study seeks to contribute.

3 Hypotheses and Empirical Strategy

In seeking to contribute to the study of the determinants of inequality, I explore the effects of the stock of democracy on the progressivity of tax regimes. I use the cumulative years of democratic regime status to understand the role of increasing suffrage and of prolonged political organization and electoral pressure on the progressivity of regimes. I expect democratization to have a positive effect on tax progressivity that is related to cumulative years in democracy.

The main hypothesis I test is that democratization is positively correlated with tax progressivity, but that it is not regime status itself, but rather the persistent and long-term dynamics within democracy that generate progressive tax reforms. I make an effort for diversifying the measures of tax progressivity in order to explore if the statistical results regarding this relation are robust to different measures.

There are conflicting views on the progressivity of specific classes of taxes, and authors have adopted many different measures to tax progressivity (CUSACK; BERAMENDI, 2006; PIKETTY; SAEZ, 2007). The key debate is based on a major contribution to tax progressivity literature, the work of Prasad and Deng (2009), who undertake an in-depth analysis of the literature aimed at analyzing different measures of tax progressivity, and using these to empirically verify which are more precise in terms of measurement. By testing specific tax classes as a share of revenue as proxy for tax progressivity, the authors disagree with the majority of authors, in the belief that income taxes are good measures of tax progressivity, and defend that taxes on goods and services are a much better measure:

it is a mistake to assume that income taxes and property taxes are always progressive: there are examples of regressive income taxes in the data, and property taxes are almost always regressive in this sample. Payroll taxes tend to be regressive, but we find a progressive payroll tax on two occasions. The only tax that lives up to its reputation is sales tax, which is regressive in every country, for every year. The role of sales taxes in the tax structure also correlates well with our measure of regressivity, and so we suggest that the role that sales tax plays in the revenue structure is an acceptable proxy for the degree of regressivity of

a tax structure in cases where more detailed data are not available (PRASAD; DENG, 2009, p. 433).

The authors show that consumption taxes are consistently regressive. This is a major contribution, since it is the only structured empirical testing of measures for progressivity, and it shows sales taxes, which have been rarely applied as measures for the progressivity, to be the best measure, while income or property taxes have been more frequently used. Recognizing their contribution, I here adopt the share of good and service taxes as my main measure of tax progressivity (regressivity). Based on this argument, I propose my first hypothesis.

H1: Democratization increases progressivity of tax systems, measured by consumption taxes.

To show that income taxes should not be the main tax class used as a proxy for progressivity, I adopt the share of taxes on income as a second measure of progressivity, expecting its results to be less clear and consistent than those related to sales taxes. Aidt and Jensen (2009b) defend that income and property taxes have a progressive impact on tax structures. They argue that inheritance taxes are progressive by design, but other taxes on income and property have a more complex effect. Despite adopting income and property taxes as measures of progressivity, the authors admit such taxes are potentially regressive, since higher income citizens have more tools to avoid taxation. To defend the adoption of such taxes as measures, Aidt and Jensen argue they have been historically progressive due to exempting low income citizens from paying any income taxes at all, supporting this claim in qualitative analysis only. They cite Webber and Wildawsky (1987) study on Sweden as an example of the progressiveness of income taxes:

In Sweden, for example, a personal and corporate income tax was introduced in 1902. It applied an exemption for the first 1,000 kroner at a time when the average income was 992 kroner. This exempted most individuals, while requiring wealthy individuals to pay as much as 12% of income in taxes (WEBBER; WILDAWSKY, 1987).

By using the share of income taxes as a proxy for progressivity, Aidt and Jensen (2009b,a) show that more suffrage would increase taxation and the size of government, and

that democratization shifts tax revenue toward a greater emphasis on income taxes, but only when the cost of taxing is low. Following such studies, I test the effect of the stock of democracy on the share of income taxes on tax revenue. Again, I test the hypothesis of democracy increasing tax progressivity, but here with a different expectation, since I expect income taxes to be a less precise measure of progressivity, results should be less significant.

H2: Democratization does not increase the progressivity of tax systems, measured by income taxes.

Also, I propose a third measure, that is a consequence to the first two: The ratio between income and consumption taxes. The proposed variable is a measure of the size of income taxes relative to the size of sales taxes, and aims to summarize the balance of these too taxes, that the literature usually adopts as measures of progressivity and regressivity. Since the numerator is expected to be positively correlated to progressivity and the denominator to regressivity, the resulting index should be strongly correlated to progressivity.

Martinez-Vazquez, Vulovic, and Liu (2009) show that the ratio between direct and indirect taxes is related to GDP growth and to inequality. While systems with more direct and less indirect taxation can lead to less efficient economic growth, they are correlated to larger states and less inequality. Thus, despite limiting my ratio to specific kinds of direct (income taxes) and indirect (sales taxes), it would be expected to represent a good proxy for progressivity and inequality reduction. However, and following the findings of Prasad and Deng (2009), I expect it to be still an inferior measure than the share of consumption taxes, with results less consistent, due to the presence of income taxes in its formula. Thus I present a third hypothesis:

H3: Democratization does not increase the progressivity of tax systems, measured by the ratio between income and consumption taxes.

I adopt this third measure as an additional test because, if measures two and three present results similar to those of measure one, than the importance of choosing consumption taxes preferably is diminished. On the other hand, if results differ much, and considering that only good and service taxes have strong empirical evidence to ground its adoption as defended by the work of Prasad and Deng (2009), the argument for the adoption of sales taxes

as proxy for progressivity and the need to further analyze the quality of measures become stronger.

4 Data and Methods

For the empirical testing of the hypotheses of democratization increasing tax progressivity, I employ World Bank (2020)[1] World Development Indicators data on tax income. Data is available for 30 countries from 1972 to 2019 and, if restricted to 1990 to 2019, for 69 countries. The need to understand the income of the very rich makes taxation data, even when tax structures are not the main focus of studies, the best data for analyzing inequality (PIKETTY; GOLDHAMMER, 2014; MEDEIROS; CASTRO, 2019). In this study, where we aim to understand tax systems, the World Bank tax data is a valuable resource.

Tax progressivity is a complex subject to measure. Ideally, it would be calculated as the difference of the inequality pre and post taxation. This type of data, however, is rare and hard to find, especially for use in time series cross section. For this reason, alternative measures of tax progressivity that effectively substitute more precise calculations are needed.

I will seek to test the hypothesis that democracies, by producing pressure for income leveling, should increase the progressivity of tax systems. With a time series cross section analysis of 69 countries from 1972 to 2019, I will test whether democratization produces immediate and long-run effects on tax progressivity. I will use three definitions of tax progressivity: a) the percentage of consumption taxes as a measure of tax regressivity; b) the share of income taxes on total revenue as a measure of progressivity; and, c) the ratio between the shares of income and consumption taxes on total revenue. This final measure is an indicator of the size of income taxes in comparison to the size of consumption taxes, and is argued to be highly correlated to progressivity since both measures are, individually, expected to be correlated with it on opposite manners (MARTINEZ-VAZQUEZ; VULOVIC; LIU, 2009).

As I will show in the next section, a descriptive analysis of the data, democratization seems to positively impact progressivity. But countries share many covariates that could work as omitted variables and bias our results. To account for these factors and also examine the long-run effects of democracy, I estimate an Auto Regressive Distributed Lag Model (ARDL) since I need lags of the dependent variable to solve residual auto-correlation and unit root

---

[1] World Bank Data Set resorts to International Monetary Fund, Government Finance Statistics Yearbook and data files.

problems, as shown in table 6 in the Appendix. Table 6 summarizes the unit root test results for the three dependent variables, as suggested by Eberhardt (2011), that apply the unit root tests proposed by Im, Pesaran, and Shin (2003) and Maddala and Wu (1999) for cross-section data. The statistical tests therefore suggest that two lags of the dependent variable and no trend must be employed.

The Auto-Regressive Distributed Lag (ARDL) model is summarized as[2]:

$$Progressivity_{i,t} = \alpha_1 Progressivity_{i,t-1} + \alpha_2 Progressivity_{i,t-2} +$$
$$\beta_1 Dem\_Years_{i,t} + \beta_2 Dem\_Years_{i,t-1} + Controls_{i,t} + Controls_{i,t-1} + \varepsilon_{i,t}$$

Five different models of the ARDL are reported in Section 5. First, I estimate a pooled model that allows for the analysis of the more general effect of cumulative democracy on progressivity. Second, I estimate a fixed effects model, by countries, that shows the within country effects of democratization. Third, I report an ARDL with standard errors clustered by country, that allow for more conservative estimation of the overall (within + between) effect of democratization. The fourth model specification includes regional fixed effects, that shows the within regions effects of democratization and thus minimizes the issue of regional omitted variables, also helping to control for regional economic integration (HALLERBERG; BASINGER, 1998). The final and preferred model specification includes an additional control if countries are high or low income.

4.1 Tax Progressivity

Figure 1 shows the general tendency of taxes on consumption for democratic and authoritarian countries, a proxy for tax regressivity. Differences are very small between both, with the exception of a recent tendency for regressiveness on authoritarian countries since 2010 and a slow progressive tendency in democratic countries at the same period. Despite that, overall tendencies are mostly not clear regarding this measure of progressivity. It is important to signal that there is a clear tendency towards an increase in the number of democratic

---

[2]The long-run effects, shown in most figures, represent the total or definitive effect of the explanatory variable on the dependent variable (EBERHARDT, 2021; WILLIAMS; WHITTEN, 2012), and are given by $\lambda = (\beta_1 + \beta_2)/(1 - \alpha_1 - \alpha_2)$.

regimes, represented by the percentage of democratic countries by year (gray bars), over time.

Figure 1 – Consumption Taxes Share of Total Revenue
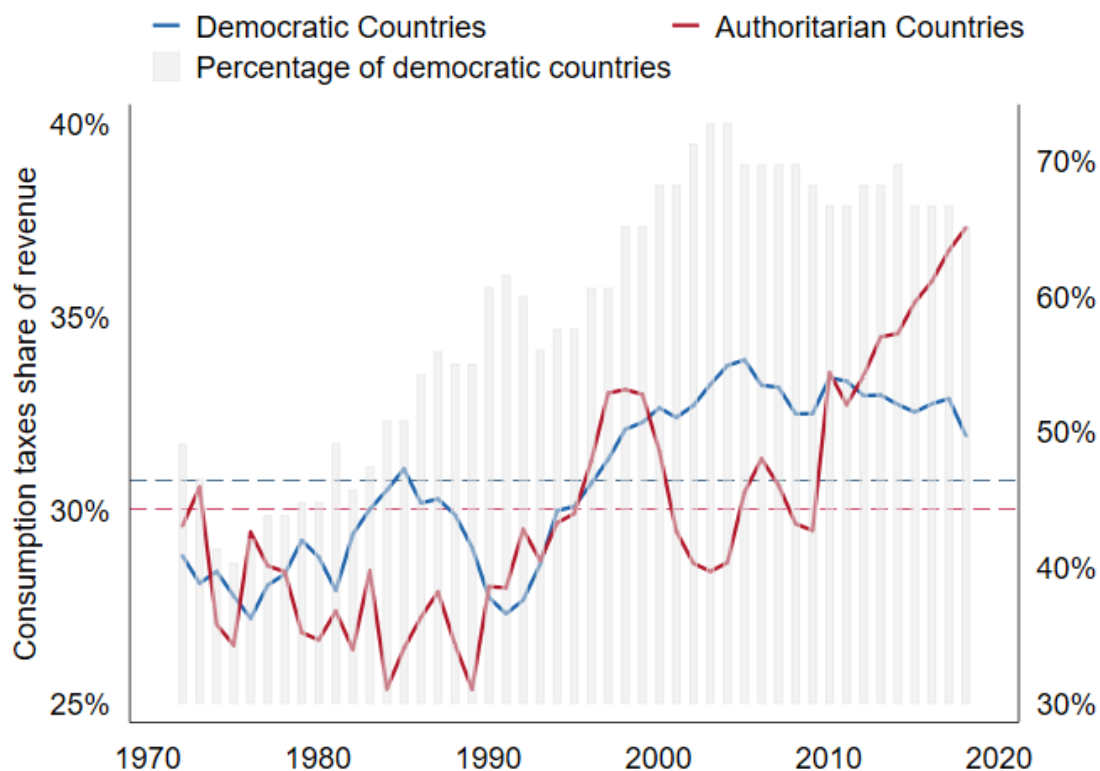
Source: Boix, Miller, and Rosato (2014) Freedom House (2020) World Bank (2020)

When we look at our second measure, the share of income taxes on revenue, a proxy of progressivity in Figure 2, a much different pattern, with democratic countries privileging income taxes on a much more consistent way. In the last decades, there is a tendency for the increase of the share of income taxes on the revenue of authoritarian regimes.

Figure 2 – Income Taxes Share of Total Revenue
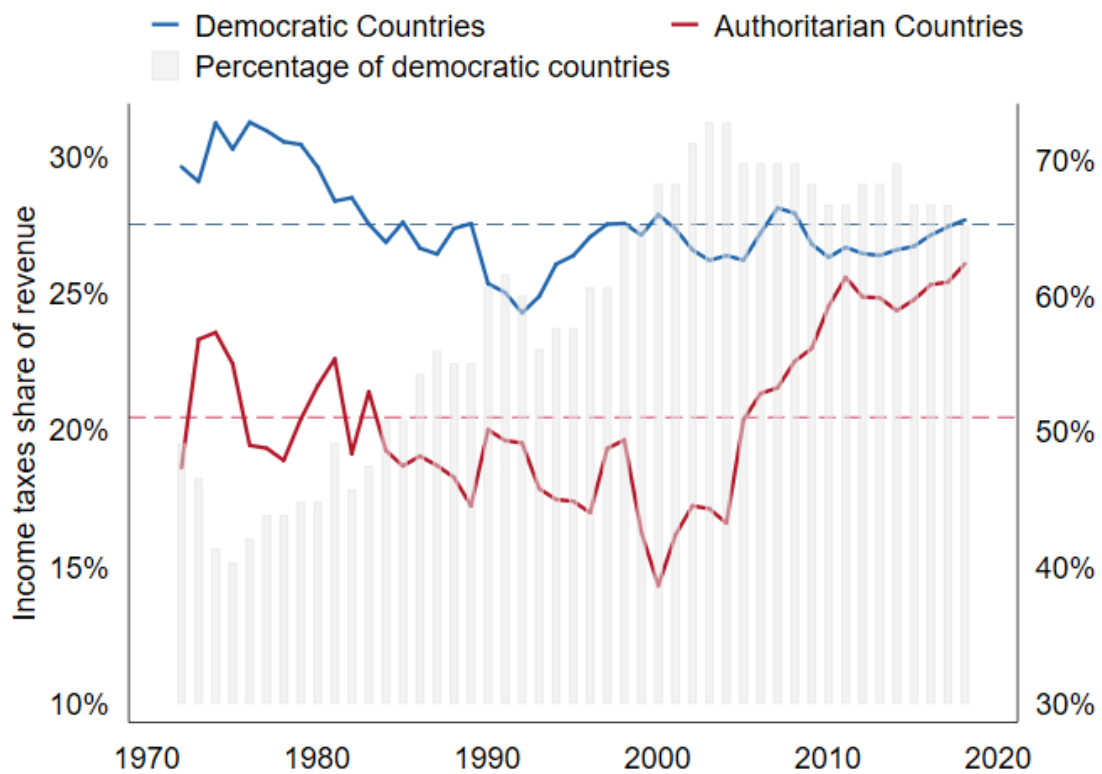
Source: Boix, Miller, and Rosato (2014) Freedom House (2020) World Bank (2020)

Figure 3 shows the third measure, the ratio between income and consumption taxes for democratic and non-democratic countries through time. Here democracy seems to be correlated with progressivity, with the democratic countries being consistently more progressive than the authoritarians. All three figures show either conflicting or progressive effects of democracy on tax progressivity. As I will show in the following sections, mostly when I present the time series models with controls, these averages are misleading. Democracy has a consistent positive effect on consumption taxes, and very inconsistent or null effects on the other two measures.

Figure 3 – Tax Progressivity (Income/Consumption Taxes)

Source: Boix, Miller, and Rosato (2014) Freedom House (2020) World Bank (2020)

As an attempt to visualize the long-run cumulative effect of democracy, I will look at years in democracy as the main explanatory variable. I expect that the effects of democratization, political competition and organization take time to consolidate, and the more time is given for such mechanisms to work, the biggest will be the progressive effect on taxation. Figure 4 shows the expected share of consumption taxes on total revenue by cumulative years of democratic regime status.

Figure 4 – Consumption Taxes and Years in Democracy
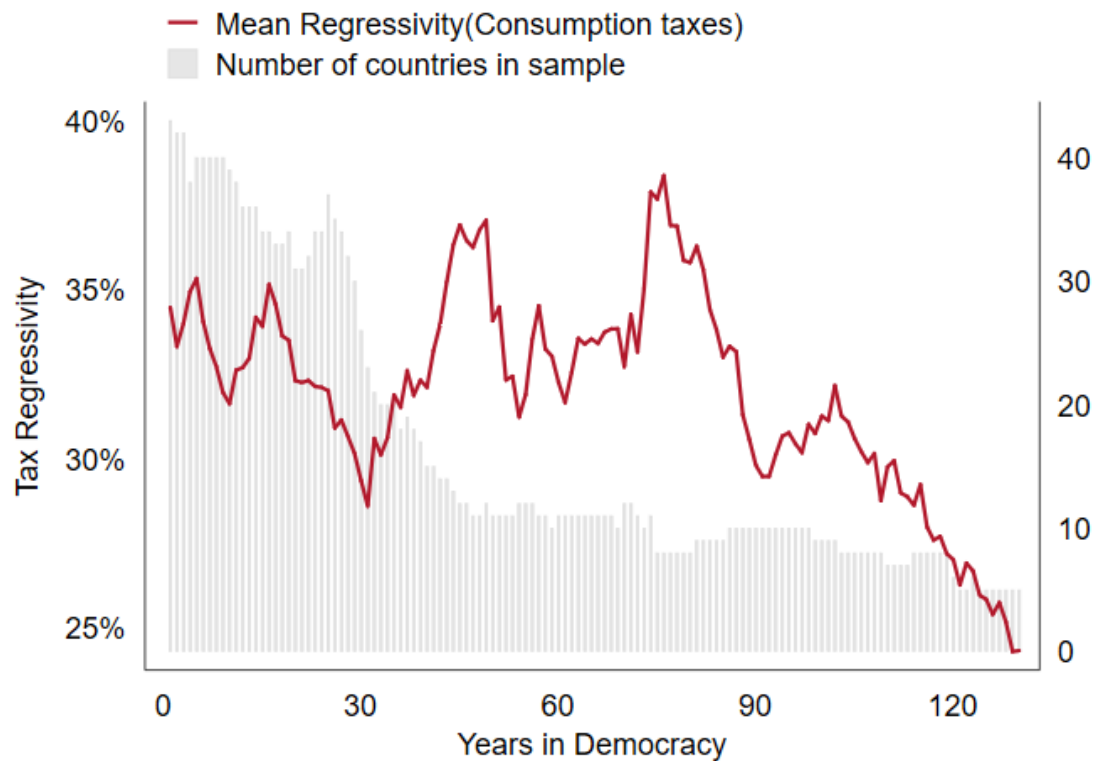
Source: Boix, Miller, and Rosato (2014) Freedom House (2020) World Bank (2020)

The expected regressivity of tax regimes, measured by consumption taxes, seems to decrease the more years a country stays democratic, especially after the 70 cumulative years in democracy threshold. This is also true for our second measure, income taxes, as shown in figure 5 where the tendency seems to be of an increase of tax progressivity, regardless of the period observed.
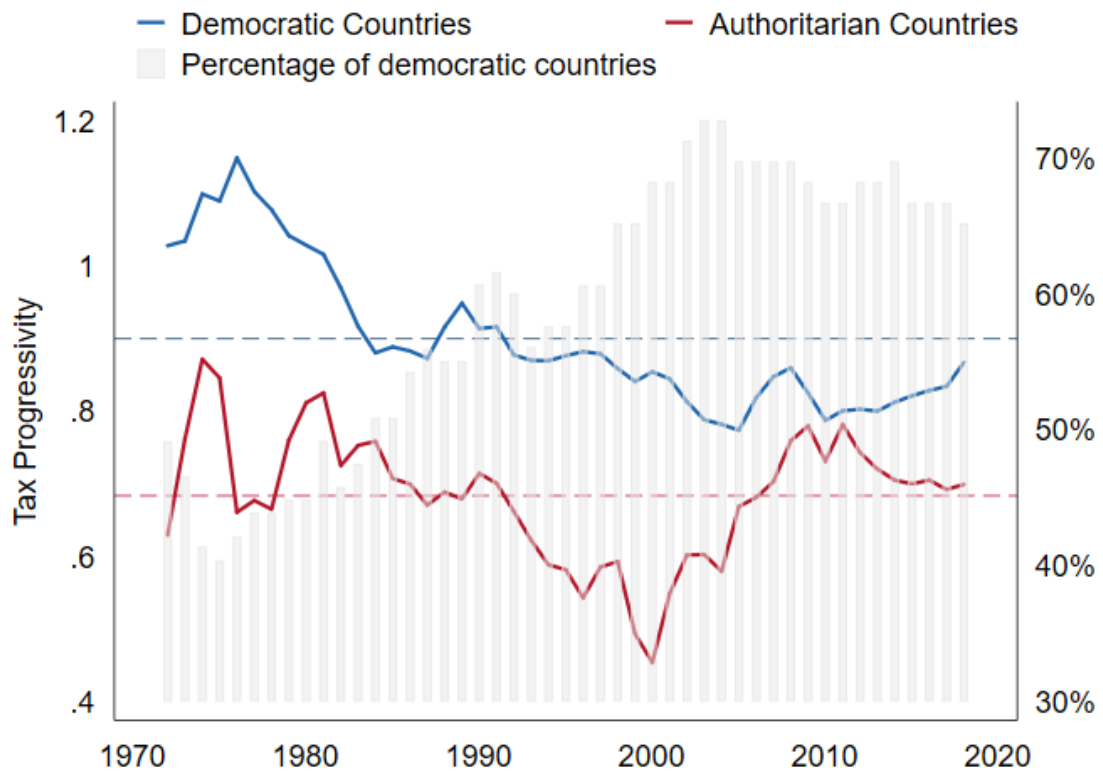
Figure 5 – Income Taxes and Years in Democracy
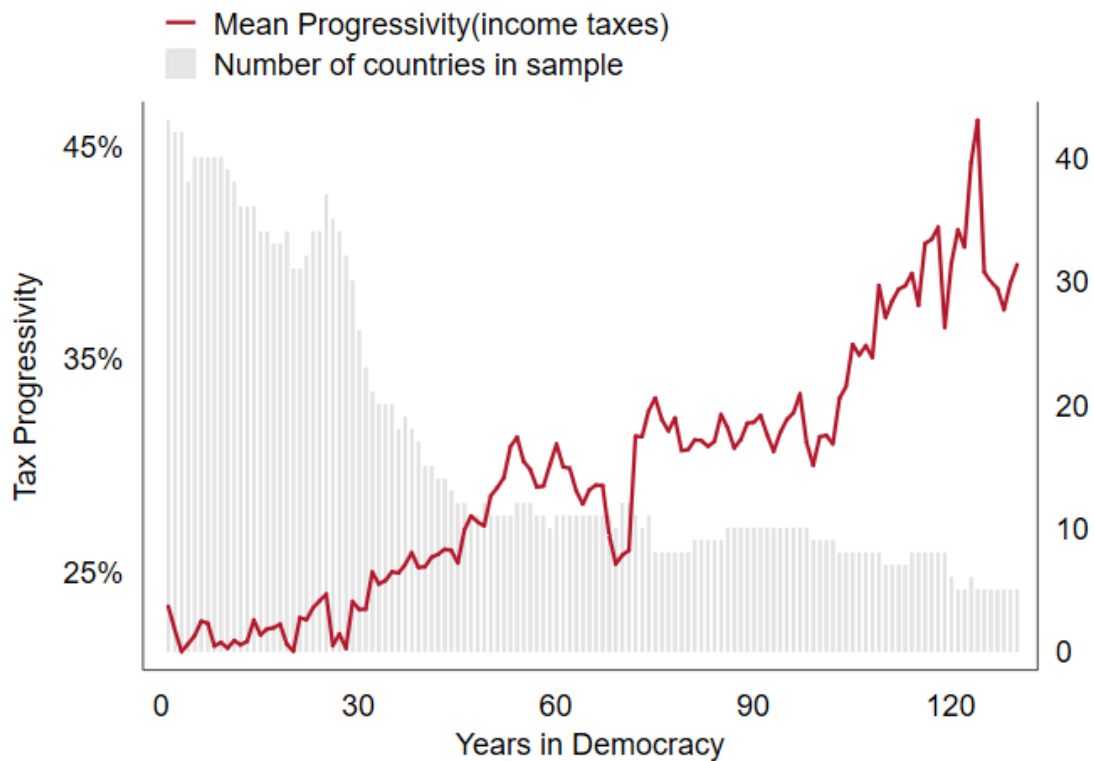
Source: Boix, Miller, and Rosato (2014) Freedom House (2020) World Bank (2020)

Figure 6 shows that our third measure, the ratio between income and consumption taxes, shows the same tendency of a positive correlation between tax progressivity and cumulative years of democratic regime status. Here again, it is important to point out, that not only the number of countries in the sample falls as the stock of democracy increases, but also this data is very susceptible to time trend biases, which must me taken into consideration in time series modeling.

Figure 6 – Income-Consumption Taxes Ratio and Years in Democracy
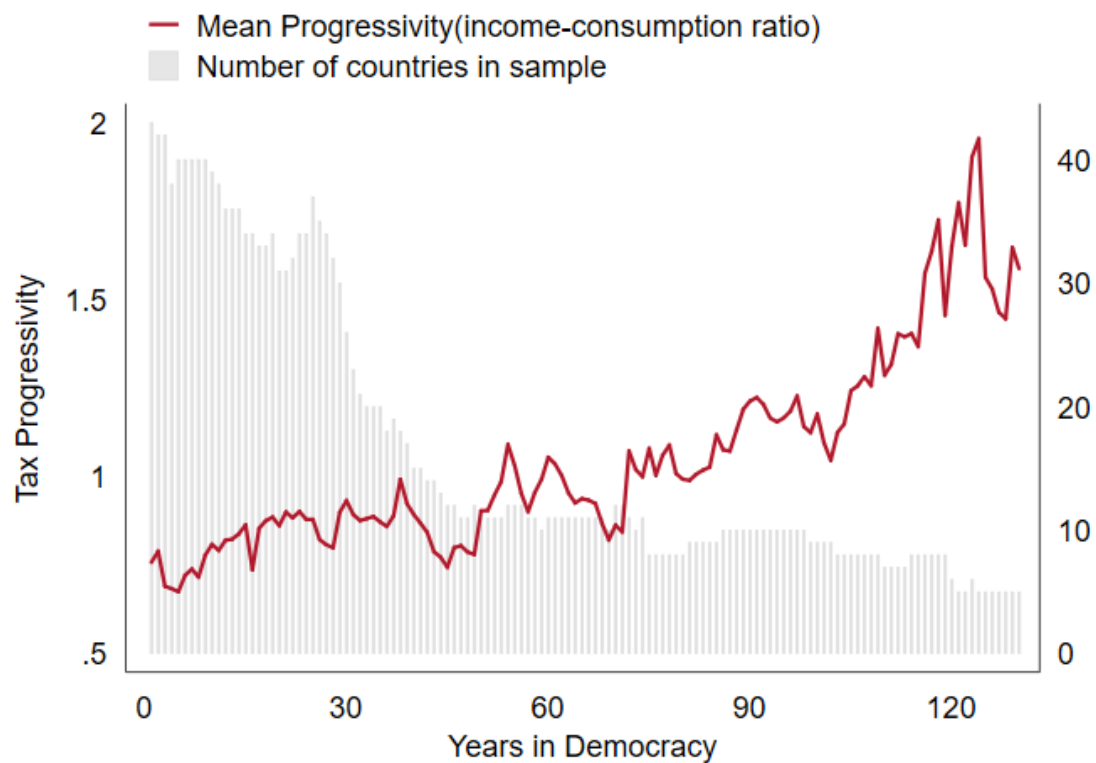
Source: Boix, Miller, and Rosato (2014) Freedom House (2020) World Bank (2020)

4.2 Democratization

For the democracy measures, I rely on the dichotomous measure of Democracy of Boix, Miller, and Rosato (2014) [3] This data source classifies countries in democracies or non-democracies based on the election of political leaders and on thresholds of suffrage[4].

_____

[3]The authors define as democratic a country that has competitive elections and has enfranchised a majority of the male population.

[4]I complement their data, for the period from 2014 to 2019 with data from Freedom House (2020) Freedom in the World. Tables 10, 11, and 12 in the appendix show the regression results without this additional data. Freedom House assigns scores for political rights and civil liberties ratings to 151 countries and 45 territories and categorizes them as Free, Partly Free, or Not Free. To transform their measure into a dichotomous variable, I will work with a transformation of this indicator, calling democratic those countries classified as free or partially free by Freedom House. See https://freedomhouse.org/reports/freedom-world/freedom-world-research-methodology for more detail.

Table 1 shows the observations available for each country, and classifies the countries in three categories: With Transitions, Always Democratic and Never Democratic[5]. It shows that the sample is rich in observations both in time and in variation of the main explanatory variable, with considerable observations for democratic and authoritarian regimes, and also with a good amount of countries that transitioned from one regime to another.

Most observations on the sample are of high income countries that experienced at least one period of democracy. As for our main explanatory variable, years in democratic regime status, this is a very interesting sample. The possible bias that the sample may have in terms of the income of countries demands that I control for high income countries in my models, and I do so by including this specification as part of the models I report and analyze in the results section.

Table 1 – Countries and Observations by Democratic Status

Total Years	Transitioned Regimes	Always Democratic	Never Democratic
25		POL*	MDV
26		CZE*	
27		MNG	BLR
28	HRV* NPL	BLZ EST* LTU* VCT	
29	BRA PHL ROU ZMB	ARG BGR NAM	ETH GTM JOR MAR NIC LKA
31		JAM	BHR*
33			MMR
35	LSO		
37			BTN IRN
38	HUN*	SPA*	
41			EGY TUN
44	IND	POR*	
46	CHL*	ITA* MUS NLD	
47	CYP* DOM DEU* GRC* MLT MEX PER KOR THA TUR URY* IDN ZAF	AUS* AUT* CHE* CRI* FIN FRA ISL IRL ISR JPN* LUX* NOR* SWE* DNK* GBR*	SGP*
48		USA*	

Source: Boix, Miller, and Rosato (2014) Freedom House (2020) World Bank (2020)

*Currently high income countries on World Bank classification.

[5]Tables 4 and 5 in the appendix show the differences for all the countries that transitioned regimes in the time span studied, of the taxation in democratic and authoritarian periods, for income and consumption taxes, respectively.

5 Results

We have seen that overall means and descriptive analysis of the data indicate a positive effect of democracy on tax progressivity, and that cumulative years in democracy seem to increase progressivity consistently, even more so for the weaker measures of tax progressivity (income taxes and the ratio). By modeling time series cross section models, I aim to control for possible covariates and analyze the effects of democratization. Furthermore, these models allow for the analysis of long-term effects, which better represent the relation between explanatory and dependent variables in dynamic models (DE BOEF; KEELE, 2008; WILLIAMS; WHITTEN, 2012).

Table 2 – Long-Run Effects on Tax Progressivity

	(1) Consumption	(2) Income	(3) Ratio
Democracy Years	-0.0927*	0.0916**	0.0456
	(0.0497)	(0.0487)	(0.1503)
Democracy Transition	-25.03191	-44.35346	-0.0564*
	(25.8296)	(28.66533)	(0.0322)
GDP Growth	-0.0053**	0.0102***	-0.0135
	(0.0023)	(0.0029)	(0.0149)
Inflation	0.0131	-0.0416	0.0312
	(0.0234)	(0.0250)	(0.0516)
Controls	Yes	Yes	Yes
Observations	1,633	1,641	1,606
Number of countries	69	69	68

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 2 shows the long-run effects of cumulative years on democratic regime status on progressivity for the preferred models (controling by high income countries), for each measure of tax progressivity[6]. For the first measure (model 1), one additional year in democracy decreases the share of consumption taxes on revenue by 0.09%. For the second (model 2) one additional cumulative year in democratic regime status increases the share of income taxes

---

[6] Tables 7, 8, and 9 in the appendix report all five models(pooled, country fixed effects, clustered by country, region fixed effects, and with a dummy controll for high income) for each measure of progressivity, with the coefficients used for calculating the long-run effects presented in Table 2 and in figures 7, 8, and 9

on revenue by the same 0.09%, while only transitions seem to matter for our third measure, decreasing progressivity, measured by the ratio between income and consumption taxes, by 0.05.

The results of the presented regressions, although statistically significant, show a very limited effect in terms of magnitude. Models 1 and 2 show an extra year in democracy impact the progressivity of tax systems by less than 0.1%, meaning the time needed for democracy to actually cause a significant change in progressivity would be of several decades or centuries. In this sense, these results suggest that there is a statistically significant effect in the long-term, but the substantive significance is not relevant.

To have a more clear picture of the long-run effect of cumulative years in democracy I present, for each dependent variable, the long-run coefficients of years in democracy, in all five model specifications I have conducted: Pooled, fixed effects, cluster standard errors by country, region fixed effects and controlling by high or low income countries. This last model is my preferred model specification, since the data is very heavy on high income countries, making this an important control. I present the results for all models in tables 7, 8, and 9.

Figure 7 shows much more consistent results of significant long-run effects of democracy on tax progressivity. As defended by Prasad and Deng (2009) consumption taxes' share of total revenue is strongly correlated to tax regressivity, which would make this our preferred model according to their work. Additional years in democracy are related to a decrease on consumption taxes of around 0.1% to 0.2%. The coefficient on democratization in these different models each have a distinct interpretation. Fixed effects models, for example, consider only within country variation, which means that only the cumulative effects of additional years in democracy for each country is considered, ignoring the differences between the stock of democracy between countries.

More broad models, such as pooled or clustered standard error models, allow between country variation to impact the coefficients, meaning that not only every national process matters, but national differences on stock of democracy too. Also, model that control for groups of countries (regions or income groups) search to diminish the possible heterogeneity biases, still allowing between country variance to matter.

The fact that the effects of democracy on the share of consumption taxes on revenue are of consistent significance and size, throughout all models, is a very robust finding. Adopt-

Figure 7 – Long-Run Effects on Tax Regressivity of Cumulative Years in Democracy (Consumption Taxes)
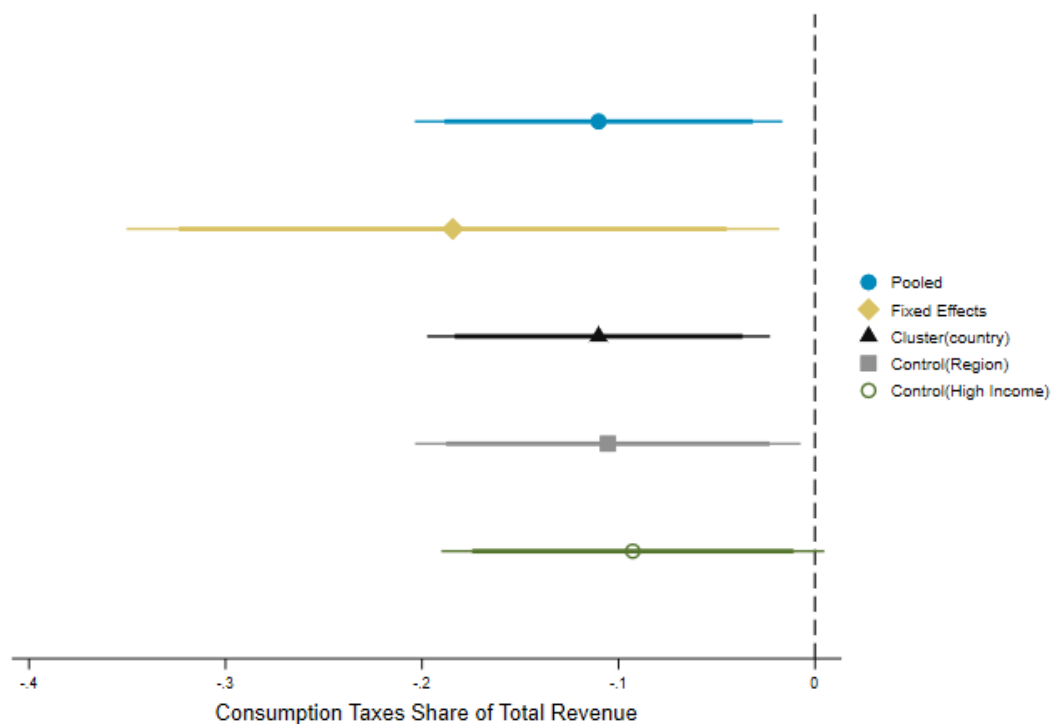
ing this class of taxes as a proxy, and I argue it is a good one, the effect of additional years in democracy on tax progressivity, although minor, exists.

Figure 8 shows the coefficients of cumulative democratization are positively correlated to the share of income taxes on total revenue, only when controlling by income groups, with an additional year in democracy increasing in 0.1% the share of income taxes on total revenue. This is indeed my favorite specification, as argued, due to possible bias on the data selection, since richer countries tend to have better data for a larger span of years.

Although all coefficients are positive, indicating a progressive effect of the stock of democracy, results with the second measure are less consistent, and most models show no significant effects of democratization on the share of income taxes. This shows not only that the relation between years in democracy and different tax classes is complex, but also that the choosing of different types of taxes significantly impact results.

Figure 8 – Long-Run Effects on Tax Progressivity of Cumulative Years in Democracy
(Income Taxes)
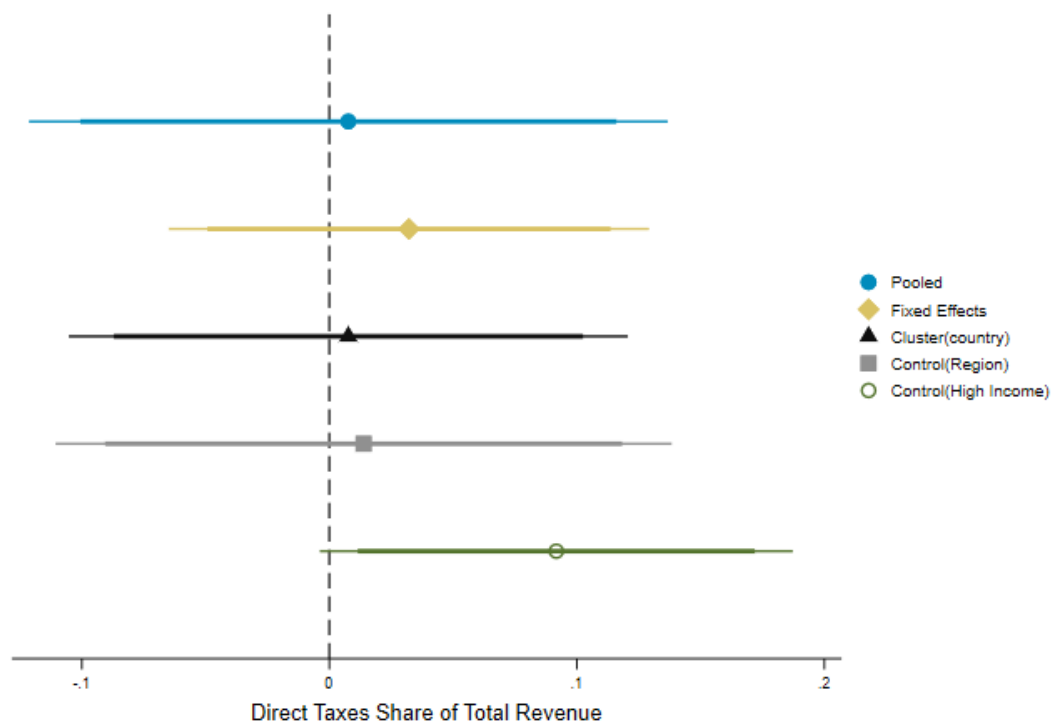
Figure 9 shows no significant coefficients for years in democracy, but is, as all the other models, very consistent on the positive coefficients related to democratization. The fact that income taxes and the ratio of taxes proposed do not present consistent and robust relation with democratization contradicts the expectations that overall means and descriptive analysis made in chapter 4. Consumption taxes, that descriptive figures indicated to have a much complex relation to democratization, showed to be in fact consistently correlated to it, after carefully controlling for important covariates.

Figure 9 – Long-Run Effects on Tax Progressivity of Cumulative Years in Democracy (Income-Consumption Ratio)
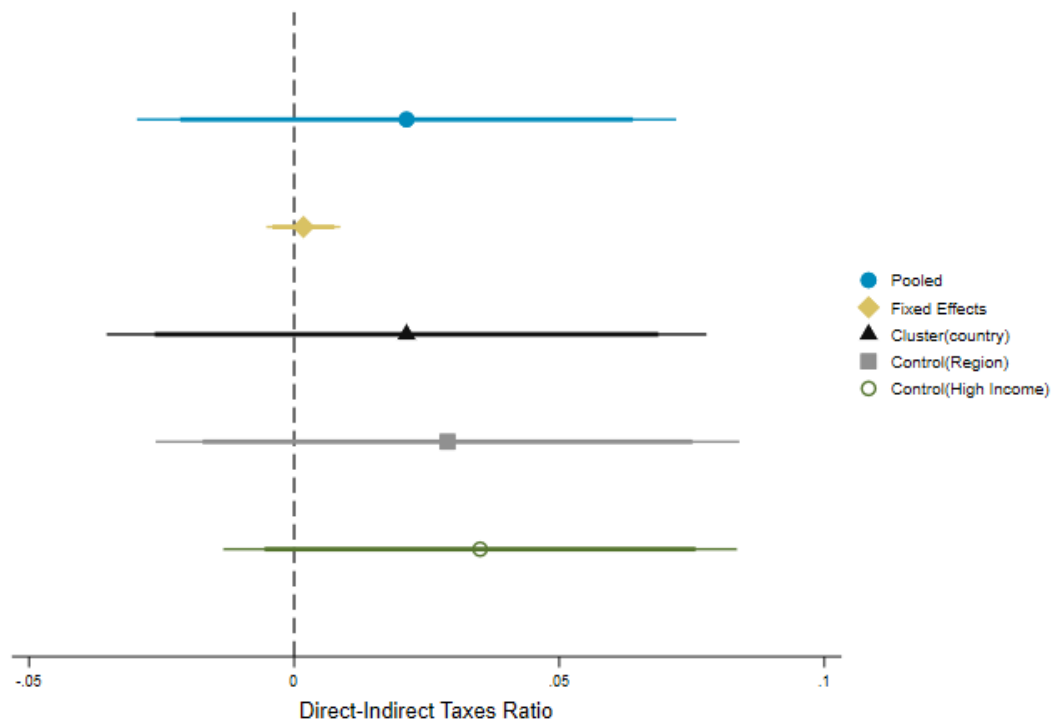
Table 3 shows the summarized findings for each of the three hypothesis proposed, and the review of the robustness of the results in face of different model specifications. It is important to notice that, in all models, the substantive size of the coefficients is very small, and only many cumulative years of democracy can substantially impact tax progressivity. Countries vary substantively on the composition of their tax revenue, and years in democracy, despite presenting significant effects on the share of some of the components, has a very limited substantial impact, limiting its explanatory power to explain such variation. The small or insignificant effects seen in fixed effects models also show that democratization has limited capacity of changing a country's tax progressivity. This, along with the fact that within country variation on tax composition is small, indicates that tax systems are, indeed, very path dependent.

Table 3 – Summary of Hypotheses and Research Findings

Hypotheses	Findings (in preferred model specifications)	Degree of Robustness
H1: Democratization increases progressivity of tax systems, measured by consumption taxes.	The effects of democracy on tax progressivity are positive and consistent, but substantively minor.	Robust for all model specifications.
H2: Democratization does not increase the progressivity of tax systems, measured by income taxes.	The effects of democracy on tax progressivity are positive, inconsistent, and substantively minor.	Not robust for all model specifications, significant only for with preferred specification (controlling by country income level).
H3: Democratization does not increase the progressivity of tax systems, measured by the ratio between income and consumption taxes.	No significant effects for the stock of democracy on progressivity.	The effects are non-significant for all specifications.

6 Conclusions and Next Steps

In this dissertation, I have argued that consumption taxes as a share of total revenue are a good proxy for tax regressivity. I have shown the stock of democracy matters for the average share of consumption taxes on total revenue. Although results indicate positive effects of democracy on progressivity, the effects are only minor, and limited on its capacity of explaining variation, especially the wide variation between countries.

Decades of democracy would, on average, imply single digit changes in the percentage of each tax in terms of revenue share. Thus, similar to the findings of Papaioannou and Siourounis (2008) for economic growth, this study suggests that democracy can only act as a substantive factor on tax progressivity in a longer time horizon. Countries vary much more substantially in terms of tax structures. This means that, although democracy matters, tax systems seem to be strongly path dependent. Studies on the determinants of the timing of the adoption of different tax structures (AIDT; JENSEN, 2009a; MORGAN; PRASAD, 2009; EINHORN, 2009) may bring light to the issue. The democratic status of countries on the moment of such implementations may, for example, be an important determinant. Also, with the recent global health crisis, novel tax data present a valuable opportunity for testing the thesis of catastrophic events as the only relevant income and wealth levelers in history, proposed by authors such as Piketty and Goldhammer (2014) and Scheidel (2017).

I argue that, the choice of different types of taxes as proxy for tax progressivity needs to be a careful one. Only consumption taxes have strong empirical evidence to be a proper measure of progressivity, and other classes of taxes need further empirical justification to be employed with confidence. Results change when different taxes are adopted, thus making this choice a very delicate one. The need of alternatives to the scarce pre- and post-tax inequality data shoud not substitute the need of different measures to be carefully evaluated for their conceptual precision.

Finally, the arguments of Fairfield and Garay (2017), on the obstacles to progressive tax reform, even when there is electoral pressure for such policies, seem to find evidence in the data. Not even long periods of democracy seem to substantially change the distributive nature of tax systems. Democracy is, as a consequence of such findings, insufficient to un-

derstand the wide variety of progressivity of tax systems around the world. Undoubtedly, there are many other factors that may mediate democracy's impact on inequality and taxation. For example, it might be interesting to explore if democracies ruled by left wing parties (HUBER, 2012; ROBERTS, 2012) for several decades produce substantively different tax outcomes. Future studies should be directed at exploring questions such as these in further depth.

References

ACEMOGLU, Daron; NAIDU, Suresh, et al. Chapter 21 - Democracy, Redistribution, and Inequality. In: ATKINSON, Anthony B.; BOURGUIGNON, François (Eds.). **Handbook of Income Distribution**. [S.l.]: Elsevier, 2015. v. 2. (Handbook of Income Distribution). P. 1885–1966. DOI: https://doi.org/10.1016/B978-0-444-59429-7.00022-4. Available from: <https://www.sciencedirect.com/science/article/pii/B9780444594297000224>.

_____. Democracy Does Cause Growth. **Journal of Political Economy**, v. 127, n. 1, p. 47–100, 2019. DOI: 10.1086/700936. Available from: <https://doi.org/10.1086/700936>.

ACEMOGLU, Daron; ROBINSON, James A. The Rise and Decline of General Laws of Capitalism. **Journal of Economic Perspectives**, v. 29, n. 1, p. 3–28, Feb. 2015. DOI: 10.1257/jep.29.1.3. Available from: <https://www.aeaweb.org/articles?id=10.1257/jep.29.1.3>.

AIDT, Toke S.; JENSEN, Peter S. Tax Structure, Size of Government, and the extension of the vote Franchise in Western Europe, 1860-1938. **Springer Science**, v. 16, p. 362–394, 2009. DOI: https://doi.org/10.1007/s10797-008-9069-9.

_____. The taxman tools up: An event history study of the introduction of the personal income tax. **Journal of Public Economics**, v. 93, n. 1, p. 160–175, 2009. ISSN 0047-2727. DOI: https://doi.org/10.1016/j.jpubeco.2008.07.006. Available from: <https://www.sciencedirect.com/science/article/pii/S0047272708001229>.

ALBERTUS, Michael. Explaining Patterns of Redistribution Under Autocracy: The Case of Peru's Revolution from Above. **Latin American Research Review**, 2013. DOI: http://dx.doi.org/10.2139/ssrn.1848124.

ALBERTUS, Michael; GAY, Victor. Unlikely Democrats: Economic Elite Uncertainty under Dictatorship and Support for Democratization. **American Journal of Political Science**, v. 61, n. 3, p. 624–641. DOI: https://doi.org/10.1111/ajps.12277. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/ajps.12277>.

ARRETCHE, Marta. Thirty Years with the 1988 Constitution: Do We Have Reasons to Celebrate? **Novos estudos**, CEBRAP, v. 27, n. 3, p. 395–414, 2018.

BARTELS, Larry M. Homer Gets a Tax Cut: Inequality and Public Policy in the American Mind. **Perspectives on Politics**, [American Political Science Association, Cambridge University Press], v. 3, n. 1, p. 15–31, 2005. Available from: <http://www.jstor.org/stable/3688108>.

_____. **Unequal Democracy: The Political Economy of the New Gilded Age**. STU - Student edition. [S.l.]: Princeton University Press, 2008. ISBN 9780691146232. Available from: <http://www.jstor.org/stable/j.ctt7t9ks>.

BERAMENDI, PABLO; RUEDA, DAVID. Social Democracy Constrained: Indirect Taxation in Industrialized Democracies. **British Journal of Political Science**, Cambridge University Press, v. 37, n. 4, p. 619–641, 2007. DOI: 10.1017/S0007123407000348.

BIRD, Richard M.; ZOLT, Eric M. Fiscal Contracting in Latin America. **World Development**, v. 67, p. 323–335, 2015. ISSN 0305-750X. DOI: https://doi.org/10.1016/j.worlddev.2014.10.011. Available from: <https://www.sciencedirect.com/science/article/pii/S0305750X14003222>.

BOIX, Carles; MILLER, Michael K.; ROSATO, Sebastian. **Boix-Miller-Rosato Dichotomous Coding of Democracy, 1800-2010**. [S.l.]: Harvard Dataverse, 2014. DOI: 10.7910/DVN/28468. Available from: <https://doi.org/10.7910/DVN/28468>.

BORGE, Lars-Erik; RATTSØ, Jørn. Income distribution and tax structure: Empirical test of the Meltzer–Richard hypothesis. **European Economic Review**, v. 48, n. 4, p. 805–826, 2004. ISSN 0014-2921. DOI: https://doi.org/10.1016/j.euroecorev.2003.09.003. Available from: <https://www.sciencedirect.com/science/article/pii/S0014292103001120>.

CAPLAN, Bryan. **The Myth of the Rational Voter: Why Democracies Choose Bad Policies - New Edition**. REV - Revised. [S.l.]: Princeton University Press, 2007. Available from: <http://www.jstor.org/stable/j.ctvcm4gf2>.

CUSACK, THOMAS R.; BERAMENDI, PABLO. **Taxing work**. [S.l.: s.n.], 2006. v. 45, p. 43–73. DOI: https://doi.org/10.1111/j.1475-6765.2005.00290.x. eprint: https://ejpr.onlinelibrary.wiley.com/doi/pdf/10.1111/j.1475-6765.2005.00290.x. Available from: <https://ejpr.onlinelibrary.wiley.com/doi/abs/10.1111/j.1475-6765.2005.00290.x>.

DE BOEF, Suzanna; KEELE, Luke. Taking Time Seriously. **American Journal of Political Science**, [Midwest Political Science Association, Wiley], v. 52, n. 1, p. 184–200, 2008. ISSN 00925853, 15405907. Available from: <http://www.jstor.org/stable/25193805>.

EBERHARDT, Markus. Democracy, Growth, Heterogeneity, and Robustness. **Working Paper**, 2021.

_____. MULTIPURT: Stata module to run 1st and 2nd generation panel unit root tests for multiple variables and lags, Feb. 2011. Available from: <https://ideas.repec.org/c/boc/bocode/s457239.html>.

EINHORN, Robin I. Liberty, Democracy, and Capacity: Lessons from the Early American Tax Regimes. In: PRASAD, Monica; MARTIN, Isaac; MEHROTRA, Ajay (Eds.). **The new fiscal sociology: Taxation in Comparative and Historical Perspective**. [S.l.: s.n.], 2009. P. 155–72.

FAIRFIELD, Tasha. Structural power in comparative political economy: perspectives from policy formulation in Latin America. **Business and Politics**, Cambridge University Press, v. 17, n. 3, p. 411–441, 2015. DOI: 10.1515/bap-2014-0047.

FAIRFIELD, Tasha; GARAY, Candelaria. Redistribution Under the Right in Latin America: Electoral Competition and Organized Actors in Policymaking. **Comparative Political Studies**, v. 50, n. 14, p. 1871–1906, 2017. DOI: 10.1177/0010414017695331. Available from: <https://doi.org/10.1177/0010414017695331>.

FERREIRA DE SOUZA, Pedro H. G. **Uma História de Desigualdade: A concentração de renda entre os ricos no Brasil 1926-2013**. [S.l.: s.n.], 2017.

FREEDOM HOUSE, Freedom in the World. Freedom in the Worlds Indicators, 2020.

GILENS, Martin. **Affluence and Influence Economic Inequality and Political Power in America**. [S.l.]: New York Princeton University Press, 2012.

GOULD, Andrew C.; BAKER, Peter J. DEMOCRACY AND TAXATION. **Annual Review of Political Science**, v. 5, n. 1, p. 87–110, 2002. DOI: 10.1146/annurev.polisci.5.100201.101909. Available from: <https://doi.org/10.1146/annurev.polisci.5.100201.101909>.

HACKER, Jacob S.; PIERSON, Paul. Winner-Take-All Politics: Public Policy, Political Organization, and the Precipitous Rise of Top Incomes in the United States. **Politics & Society**, v. 38, n. 2, p. 152–204, 2010. DOI: 10.1177/0032329210365042. Available from: <https://doi.org/10.1177/0032329210365042>.

HALLERBERG, MARK; BASINGER, SCOTT. Internationalization and Changes in Tax Policy in OECD Countries: The Importance of Domestic Veto Players. **Comparative Political Studies**, v. 31, n. 3, p. 321–352, 1998. DOI: 10.1177/0010414098031003003. Available from: <https://doi.org/10.1177/0010414098031003003>.

HUBER, Evelyne. **Democracy and the Left: Social Policy and Inequality in Latin America**. [S.l.: s.n.], Jan. 2012. P. 342. ISBN 9780226356525. DOI: 10.7208/chicago/9780226356556.001.0001.

IM, Kyung So; PESARAN, M.Hashem; SHIN, Yongcheol. Testing for unit roots in heterogeneous panels. **Journal of Econometrics**, v. 115, n. 1, p. 53–74, 2003. ISSN 0304-4076. DOI: https://doi.org/10.1016/S0304-4076(03)00092-7. Available from: <https://www.sciencedirect.com/science/article/pii/S0304407603000927>.

MADDALA, G. S.; WU, Shaowen. A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test. **Oxford Bulletin of Economics and Statistics**, v. 61, S1, p. 631–652, 1999. DOI: https://doi.org/10.1111/1468-0084.0610s1631. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/1468-0084.0610s1631>.

MARTINEZ-VAZQUEZ, Jorge; VULOVIC, Violeta; LIU, Yongzheng. Direct versus Indirect Taxation: Trends, Theory and Economic Significance. **International Studies Program, Andrew Young School of Policy Studies, Georgia State University, International Studies Program Working Paper Series, at AYSPS, GSU**, Jan. 2009.

MEDEIROS, Marcelo; CASTRO, Fábio Ávila de. A composição da renda no topo da distribuição: evolução no Brasil entre 2006 e 2012, a partir de informações do Imposto de Renda. **Economia e Sociedade**, v. 27, n. 2, p. 577–605, out. 2019. Available from: <https://periodicos.sbu.unicamp.br/ojs/index.php/ecos/article/view/8657048>.

MELTZER, Allan H.; RICHARD, Scott F. A Rational Theory of the Size of Government. **Journal of Political Economy**, University of Chicago Press, v. 89, n. 5, p. 914–927, 1981. ISSN 00223808, 1537534X. Available from: <http://www.jstor.org/stable/1830813>.

MORGAN, Kimberly J.; PRASAD, Monica. The Origins of Tax Systems: A French-American Comparison. **American Journal of Sociology**, The University of Chicago Press, v. 114, n. 5, p. 1350–1394, 2009. ISSN 00029602, 15375390. Available from: <http://www.jstor.org/stable/10.1086/595948>.

MORGAN, Marc. Income inequality, growth and elite taxation in Brazil: new evidence combining survey and fiscal data, 2001-2015. n. 165, Feb. 2018. Available from: <https://ideas.repec.org/p/ipc/wpaper/165.html>.

PAPAIOANNOU, Elias; SIOUROUNIS, Gregorios. Democratisation and Growth. **The Economic Journal**, v. 118, n. 532, p. 1520–1551, 2008. DOI: https://doi.org/10.1111/j.1468-0297.2008.02189.x. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-0297.2008.02189.x>.

PIKETTY, Thomas; GOLDHAMMER, Arthur. **Capital in the Twenty-First Century**. [S.l.]: Harvard University Press, 2014. ISBN 9780674430006. Available from: <http://www.jstor.org/stable/j.ctt6wpqbc>.

PIKETTY, Thomas; SAEZ, Emmanuel. How Progressive Is the U.S. Federal Tax System? A Historical and International Perspective. **Journal of Economic Perspectives**, v. 21, p. 3–24, Feb. 2007. DOI: 10.1257/jep.21.1.3.

PRASAD, Monica; DENG, Yingying. Taxation and the worlds of welfare. **Socio-Economic Review**, v. 7, n. 3, p. 431–457, Apr. 2009. ISSN 1475-1461. DOI: 10.1093/ser/mwp005. Available from: <https://doi.org/10.1093/ser/mwp005>.

ROBERTS, Kenneth. The Politics of Inequality and Redistribution in Latin America.s Post-Adjustment Era, Jan. 2012. DOI: 10.1093/acprof:oso/9780198701804.003.0003.

RODRIK, Dani. Democracies Pay Higher Wages. **The Quarterly Journal of Economics**, Oxford University Press, v. 114, n. 3, p. 707–738, 1999. ISSN 00335533, 15314650. Available from: <http://www.jstor.org/stable/2586882>.

RUEDA, DAVID. Insider–Outsider Politics in Industrialized Democracies: The Challenge to Social Democratic Parties. **American Political Science Review**, Cambridge University Press, v. 99, n. 1, p. 61–74, 2005. DOI: 10.1017/S000305540505149X.

SCHEIDEL, Walter. **The Great Leveler: Violence and the History of Inequality from the Stone Age to the Twenty-First Century**. [S.l.]: Princeton University Press, 2017. Available from: <http://www.jstor.org/stable/j.ctv346rs7>.

WEBBER, Carolyn; WILDAWSKY, Aaron. A History of Taxation and Expenditure in the Western World. **Journal of Peace Research**, v. 24, n. 2, p. 207–210, 1987. DOI: 10.1177/002234338702400215. Available from: <https://doi.org/10.1177/002234338702400215>.

WILLIAMS, Laron K.; WHITTEN, Guy D. But Wait, There's More! Maximizing Substantive Inferences from TSCS Models. **The Journal of Politics**, v. 74, n. 3, p. 685–693, 2012. DOI: 10.1017/S0022381612000473.

WORLD BANK, World Development Indicators. **Tax revenue and political institutions data sets**. [S.l.: s.n.], 2020.

Appendix

APPENDIX A – Supplementary Tables

Table 4 – Average Percentage of Income Taxes on Revenue by Political Regime (For Countries With Transitions)

Country	Democratic	Authoritarian	Difference
Brazil	16.01	25.14	-9.12
Chile	24.76	14.03	10.72
Croacia	7.90	11.05	-3.14
Cyprus	22.80	16.73	6.06
Dominican Rep.	20.00	19.27	0.73
Germany	15.97	18.66	-2.69
Hungary	18.35	16.48	1.86
India	29.25	20.68	8.56
Lesotho	18.40	17.68	0.72
Mexico	29.02	32.84	-3.81
Peru	24.62	16.88	7.74
Philippines	38.03	37.23	0.79
Romania	19.71	19.08	0.63
South Africa	50.44	53.68	-3.23
South Korea	28.70	24.67	4.03
Thailand	25.87	26.21	-0.33
Turkey	43.88	31.79	12.09
Uruguay	12.68	7.564	5.11
Average	24.80	22.76	2.04

Source: (BOIX; MILLER; ROSATO, 2014) (FREEDOM HOUSE, 2020) (WORLD BANK, 2020)

Table 5 – Average Percentage of Consumption Taxes on Revenue by Political Regime (For Countries With Transitions)

Country	Democratic	Authoritarian	Difference
Chile	45.13	37.73	7.40
Croatia	45.98	39.95	6.03
Cyprus	28.59	21.78	6.80
Dominican Rep.	36.32	33.58	2.73
Germany	22.74	23.54	-0.79
Hungary	33.65	35.65	-2.00
India	32.67	33.20	-0.53
Lesotho	28.10	26.53	1.56
Mexico	41.10	45.90	-4.79
Peru	41.63	43.29	-1.65
Philippines	26.93	25.44	1.49
Romania	35.05	25.10	9.95
South Africa	33.88	28.68	5.19
South Korea	29.64	44.76	-15.12
Thailand	43.40	43.45	-0.05
Turkey	27.37	34.35	-6.98
Uruguay	39.59	40.49	-0.90
Average	34.81	34.32	0.48

Source: (BOIX; MILLER; ROSATO, 2014) (FREEDOM HOUSE, 2020) (WORLD BANK, 2020)

Table 6 – Unit Root Tests

Especification	Income Taxes	Consumption Taxes	Ratio
0 lags	I(0)	I(0)	I(0)
(p-value)	0.000	0.000	0.000
1 lag	I(0)	I(0)	I(0)
(p-value)	0.000	0.001	0.000
2 lags	I(0)	I(0)	I(0)
(p-value)	0.000	0.026	0.017
0 lags (trend)	I(0)	I(0)	I(0)
(p-value)	0.000	0.000	0.000
1 leg (trend)	I(0)	I(0)	I(0)
(p-value)	0.000	0.000	0.000
2 lags (trend)	I(0)	I(0)	I(1)
(p-value)	0.000	0.009	0.096

Table 7 – Consumption Tax Models

VARIABLES	(1) Pooled	(2) FE(country)	(3) Cluster(country)	(4) FE(Region)	(5) High Income
dem_years	0.116***	0.118***	0.116**	0.0763	0.127***
	(0.0287)	(0.0291)	(0.0516)	(0.0557)	(0.0357)
l_demyears	-0.120***	-0.140***	-0.120**	-0.0791	-0.130***
	(0.0289)	(0.0296)	(0.0524)	(0.0572)	(0.0359)
GDPpcGrowth	-7.82e-05	-4.28e-05	-7.82e-05	-9.20e-05**	-6.55e-05
	(6.40e-05)	(6.74e-05)	(7.63e-05)	(4.17e-05)	(6.52e-05)
l_GDP	-0.000130**	-9.94e-05	-0.000130***	-0.000128***	-0.000119*
	(6.52e-05)	(6.81e-05)	(4.89e-05)	(3.76e-05)	(6.63e-05)
inflation_cprice	0.000667	0.000581	0.000667	0.000785	0.000741
	(0.00120)	(0.00120)	(0.000843)	(0.000918)	(0.00122)
l_inflation	-0.000129	6.83e-05	-0.000129	-0.000183	-0.000284
	(0.00131)	(0.00132)	(0.00102)	(0.00108)	(0.00133)
High_Income					-0.172
					(0.163)
Constant	1.578***	5.023***	1.578***	1.456***	1.628***
	(0.231)	(0.524)	(0.319)	(0.305)	(0.235)
Observations	1,633	1,633	1,633	1,534	1,633
2 Lags of DV	Yes	Yes	Yes	Yes	Yes
Time trend	Yes	Yes	Yes	Yes	Yes
Number of countries	69	69	69	69	69

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

*Democratic transitions were not significant, neither significantly affected the coefficients of other variables, thus I removed it from this visualization for clarity

Table 8 – Income Tax Models

VARIABLES	(1) Pooled	(2) FE(country)	(3) Cluster(country)	(4) FE(Region)	(5) High Income
dem_years	0.0255	0.0423*	0.0255	0.0294	0.0743**
	(0.0254)	(0.0253)	(0.0448)	(0.0252)	(0.0331)
l_demyears	-0.0254	-0.0372	-0.0254	-0.0298	-0.0719**
	(0.0255)	(0.0256)	(0.0451)	(0.0257)	(0.0333)
GDPpcGrowth	0.000184***	0.000260***	0.000184**	0.000192*	0.000229***
	(5.16e-05)	(5.33e-05)	(8.81e-05)	(0.000107)	(5.22e-05)
l_GDP	1.38e-06	0.000124**	1.38e-06	-2.01e-06	4.76e-05
	(5.26e-05)	(5.42e-05)	(4.97e-05)	(4.46e-05)	(5.32e-05)
inflation_cprice	0.00367***	0.00310***	0.00367**	0.00358	0.00338***
	(0.000970)	(0.000951)	(0.00175)	(0.00258)	(0.000977)
l_inflation	-0.00472***	-0.00335***	-0.00472***	-0.00465***	-0.00450***
	(0.00106)	(0.00105)	(0.00124)	(0.00163)	(0.00107)
High_Income					-0.622***
					(0.132)
Constant	0.517***	3.725***	0.517***	0.581*	0.827***
	(0.131)	(0.456)	(0.140)	(0.316)	(0.148)
Observations	1,641	1,641	1,641	1,540	1,641
2 Lags of DV	Yes	Yes	Yes	Yes	Yes
Time trend	Yes	Yes	Yes	Yes	Yes
Number of country	69	69	69	69	69

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

*Democratic transitions were not significant, neither significantly affected the coefficients of other variables, thus I removed it from this visualization for clarity

Table 9 – Income/Consumption Ratio Models

VARIABLES	(1) Pooled	(2) FE(country)	(3) Cluster(country)	(4) FE(Region)	(5) High Income
dem_years	0.000545	0.00304	0.000545	-5.90e-05	0.00157
	(0.00496)	(0.00475)	(0.00178)	(0.00146)	(0.00500)
l_demyears	-0.000385	-0.00248	-0.000385	0.000233	-0.00128
	(0.00500)	(0.00485)	(0.00187)	(0.00146)	(0.00503)
democracy_trans	-0.0590	-0.0866	-0.0590*	-0.0453	-0.0661
	(0.0854)	(0.0806)	(0.0331)	(0.0429)	(0.0855)
GDPpcGrowth	1.64e-05**	1.74e-05**	1.64e-05	1.70e-05	1.88e-05**
	(7.81e-06)	(7.77e-06)	(1.09e-05)	(1.22e-05)	(7.94e-06)
l_GDP	4.07e-06	9.91e-06	4.07e-06	3.62e-06	6.38e-06
	(7.97e-06)	(7.87e-06)	(4.28e-06)	(6.01e-06)	(8.09e-06)
inflation_cprice	8.38e-05	4.06e-05	8.38e-05**	8.03e-05*	7.47e-05
	(0.000147)	(0.000138)	(4.23e-05)	(4.49e-05)	(0.000147)
l_inflation	-0.000150	-5.90e-05	-0.000150**	-0.000144***	-0.000137
	(0.000159)	(0.000151)	(6.54e-05)	(2.06e-05)	(0.000159)
High_Income					-0.0327
					(0.0202)
Constant	-0.0137	0.328***	-0.0137	-0.0137	-0.00383
	(0.0124)	(0.0504)	(0.0122)	(0.0138)	(0.0138)
Observations	1,606	1,606	1,606	1,533	1,606
2 Lags of DV	Yes	Yes	Yes	Yes	Yes
Time trend	Yes	Yes	Yes	Yes	Yes
Number of country	68	68	68	68	68

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10 – Consumption Tax Models (No complementary FH data)

VARIABLES	(1) Pooled	(2) FE(country)	(3) Cluster(country)	(4) FE(Region)	(5) High Income
dem_years	0.111***	0.108***	0.111	0.0313	0.114***
	(0.0362)	(0.0368)	(0.0733)	(0.0354)	(0.0439)
l_demyears	-0.114***	-0.109***	-0.114	-0.0332	-0.116***
	(0.0364)	(0.0373)	(0.0737)	(0.0368)	(0.0441)
GDPpcGrowth	-9.61e-05	-7.67e-05	-9.61e-05	-0.000112	-9.84e-05
	(7.69e-05)	(8.07e-05)	(0.000105)	(7.38e-05)	(7.85e-05)
l_GDP	-0.000182**	-0.000161**	-0.000182***	-0.000166***	-0.000185**
	(7.78e-05)	(8.19e-05)	(6.97e-05)	(3.91e-05)	(7.95e-05)
inflation_cprice	0.000779	0.000612	0.000779	0.000881	0.000912
	(0.00121)	(0.00120)	(0.000831)	(0.000892)	(0.00122)
l_inflation	-0.000177	-0.000287	-0.000177	-0.000277	-0.000395
	(0.00132)	(0.00132)	(0.000996)	(0.00104)	(0.00134)
High_Income					0.0206
					(0.179)
Constant	1.585***	5.189***	1.585***	1.525***	1.585***
	(0.245)	(0.598)	(0.330)	(0.407)	(0.250)
Observations	1,379	1,379	1,379	1,301	1,379
2 Lags of DV	Yes	Yes	Yes	Yes	Yes
Time trend	Yes	Yes	Yes	Yes	Yes
Number of country	69	69	69	69	69

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 11 – Income Tax Models (No complementary FH data)

VARIABLES	(1) Pooled	(2) FE(country)	(3) Cluster(country)	(4) FE(Region)	(5) High Income
dem_years	-0.0478	-0.0156	-0.0478*	-0.0450	-0.00673
	(0.0345)	(0.0348)	(0.0285)	(0.0357)	(0.0454)
l_demyears	0.0485	0.0248	0.0485*	0.0454	0.00987
	(0.0347)	(0.0350)	(0.0287)	(0.0353)	(0.0456)
GDPpcGrowth	0.000215***	0.000314***	0.000215*	0.000223	0.000269***
	(6.31e-05)	(6.52e-05)	(0.000116)	(0.000143)	(6.40e-05)
l_GDP	-1.11e-05	0.000151**	-1.11e-05	-1.96e-05	4.90e-05
	(6.39e-05)	(6.66e-05)	(7.19e-05)	(6.90e-05)	(6.51e-05)
inflation_cprice	0.00367***	0.00312***	0.00367**	0.00357	0.00341***
	(0.000991)	(0.000974)	(0.00170)	(0.00254)	(0.000999)
l_inflation	-0.00473***	-0.00326***	-0.00473***	-0.00466***	-0.00444***
	(0.00109)	(0.00108)	(0.00123)	(0.00166)	(0.00110)
High_Income					-0.647***
					(0.147)
Constant	0.549***	3.761***	0.549***	0.605**	0.863***
	(0.145)	(0.537)	(0.146)	(0.294)	(0.162)
Observations	1,387	1,387	1,387	1,307	1,387
2 Lags of DV	Yes	Yes	Yes	Yes	Yes
Time trend	Yes	Yes	Yes	Yes	Yes
Number of country	69	69	69	69	69

Standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 12 – Income/Consumption Ratio Models (No complementary FH data)

VARIABLES	(1) Pooled	(2) FE(country)	(3) Cluster(country)	(4) FE(Region)	(5) High Income
dem_years	-0.00153	0.00263	-0.00153	-0.00260	0.000479
	(0.00668)	(0.00651)	(0.00281)	(0.00191)	(0.00675)
l_demyears	0.00164	-0.00192	0.00164	0.00273	-0.000189
	(0.00674)	(0.00662)	(0.00289)	(0.00201)	(0.00679)
democracy_trans	-0.0493	-0.0841	-0.0493	-0.0319	-0.0612
	(0.0899)	(0.0855)	(0.0384)	(0.0475)	(0.0900)
GDPpcGrowth	2.57e-05***	2.64e-05***	2.57e-05	2.68e-05	2.93e-05***
	(9.42e-06)	(9.40e-06)	(2.00e-05)	(2.47e-05)	(9.59e-06)
l_GDP	5.55e-06	1.42e-05	5.55e-06	4.98e-06	9.39e-06
	(9.56e-06)	(9.57e-06)	(6.14e-06)	(7.94e-06)	(9.74e-06)
inflation_cprice	8.35e-05	4.93e-05	8.35e-05*	8.05e-05*	7.11e-05
	(0.000148)	(0.000140)	(4.41e-05)	(4.88e-05)	(0.000148)
l_inflation	-0.000145	-5.44e-05	-0.000145**	-0.000139***	-0.000127
	(0.000161)	(0.000153)	(6.44e-05)	(2.91e-05)	(0.000161)
High_Income					-0.0441**
					(0.0223)
Constant	-0.0208	0.309***	-0.0208	-0.0207	-0.00779
	(0.0138)	(0.0626)	(0.0174)	(0.0201)	(0.0153)
Observations	1,358	1,358	1,358	1,301	1,358
2 Lags of DV	Yes	Yes	Yes	Yes	Yes
Time trend	Yes	Yes	Yes	Yes	Yes
Number of country	68	68	68	68	68

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1