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Taxation of Families and "Families of Taxation"? Inequality Modification Between Family Types Across Welfare States

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Inequality modification between family types across welfare states

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Abstract

Previous sociological research has overlooked the fact that a welfare state's tax system does not solely redistribute from rich to poor (vertical) but also between family types (horizontal). Different types of families are treated differently due to (de-)familialization policies in the tax code, such as joint filing for spouses or single-parent relief. In this study I aim to examine the tax system's modification of horizontal income inequality between the six most prevalent family types of non-retiree households. To answer my research aim I draw on harmonized data from 30 countries provided by the Luxembourg Income Study (LIS). I estimate pre- and post-fiscal income inequality measured as between-family-type Theil indices. Using linear regression, I examine the association of the percentage change in inequality and the prevalence of family type-related tax characteristics. I apply hierarchical cluster analysis to evaluate the congruence of welfare state classification and family tax policy. The results show that welfare states with familialization tax policies reduce less horizontal income inequality compared to welfare states without familialization tax policies. Nevertheless, the prevalence and outcomes of familialization policies in the tax code do not correspond to welfare state classifications.

Keywords: family, inequality, redistribution, social policy, taxation, welfare state

JEL classification: H23 Externalities; Redistributive Effects; Environmental Taxes and Subsidies, H24 Personal Income and Other Nonbusiness Taxes and Subsidies, I38 Government Policy; Provision and Effects of Welfare Programs

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1. Introduction

In the light of the ongoing scientific discussion on rising inequality, many scholars have called for the welfare state to intervene. However, welfare states differ in many aspects. Among the most influential topics in the literature is the welfare state's effort to redistribute from rich to poor in order to reduce poverty and inequality. Welfare states undertake redistribution through transfers and taxes (Prasad and Deng 2009). Nevertheless, welfare states do not solely redistribute from rich to poor (vertical) (Bergh 2005) but also between groups, such as gender, race or different family types (horizontal) (Stewart 2008). Different types of families (defined by marital status and the presence of children) may be treated differently because tax systems provide family type-dependent benefits, including child allowances, marriage premiums or preferential tax schedules. For instance, whereas a single parent may enjoy a different tax bracket from an unmarried couple, married spouses may benefit from joint taxation.

In general, the traditional married family pattern is commonly associated with positional advantages when compared to other family formations (Maldonado and Nieuwenhuis 2015). Married couples tend to have higher disposable household incomes and low poverty rates, while single-parent families are associated with a higher risk of being poor (McLanahan and Percheski 2008). If marriage is for instance associated with substantial institutionalized economic advantages, such as favourable tax brackets, single parents are systematically excluded from those benefits and gains. Hence, the horizontal redistribution system may hint at implicit political and social norms towards certain family formations (McCaffery 1999). It is therefore crucial to learn more about the welfare state's mitigation of horizontal inequality. In other words, the institutionalized structuring of horizontal income inequality between family types matters because social risks are not distributed equally across family types.

These policies of horizontal redistribution, however, may encourage *de-familialization* by enhancing individual autonomy (e.g. single-parent allowance) or promote *familialization* through strengthening individual dependency on the family (e.g. joint taxation). In addition, these policies vary greatly across countries (Bussolo et al. 2019). Nevertheless, previous research has neglected the significance of tax policy as a means of social policy (Ruane et al. 2020). Therefore, the present study aims to understand *how income taxation modifies horizontal income inequality between family types in a cross-national comparative perspective*.

To answer my research aim, I examine income inequality between the six most prevalent family types (married without children, married with children, unmarried without children, unmarried with children, single parent, single) of non-retiree households before and after income taxation

across welfare states. To this end, I draw on harmonized income, transfer and taxation data from 30 countries in the Luxembourg Income Study (LIS) and estimate between-family-type Theil indices as measures of inequality at each income stage. In order to assess how welfare states' tax policies structure income inequality between family types, I empirically identify family-related tax policies and evaluate their impacts using linear regression. I apply hierarchical cluster analysis to evaluate whether the taxation of families results in 'families of taxation' country clusters.

In the present study I build on the concept of 'horizontal inequality' from public and development economics and apply it to fiscal sociology. Broadly, horizontal inequality can be understood as any social, political or economic dimension of inequality between defined groups and thus it allows for adaptation to any structural dimension (Gachet et al. 2019). Hence, horizontal inequality generally refers to inequality between countries, regions or ethnicities (Stewart 2008). In terms of tax analysis, most economic research has framed inequality between groups as 'horizontal inequity'[i] (Gravelle and Gravelle 2006). Whereas the *inequity perspective* predominantly focuses on comparing tax burdens for different household types and questions whether treating different household types in different ways is *fair*, the approach of *horizontal inequality* emphasizes inequality as an *outcome* (Canelas and Gisselquist 2018), which is structured by treating different household types differently.

Previous research studying income redistribution across welfare states has tended to neglect horizontal inequality and inequity, rendering it the 'orphan child of tax policy' (Gravelle and Gravelle 2006). On the one hand, the comparative redistribution literature examines tax systems across welfare states in general (Prasad and Deng 2009) and studies their inter-individual distributional effort (Kammer et al. 2012), or its development over time (Caminada et al. 2019). On the other hand, the body of literature interested in horizontal family-type redistribution usually singles out poverty (Brady, Finnigan and Hübgen 2017) and hence only looks at a very specific aspect of inequality. Few studies directly compare between-family-type inequality, typically through referring to hypothetical households using a microsimulation model (Immervoll 2011). However, reporting the median tax burdens of hypothetical households says little about horizontal inequality within or across countries. In response, the present study aims to bridge the gap between the extensive comparative literature on the effect of taxation on vertical inter-individual inequality and the limited research on between-family-type redistribution.

This study contributes to our understanding of familialization tax policy in general and the welfare state's modification of horizontal income inequality in particular. Assessing the role of taxation as an institutional set-up that assigns additional benefits to certain family patterns is of considerable societal interest. Indeed, if being a member of a certain family type is associated with salient disadvantages, both economic and social well-being are affected. Therefore, I argue that because family patterns have become increasingly diverse in recent decades, inequality between family types has become a significant dimension of horizontal inequality. If different family types are treated differently due to their family status, then redistribution is not just about the individual's success in the labour market, but his or her embeddedness in family formations as well.

2. Background

The ability of the public transfer system to reduce social risks, decrease poverty and mitigate income inequality has received significant attention from sociologists. By contrast, until recently taxation, the most relevant source of welfare state revenue, remained largely neglected in comparative social policy research (Martin and Prasad 2014; Ruane et al. 2020). Nevertheless, taxation is an undeniable instrument of stratification and redistribution (Sainsbury 1999). Be it the degree of tax progressivity or tax-free income brackets or deductions for children, the way in which the welfare state collects revenue clearly influences redistribution (Sinfield 2013, p. 21). Comparative welfare state research interested in mitigating horizontal inequality between family types should therefore consider the tax system. In the following, I will briefly discuss previous research regarding family types in general (2.1) before addressing the specific literature on vertical (2.2) and horizontal inequality and redistribution (2.3).

2.1 Family types and taxation

The overall effects of taxes on horizontal income inequality between family types may differ from those on vertical income inequality for two reasons. The first is related to patterns of dispersion of household-type income: the incomes of different family types are not equally distributed across the overall income strata, as single-parent households (for instance) usually cluster around low-income levels. The second owes to the specific design of a welfare state's tax and transfer system, because married couples (for instance) may be treated differently from non-married couples. In particular, the formerly hegemonic married family household type may

enjoy distributional benefits in some welfare states because of the rigidness of tax systems that still promote traditional male breadwinner family arrangements (McCaffery 1999, p. 1).

However, between-family-type income inequality has come into view only due to the increasing diversification of family formations in recent decades. As long as the traditional married family pattern of the post-war era was the default social norm, diverging living arrangements seemed insignificant. Unsurprisingly, it has been scholars in the gender studies tradition who have drawn attention towards horizontal family-type redistribution in order to understand implicit gender inequalities in social policy (Sainsbury 1999, 2008). In particular, the ongoing debate about the 'marriage bonus' or 'single penalty' in the United States (US) tax system constitutes the majority of the literature (Alm and Leguizamon 2015). By contrast, beyond one study comparing France and Germany (Wrohlich et al. 2005), empirical evidence comparing horizontal family-type redistribution across countries remains absent.

2.2 Vertical inequality and redistribution

Addressing the welfare state's contribution to inter-individual inequality by examining redistribution from high to low income is the most common approach in the literature. A large body of research studies the effects of taxes and transfers on individual income in a comparative setting (Mahler and Jesuit 2006; Jesuit and Mahler 2010; Immervoll 2011; Wang et al. 2012, 2014). The general procedure is to capture 'redistribution' by calculating the difference between disposable income after taxes and transfers and market income before any public redistribution intervention. Although it has been noted that market income is itself shaped by the welfare state (Bergh 2005; Brady, Blome and Kleider 2017), for instance through minimum wage regulations, this 'from-gross-to-net'-approach is still the most common way to address redistribution (Guillaud et al. 2019). When it comes to welfare state typologization, previous research has indicated that systematic differences between welfare state types hold up to vertical redistribution patterns, with Scandinavian welfare states generally redistributing more than their Anglo-liberal welfare counterparts (Kammer et al. 2012). However, the tax system seems to be less progressive in more generous welfare states (Prasad and Deng 2009) and hence regressive taxation reduces the redistributive effect of generous transfers.

Partly due to the lack of reliable and comparable microdata, until recently scholars relied on macro-indicators when classifying welfare states. Starting with Sven Steinmo (1993), social scientists argued that liberal welfare states have more progressive tax systems because the development of a large welfare state depends on having a regressive revenue system (Kato 2003) or because regressive taxation makes distributional welfare policies more tolerated in the

upper-income strata (Wilensky 2002). Most notably, Monica Prasad and Yingying Deng (2009) examined whether welfare state indices (such as Esping-Andersen's decommodification index) and tax systems are congruent across welfare state types. With the exception of the United Kingdom (UK), their findings support the earlier claims that liberal welfare states have more progressive tax systems than their conservative or social-democratic welfare counterparts.

Due to the greater availability of comparative data at the micro level with the expansion of the LIS database, comparative research on inequality due to taxes and transfers has recently become far more feasible. Hence, a growing body of literature investigates the distributional consequences of taxes and transfers in a comparative setting, emphasizing e.g. inequality over time (Wang et al. 2014), disentangling taxes and social benefits (Wang et al. 2012), or stressing the relevance of different levers of the public distributional system (Guillaud et al. 2019).

2.3 Horizontal inequality and redistribution

Vertical inequality is the predominant focus of the 'classical' comparative literature on redistribution. However, across the range of social policy and redistributive instruments, be they social transfers or taxation, the individual is generally not addressed as a single data point in the income strata. First, individuals are treated as situated and embedded in their living context, i.e. the household in which they live. Hence, almost all welfare states provide some kind of special transfers for children, tax exemptions for families or bonuses for married couples and so on. This is implicitly reflected in the literature on vertical inequality, but not systematically examined. Social science research on the vertical redistributive patterns of welfare states therefore misses a crucial dimension of redistribution: the redistribution of income between different types of families across strata. It is clear that tax systems do not treat everyone equally (given progressive taxation), but they may not even treat equal earners equally if one household receives tax relief and another does not.

The limited body of research examining between-family-type income inequality in most cases remains on a national case study basis (see e.g., Wrohlich et al. 2005). These studies usually emphasize the crucial significance of redistribution between types of families and lament the lack of attention given to the topic in the literature (Gravelle and Gravelle 2006; Bussolo et al. 2019). Comparative studies tend to be based on microsimulation models with hypothetical median households (Immervoll 2011) reporting only median values or average tax rates (Pechman and Engelhardt 1990) and thus tell us little about the actual distribution.

A second strand of the between-family-type income inequality literature singles out poverty and its mediation. This sociological tradition looks at the reduction of the risk of poverty by the tax and transfer system and differences between family types (Rothwell and McEwen 2017). In particular, some studies emphasize the significance of child poverty policies for differences in poverty rates between types of families (Gornick and Smeeding 2018). David W. Rothwell and Annie McEwen (2017) focus on changes in child poverty risk by family types across liberal welfare states during the 2008 recession. By decomposing changes in child poverty over time, they illustrate the crucial impact of transfer and tax policies.

It is worth noting, however, that horizontal family type redistribution analysis is not an alternative to vertical redistribution analysis, but merely offers a different perspective on inequality. If different family types are treated differently, then redistribution is not just about the individual's success in the labour market, but also his or her embeddedness in family formations. In the following I will therefore briefly elaborate on the main family-related tax characteristics.

3. Tax mechanisms

In this section I briefly describe the main concepts that underlie taxation-based income inequality between family types. An examination of overall tax indicators such as tax revenue or tax progressivity, as can be found in the existing literature, may prove a poor indicator when it comes to between-family-type inequality modifications. I therefore argue that specific family-related components of the income tax system are pivotal. This draws attention to the tax benefit mechanisms within the tax system that are designed to promote certain family formations, such as tax relief for single-breadwinner households. Such an idea of familialization in the tax code is by no means new (Sainsbury 1999). Notwithstanding, little empirical evidence has been gathered (Figari 2015).

In general, familialistic policies emphasize and enforce the caretaking responsibility of the family, whereas de-familialistic policies advocate the welfare state's responsibility to do so. However, both concepts should be understood as extremes on a continuum. Hence, the concept of familialization stresses the institutionally driven dependency of individuals on their family context, which is particularly interesting when scrutinizing income inequality between family types (Sainsbury 1999). For example, policies promoting familialization may be defined as

promoting a single-breadwinner model with a stay-at-home spouse (Leitner 2003; Rastrigina and Verashchagina 2015).

According to relationship status and the presence of children, the following six family types account for the vast majority of people in most countries: (1) married without children, (2) married with children, (3) unmarried without children, (4) unmarried with children, (5) single parent and (6) single.[ii] Nevertheless, how are patterns of tax policy associated with the modification of income inequality between these types of families? To scrutinize these structures, the specific design of a welfare state's tax system is pivotal. There are at least six different aspects within the income tax code that are highly relevant for income inequality modification between family types.

First, the overall *level (1)* of taxation indicates the distributional power: if there is no noteworthy income tax, redistribution may be insignificant. Second, the overall *progressivity (2)* of the tax structure may hint at its capacity to reduce market income inequality. Both tax level and tax progressivity are crucial for vertical and horizontal redistribution alike.

The specific notion of family type inequality, however, comes particularly into sight when scrutinizing the remaining four aspects. First, countries differ in the income *tax filing unit (3)*, which most commonly is the individual or the married couple. The joint filing of married couples assumes that income and consumption are shared within the household and, in effect, means that the marginal income tax rate is dependent on the spouse's earnings. Therefore, joint filing has been criticized as a strong familialization policy that leads to persistent gender inequalities (McCaffery 2009). Applying individual filing means that all individuals are treated separately regardless of their marital status when assessing the income tax. This is usually understood as a de-familialization policy design in the tax code, because it assumes the complete independence of individuals within households (Sainsbury 1999).

Second, *income splitting (4)* aggregates the spouse's income and calculates the tax burden on the combined income. Therefore, this is in fact a particularly strong version of joint filing. In most countries, married couples benefit from income splitting if they have unequal incomes (e.g. US and Germany). Therefore, strong incentives for the weak labour market attachment of secondary earners are commonly assumed (Alm and Melnik 2004; Rastrigina and Verashchagina 2015). The significant implications for gender inequality and individual autonomy have been widely discussed (McCaffery 1999).

Although most welfare states apply individual filing, this does not mean that the tax rates of spouses are independent from each other, nor does it mean that family-oriented mechanisms are absent in the tax code. Many countries with individual filing at least offer some kind of special *dependent spouse allowances (5)* for the breadwinner (Rastrigina and Verashchagina 2015). This mechanism reduces the taxable income of the main earner if his or her spouse has no or low income and hence promotes the dependencies of non-earner or stay-at-home spouses. Consequently, these tax characteristics are best described as familialization tax policies.

On the other hand, special *single-parent allowances (6)* reduce the tax burden for single parents. In contrast to the tax mechanisms mentioned above, such allowances are designed to secure a single parent's autonomy instead of binding it to the ex-spouse's alimony. Hence, it represents a de-familialization tax policy.

Taken together, the country-specific design of *joint filing*, the *specific case of income splitting* and the offer of *dependent spouse allowances* are implicit indicators of the degree of familialization in a welfare state's income tax system. Although in many countries there are additional characteristics that can be used to evaluate familialization in the tax code (e.g. the degree of transferability of basic allowances between spouses), the six aspects described above should be the key determinants.

These specific family-related aspects in the tax code should therefore influence inequality between types of families. In particular, married couples and couples with children are expected to benefit from familialization policies when compared to other family types. Usually these family types have higher equalized market household incomes than unmarried or single people or single parents. For example, the mean equalized household income for married couples without children in Germany is about $57,800 whereas unmarried couples on average earn $53,700, singles $39,400 and single parents only $23,400 (in purchasing power parity-adjusted 2011 US dollars, USD). It is worth noting, however, that family types in general also differ in terms of age structure, education level and migration status. Nevertheless, this pattern is quite similar across countries. Married couples earn more than unmarried ones regardless of whether they have children. Most couples in general earn more than singles, while single parents are commonly most economically disadvantaged. In general, high tax levels and substantial progressivity should significantly reduce income inequality between these family types. However, if family-related aspects in the tax code systematically benefit those family types that have a higher mean income (e.g. married couples) compared to those with a lower mean income

(e.g. single parents), then the reduction in income inequality between these family types may be lower than expected.

Additionally, cross-country differences regarding the tax modification of horizontal inequality may follow the traditional patterns of well-established comparative frameworks. It is therefore intuitive to search for welfare state clusters in a cross-country setting. Since Esping-Andersen's (1990) well-known typologization of welfare states, social policy researchers have challenged, adapted or expanded his 'three worlds of welfare' in numerous ways (Arts and Gelissen 2002). Besides 'conservative', 'social-democratic' and 'liberal' welfare state types, scholars have argued for separate 'Mediterranean' (Gal 2010), 'Eastern Europe' (Aidukaite 2009) or even 'Latin American' (Barrientos 2009) worlds of welfare. Previous research focusing on the role of taxation in any of these 'worlds of welfare' has almost exclusively examined the overall structure of the tax system, meaning tax revenue as a percentage of gross domestic product (GDP) or tax progressivity. These overall tax indicators have encouraged researchers to map taxation onto Esping-Andersen's 'worlds of welfare' or to cluster 'families of taxation' (Obinger and Wagschal 2001) in the style of Castle's (1993) 'families of nations' in order to ascertain whether tax indicators and welfare state typologies are congruent. Overall, these tax clusters replicate the social policy typologies. Whether the taxation of families leads to analogue 'families of taxation' is however unclear.

4. Hypotheses

The overall income tax rate and the progressivity of the tax scheme are key determinants of income inequality modifications regardless of any specifically family-related income tax benefits. Given that different family types are distributed differently across income strata, progressive income taxation at a significant rate will result in a decrease of between-family-type income inequality after taxation. Hence, I derive my first hypotheses:

H1a (tax structure): Greater progressivity is associated with a higher reduction in income inequality between family types.

H1b (tax level): The higher the effective tax rate, the greater the reduction in income inequality between family types.

However, considering that most countries apply a specific tax treatment for different family formations, progressivity and tax level are not the sole determinants of income inequality

modification. As mentioned above, several family-related benefits within the income tax schedule may change the picture dramatically. Family types with on average higher market incomes should in particular benefit from these family-related tax instruments. Therefore, these familialization tax policies may actually counteract the reduction of income inequality due to tax level and tax progressivity. Accordingly, I derive my second hypothesis:

H2 (tax benefits): Familialization policies in the tax code are associated with less reduction of between-family-type income inequality.

If the macro-level outcomes of the modification of between-family-type income inequality owe to the family-related tax benefits described above, then compared to other family types, the promoted family models (such as married couples) should face substantially lower tax burdens in countries with joint filing and income splitting for married couples. This should result in less reduction of inequality between married couples and all other family types. Therefore, I expect:

H3 (married couples): Joint filing and income splitting are associated with less reduction of income inequality between married couples and all other family types.

Nevertheless, this says little about systematic differences across welfare state types regarding the mitigation of horizontal income inequality between family types. Welfare state types differ systematically in their modification of vertical income inequality (Kammer et al. 2012). The social-democratic welfare state type is usually the most generous and redistributive type and hence has the lowest levels of income inequality after taxes and transfers. At the same time, social-democratic welfare states have lower levels of familialism and so greater income inequality reduction between family types could be expected. Following the strand of literature that has incorporated familialism and its counterpart – de-familialism – into the comparative welfare state framework, I argue that the tax characteristics and corresponding outcomes of between-family-type income inequality modifications across countries are congruent with existing welfare state typologies. Thus, finally, I expect:

H4 (clusters): Groups of countries clustered by the prevalence of family-related tax policies and their modification of between-family-type income inequality are congruent with welfare state typologies.

5. Data

To test my hypotheses, I draw on survey data from the LIS database. LIS is a cross-national collection of national microdata sets containing comprehensive data on income and their disaggregation into multiple sources, such as public transfers, taxes and labour income. The LIS data are particularly appropriate as they provide harmonized and hence comparable information on taxation at the household level. Given that it is not possible to distinguish income taxes from payroll taxes in most countries, both categories are analyzed together. For a consistent comparison, I use the last available data set for each country with gross income information, resulting in data from 30 countries. With the exception of the Belgium data, most of the data sets are from between 2013 and 2016.[iii]

As a considerable share of income deductions does not solely redistribute between individuals, but between the past, present and future of the same individual, the issue of how to deal with pension income emerges. I follow the most common approach and restrict my sample to households without any pension income. Due to substantial cross-country differences in the tax treatment of pension income, this is the most reliable approach when examining taxation.[iv]

This study scrutinizes income inequality between the six most prevalent family types. It is worth noting, however, that households that do not fit into this categorization (such as living with other relatives) are excluded from the analysis. In most countries these six family nuclei account for almost all households (e.g. most European countries), but in some places (e.g. many Latin American countries) a considerable share of households is excluded due to more complex family arrangements.[v] Therefore, income inequality between family types always refers to income inequality between these six common family nuclei.

Monetary information is adjusted to 2011 USD purchasing power parity. Furthermore, households are weighted using the LIS weights to improve the representability of countries. Ultimately, all income information is equalized according to the standard LIS procedure, which divides the household income by the square root of the number of household members.

6. Measurement

6.1 Dependent variable

To address my hypotheses, I use the percentage change in the between-group Theil index as my dependent variable in linear regression models. Following Huber and Stephens (2014, p. 252),

I measure redistribution as the percentage reduction in inequality, instead of measuring the absolute reduction. The measurement of change in inequality therefore equals:

$$\Delta \mathrm{I} = \frac{I_{pre} - I_{post}}{Ipre} * 100$$

Most literature on redistribution examines the percentage change in the Gini index. When it comes to inequality between groups, however, inequality measures such as the Theil index are superior because of their additive nature (Jenkins and van Kerm 2009). Most notably, the Theil index allows for perfect decomposition in within- and between-group components and hence perfectly fits the examination of inequality between family types. This means that the overall inequality measure equals the aggregation of the inequality measured between groups and the inequality measured within groups. The within-group component therefore indicates e.g. the unequal distribution of income between all single-parent households. The between-group component in this example, however, shows the unequal distribution of income, e.g. between all single-parent households and all married couples. Therefore, there is only one between-group inequality value per country. Technically, the between-group component of the Theil index measures the weighted log ratio of the different groups' population and income shares (Conceição and Ferreira 2000). Hence, the between-group Theil index can be expressed as follows:

$$\mathrm{T} = \sum w_g * \ln\left(\frac{w_g}{p_g}\right)$$

Where w_g corresponds to group g's share of total income and p_g indicates group g's population share. The between-group component equals zero if a group has equal income and population shares. Therefore, this between-group measure does not indicate anything about inequality within the group. However, different indices from the generalized entropy measures (GE) family have different levels of sensitivity to distinct parts of the distribution. Whereas the Theil index tends to be more sensitive to the upper part of the income strata, the mean log deviation (MLD) better captures inequality in the middle. For simplicity reasons I discuss the results from the Theil index in the main analysis and provide the MLD results in the appendix as a robustness check. I use Stata ado ineqdeco for the inequality decomposition (Jenkins 1999).

6.2 Independent variables

I calculate the *mean effective tax rate* per country from the LIS data. This overall level of income tax indicates the mean income tax rate for a given country, regardless of any family-

type specification. In addition, I address *tax progressivity* by calculating the Suits index (Suits 1977). Based on the Lorenz curve, this index measures progressivity (or regressivity) as the deviation from proportional taxation.

Information on family-related tax characteristics is derived from the Organisation for Economic Co-operation and Development country information (OECD 2000–2016). Similar approaches trying to code the OECD country report information into a comprehensive data set have been undertaken by Bettio and Verashchangina (2009) and Rastrigina and Verashchagina (2015), although for different points in time. In order to gather information from countries outside the OECD, a small online survey of national experts was conducted by the author. National experts were asked if certain family-related tax policies exist in their country in the year of observation. The information refers to each country's LIS data set year and has been made freely accessible through the OpenScienceNetwork by the author.[vi]

The prevalence of *joint filing* indicates if married couples are usually treated jointly regarding their income tax assessment. In some countries, this can also apply for unmarried couples. However, many countries with default joint filing have optional individual filing. The existence of joint filing does not necessarily say anything about the effective tax treatment and its economic outcome, this depending on the country-specific design of joint filing. Nevertheless, it usually hints at the potential beneficial treatment of married couples and familialization in the tax code. *Income splitting* is essentially the most radical version of joint filing. By aggregating the couple's incomes and calculating the tax burden on the total income, it establishes complete dependency between spouses regarding the income tax. However, although detailed schedules vary greatly across countries, in most cases unequally earning couples benefit. In addition, *dependent spouse allowance* prevalence provides information about additional tax deductions for having a non-working or low-paid dependent spouse. It is worth noting, however, that in effect joint filing and income splitting (for instance) can have similar or more severe consequences regarding the tax burden. In addition, the possibility of transferring unused own basic tax relief to the spouse functions somewhat similarly in many cases. Therefore, many other tax characteristics could provide some kind of 'hidden jointness' of couples. Lastly, *single-parent allowances* capture the beneficial treatment of single parents in the tax code. Table 1 shows the discussed tax characteristics for each country, sorted by their corresponding welfare state types. Clearly, there seems to be a higher prevalence of family-related tax characteristics in liberal and conservative welfare states.

[Insert Table 1 here

Table 1: Tax characteristics by country]

7. Method

I apply the classical budget incidence analysis approach, i.e. I compare pre- and post-tax income inequality assuming everything else equal (Caminada et al. 2019). I use multiple linear regression models in order to test hypotheses one to three. In all regressions, income inequality modification between family types, measured as the percentage change in Theil index, is my dependent variable. Hence, the dependent variable itself is already an estimation. Therefore, my method is best described as an estimated dependent variable approach (Lewis and Linzer 2005). Especially with small sample sizes, such two-stage estimation procedures can prove to be a valuable option. As an additional advantage, coefficients are easy to interpret (Nelson 2009). All estimates of standard errors and confidence intervals are derived using the bootstrap (reps=1000).[vii]

I aim to explain differences across countries by regressing the modification of income inequality on the tax indicators described in the previous sections. All results are presented without additional controls and with controls for tax rate and tax progressivity. Due to the small sample size (n=30), combining all indicators into one model does not seem to be a suitable option. Therefore, the interpretation of the results focuses on separate models for each tax characteristic. As it is not feasible to distinguish income taxes from payroll taxes in most countries, both categories are analyzed together. Therefore, the coefficients of income tax indicators possibly underestimate the pure impact of the tax policy characteristics.

In order to test my last hypothesis, I apply hierarchical cluster analysis using Gower's dissimilarity coefficient. Welfare states are clustered on the prevalence of tax benefit policies (see Table 1) and the percentage change in the Theil index. Gower's dissimilarity coefficient allows binary and continuous variables to be combined and hence is suitable for examining clusters in the prevalence of policy indicators and outcomes. The coefficient combines the absolute value distance of the continuous variables divided by the range of the variable with the proportion of matches between the binary variables (Gower 1971).

8. Results

To evaluate the relevance of the tax modification of income inequality between types of families, it is essential to scrutinize the reduction due to taxes *and* transfers in a first step. Figure 1 shows the percentage reduction of between-family-type income inequality that owes to taxes (diamonds) and transfers (circles) per country, sorted by their welfare state classification. As I consider the percentage reduction of inequality, a positive value indicates less inequality and a negative value more inequality. As the figure shows, countries differ substantially in their redistributional patterns. In general, all income tax systems reduce inequality between family types, but not all aggregated transfers do. At the mean (dashed orange line), income taxation reduces the Theil index by almost 17 per cent and transfers (dashed green line) by close to 12 per cent. Overall, there does not seem to be any systematic pattern: some countries have strongly equalizing tax systems but weak transfer systems (such as the Netherlands and Denmark), while the inverse is true in other countries (e.g. the UK and Germany). The Latin American countries generally have below-mean values for taxes and transfers, as do the Eastern European countries, with the exception of the Czech transfer system. It becomes clear, however, that income taxation is by no means less important than the transfer system. This clearly thwarts the predominant focus of sociological research on transfers only.

[Insert Figure 1 here

Figure 1: Percentage reduction in the Theil index]

Given that the tax system plays a crucial role in income inequality reduction between family types, I proceed by empirically testing my first hypothesis. As discussed above, the effective tax rate (level) and the progressivity of the tax schedule should be positively associated with the reduction of between-family-type income inequality. Therefore, I use the change in inequality that is due to taxation measured as the percentage change in the Theil index as the dependent variable and regress it on the mean effective tax rate and the Suits index for every country. Figure 2 presents the coefficients of the respective ordinary least squares (OLS) regressions.

As Figure 2 indicates, a higher level of taxation is associated with a greater reduction in inequality between family types, as expected in the first hypothesis. The correlation is statistically significant and increases when the progressivity index is added to the model. One additional percentage point in the effective tax rate is associated with an almost one additional

percentage point reduction in the Theil index. Against my expectations, however, the measure for tax progressivity is neither statistically significant nor has any explanatory power on its own. This may point to the relevance of family-related tax benefits that disturb the relationship between progressivity and inequality when looking at between-family-type inequality. In general, progressive taxes are most prevalent in the Latin American countries with overwhelmingly low tax rates. Hence, effective tax rate and tax progressivity are negatively associated (for a graphical clarification, see Figure A1 in the appendix). Therefore, the most progressive tax systems in the sample have the weakest redistributional power due to their low tax rates. This may explain the lack of explanatory potential of tax progressivity on its own. Once the effective tax rate is included, however, the progressivity index becomes positive and statistically significant, as expected.

[Insert Figure 2 here

Figure 2: Linear regression on the Theil index percentage change (tax structure)]

In order to test my second hypothesis, I include dummies for the family tax benefit characteristics from Table 1. I expected a negative relationship between the Theil index and familialization policies (i.e. joint filing, income splitting, dependent spouse relief) and a positive one for single-parent allowances. When the dummies are included, tax level and progressivity are always positively correlated with the reduction in income inequality between family types in all models (see Table A1 in the appendix for the full models). This may indeed hint at the role tax benefit policies play in interfering with tax progressivity. Figure 3 shows all separate models regarding the tax benefit coefficients, each with and without controlling for tax level and tax progressivity. The separate tax benefit dummy models, however, provide mixed evidence. First, all familialization characteristics have a negative coefficient once I include the controls. This is mostly in line with my expectation of decreased reduction in inequality between family types due to family-type-related tax benefits. Surprisingly and against my expectations, I find a negative coefficient for single-parent allowances, too. It is probable that many single-parent households have income levels below the basic relief or tax-free bracket and hence do not benefit much from their special allowance. However, not all characteristics are statistically significant. Hence, I find only weak evidence regarding the dependent spouse relief and the single-parent allowance. Nevertheless, joint filing in general and income splitting

in particular are strongly associated with a lower reduction in income inequality between family types. It is worth noting that the values of the coefficients are substantial. Controlling for tax level and tax progressivity, welfare states with joint filing reduce income inequality between family types almost eight percentage points less than countries with individual filing. This means that welfare states with joint filing have about half the inequality reduction of welfare states without it, when comparing predicted values.

[Insert Figure 3 here

Figure 3: Linear regression coefficients of separate tax characteristics]

In my third hypothesis, I single out married couples and examine income inequality between them and all other family types combined. This should provide indications if the modification of between-family-type inequality is exclusively driven by the special treatment of married couples. Figure 4 displays the linear regression results regarding the modification of income inequality between the two groups: married couples and others. In contrast to all previous models, progressivity and tax level are no longer significantly correlated with the reduction in between-group inequality (all details are provided in Table A2 in the appendix). This does indeed support the idea of tax benefits counteracting the general redistributional pattern of progressive income taxation. As Figure 4 shows, the dummies for dependent spouse relief and single-parent allowances do not provide much explanatory power. The dummy for joint filing is substantial and negative, yet alone not significant. The coefficient for income splitting, however, is more than three times as large and highly significant.

This indicates the significance of the tax treatment of married couples. However, the positive coefficient of dependent spouse relief in particular may suggest that the overall picture of between-family-type inequality is more complex than the treatment of married couples alone. Many countries provide tax allowances for dependent partners or let unmarried couples file jointly, just like married couples. Income splitting thus seems to be the one mechanism that is designed almost exclusively for married couples.

[Insert Figure 4 here

Figure 4: Linear regression coefficients of separate tax characteristics (married vs. others)]

Finally, in order to examine if the taxation of families results in 'families of taxation' clusters, I apply hierarchical cluster analysis using Gower's dissimilarity coefficient. Welfare states are clustered on the prevalence of tax benefit policies (see Table 1) and the percentage change in the Theil index. Figure 5 shows all countries and their respective dissimilarity from each other. The lengths of the vertical lines indicate the differences of observations, calculated as Gower's dissimilarity measure. The possibly resulting cluster solutions, however, are quite heterogeneous. The number of resulting clusters graphically depends on where a horizontal line can be drawn. In a four-cluster solution, the first cluster on the left consists of European countries with rather low tax policy familialism (they all provide single-parent allowances), whereas the second cluster from the left side is a surprisingly heterogeneous group. Interestingly, the most universalistic Scandinavian welfare states cluster together with rather rudimentary Latin American ones. They have the complete absence of family-related tax policies in common, whether because they deliberately abolished them or because they cannot afford them. In the third cluster we find the highly familialistic income-splitting welfare states. Lastly, on the right side, familialistic but low-redistributing countries form the fourth cluster. Although some patterns do fit the common clusters of welfare states, it becomes rather evident that there is no clear coherence between welfare state typology and families of taxation clustering.

[Insert Figure 5 here

Figure 5: Families of taxation clusters]

It is worth emphasizing that the cluster solutions heavily depend on the chosen variables and measures. However, Diane Sainsbury's (1999, p. 191) observation that family responsibilities in the tax system cut across welfare state typologies still seems valid.

9. Supplementary analysis

Especially due to the small sample size, the chosen inequality measure may strongly determine the findings from H2 and H3. I therefore run the very same regressions from Figure 3 with the percentage change in MLD as the dependent variable, instead of the Theil index. The results are provided graphically in the appendix (Figure A2). The overall picture, however, does not change. In addition, I run a third version using the OECD equivalence scale instead of the square root equalization used in the main results. As shown in the appendix (Figure A3), with the exception of the income-splitting dummy losing significance, all of the results remain surprisingly unchanged. In addition, I run the analysis of inequality modification between married couples and all others from Figure 4 with MLD. Again, the results do not change substantially (Figure A4).

However, it is worth emphasizing that in all models and regardless of the chosen equivalence scale, sample restrictions or inequality measures, the coefficients of joint filing and income splitting as genuine familialization policies are always negative and substantial. Furthermore, as one may argue, these findings may be completely driven by outliers. Therefore, I additionally run all models excluding one country each time (shown in Figures A5, A6 and A7 in the appendix). In particular, the Netherlands seems to strengthen some of the results, as the joint filing and income splitting coefficients become smaller when the country is excluded. Nevertheless, all major findings and interpretations remain valid.

Lastly, I address the relevance of familialization tax policies regarding overall *vertical* income inequality. To this end, I regress the tax policy indicators on the relative change in income inequality before and after taxation regardless of family type. As Figure A8 in the appendix indicates, the overall pattern is similar to what we have seen regarding horizontal inequality. The coefficients, however, are not significant. Nevertheless, this additional analysis suggests that welfare states with income splitting have about five percentage points lower vertical income inequality reduction.

10. Discussion

In this study, I have investigated the relationship between income taxes and the modification of horizontal income inequality between family types using harmonized data from 30 countries in the LIS. I have argued that taxation is a genuine aspect of social policy, which merits the attention of sociologists interested in comparative welfare state research. Throughout the analysis it became evident that income taxation is an essential instrument of horizontal

inequality modification. In line with my expectations, I showed that the average effective tax rate was positively correlated with the reduction in income inequality between family types. This also held for tax progressivity when controlling for tax level.

I then examined the role of familialization tax policies, which foster the individual's dependency on family context. These familialization policies in the tax code were found to be negatively associated with the welfare state's capacity to reduce income inequality between family types. As expected, joint assessment of married couples in general and income splitting in particular seemed to diminish the redistributional power substantially. The empirical findings suggest that the prevalence of joint filing cuts the tax-induced reduction in income inequality between types of families by almost half. Furthermore, dependent spouse allowances were also found to be associated with less inequality reduction. On the other hand, de-familialization policies appeared to strengthen individual autonomy and mitigate inequality. However, I did not find consistent evidence that single-parent allowances enhance redistribution between family types.

In addition and against my expectations, family tax benefit clusters did not map onto welfare regime types. The country clusters resulting from horizontal inequality modification and the prevalence of family-related tax policies cut across all existing classifications of welfare states. Although many scholars have found consistent welfare state clusters when examining common social policy indicators, this picture does not hold up to horizontal inequality modification in income tax. Rather, my tax cluster findings lie orthogonally to previously described patterns of social policy.

These findings relate to previous research in two ways. First, it seems that familialization policies in general not only hinder individual autonomy and gender equality (Orloff 1993; Saraceno 2016), but that in the case of taxation, these policies may create inequalities between types of families at the same time. Welfare states without joint filing not only have significantly higher levels of between-family-type inequality reduction but greater individual autonomy due to individual filing as a critical de-familialization policy. At the country level, this interpretation may imply a lose-lose situation of family dependency and income inequality. In this context, the individual is thus confronted with economically beneficial family dependency at the cost of a loss of individual autonomy. As familialization policies provide additional benefits for breadwinners with dependents, they discourage more autonomous individual arrangements.

Second and as widely discussed within the economic literature on labour market incentives for secondary earners, familialization policies in the tax code potentially hinder female labour

market participation. The tax code promotes a strong breadwinner model in most countries with joint filing and progressive income taxation due to lower marginal tax rates for the primary earner. Again, while this is widely known to exacerbate gender inequality (Sainsbury 1999; McCaffery 2009), as the study at hand indicates, it is also associated with greater income inequality between family types at the macro level.

This study is limited in several ways. First, the sample of 30 countries was not selected randomly. Nevertheless, external validity should be substantial due to the diverse set of countries. Second, the dependent variable measures inequality between the six most prevalent family types, but this fits some countries better than others. In countries with a high share of multi-generational households, the findings do not reflect the actual situation of many families. In particular, poorer households may be systematically excluded in the Latin American welfare states and hence inequality modification would be underestimated. Lastly, information on income taxation may be inaccurate due to tax evasion or informal work and so untaxed earnings are overlooked. Therefore, the results should be interpreted with caution.

The social and political implications are, however, manifold. First, familialization tax policies are not only associated with *horizontal inequity* as previous research has indicated. As this article has shown, these tax mechanisms may additionally foster *horizontal inequality*. In the light of rising inequality and escalating public debt, it is debatable whether these tax expenditures are desirable or affordable. For the public budget, tax benefits essentially represent a loss of revenue. In the German case, abolishing income splitting and introducing individual filing would lead to an estimated increase in income tax revenue of more than 1.1 per cent of GDP, which is more than 10 per cent of the total income tax revenue (Bach et al. 2011). Female labour market participation is expected to rise substantially, which may reduce the substantial gender pay gap. Furthermore, the additional tax revenue may be used for social transfers to the poor. In other words, politically these familialization tax policies seem to cut public revenue and foster inequality, while socially they appear to promote family dependency and a traditional division of labour.

This study contributes to our understanding of the consequences of institutionalized differences in the tax treatment of family types. It sheds light on the pivotal yet largely overlooked role of taxation when scrutinizing horizontal inequality between family types. Focusing on (de-)familialization tax policies with different consequences for inequality, this study emphasizes the role of family tax policy as a form of social policy.

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Tables and Figures

Table 1: Tax characteristics by country

Country	Effective tax rate in %	Suits index	Joint filing	Income splitting	Dependent spouse allowance	Single-parent allowance
Social-democratic						
Denmark	36.74	.027				yes
Finland	28.68	.062				
Iceland	30.59	.057				
Norway	29.09	-.015	yes	yes		yes
Sweden	32.76	.036				
Conservative						
Austria	30.01	.117			yes[1]	yes
Belgium	36.26	.092	yes[2]	yes	yes	yes
Germany	32.94	.075	yes[3]	yes		yes
Luxembourg	26.61	.099	yes	yes		yes
Netherlands	35.64	.061			yes[4]	yes
Liberal						
Canada	22.50	.122			yes	yes
Ireland	26.36	.206	yes	yes	yes	yes
Switzerland	30.36	-.001	yes		yes	yes
United Kingdom	20.79	.105				
United States	24.32	.162	yes[5]	yes		
Eastern-European						
Czech Republic	18.63	.100			yes[6]	
Estonia	18.22	.038	yes			
Lithuania	17.69	.011				
Slovakia	16.11	.035			yes[7]	
Mediterranean						
Greece	25.01	.114	[8]			
Israel	20.07	.247				yes
Italy	27.87	.199			yes	yes[9]
Spain	19.02	.172	yes			
Latin-American						
Brasil	11.02	.293	yes[10]		yes	
Colombia	06.58	.315				
Dominican Republic	02.47	.338	yes[11]			
Guatemala	14.53	.211				

Panama	11.04	.225	yes			
Peru	04.87	.346				
Other						
South Africa	24.81	.246				

Notes: [1] Sole-earner allowance if the spouse´s income is below a given threshold.

[2] Joint filing is mandatory for married couples.

[3] Joint filing is the default for married couples. Full income splitting is more advantageous if spouses have different incomes.

[4] This is an income dependent combination credit for spouses.

[5] The tax unit is the individual but couples have the option to file jointly. If married spouses file jointly, the phasing out of the personal exemption is below double the individual scheme.

[6] A tax credit if the spouse has income below a certain threshold.

[7] Additional allowance if the spouse´s income is below a certain threshold. Therefore coded as dependent spouse allowance.

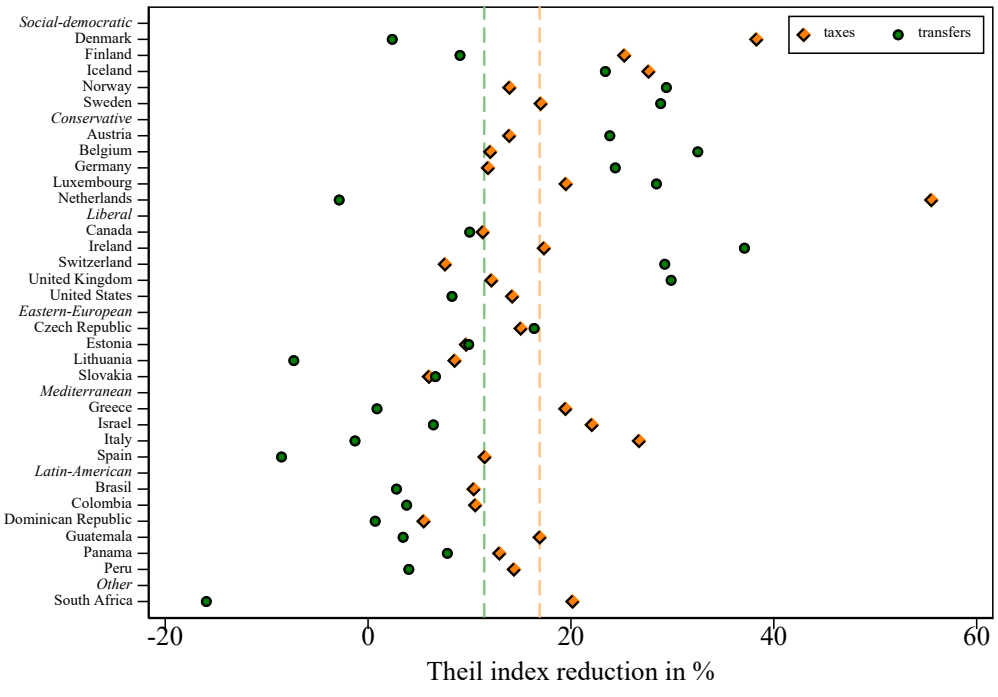
[8] Spouses are required to submit a joint tax return but are taxed individually. Therefore not coded as joint filing.

[9] Single-parents get a child allowance equal to the maximum of a married couple's dependent spouse and child allowance.

[10] Dependent spouse allowance is possible if spouses choose the optional joint filing, which is more advantageous if the dependent spouse has a low income.

[11] Spouses file jointly unless the women demonstrates her own income.

Figure 1: Percentage reduction in the Theil index



Note: Orange dashed line indicates the mean reduction due to taxes, green dashed line indicates the mean reduction due to transfers.

Figure 2: Linear regression on the Theil index percentage change (tax structure)

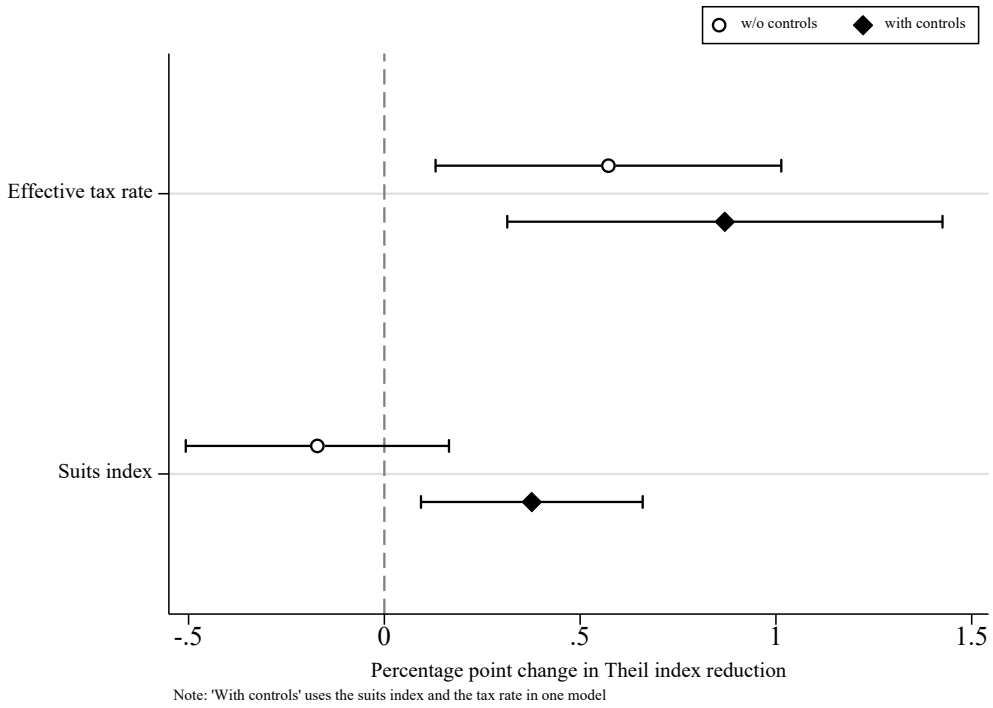


Figure 3: Linear regression coefficients of separate tax characteristics

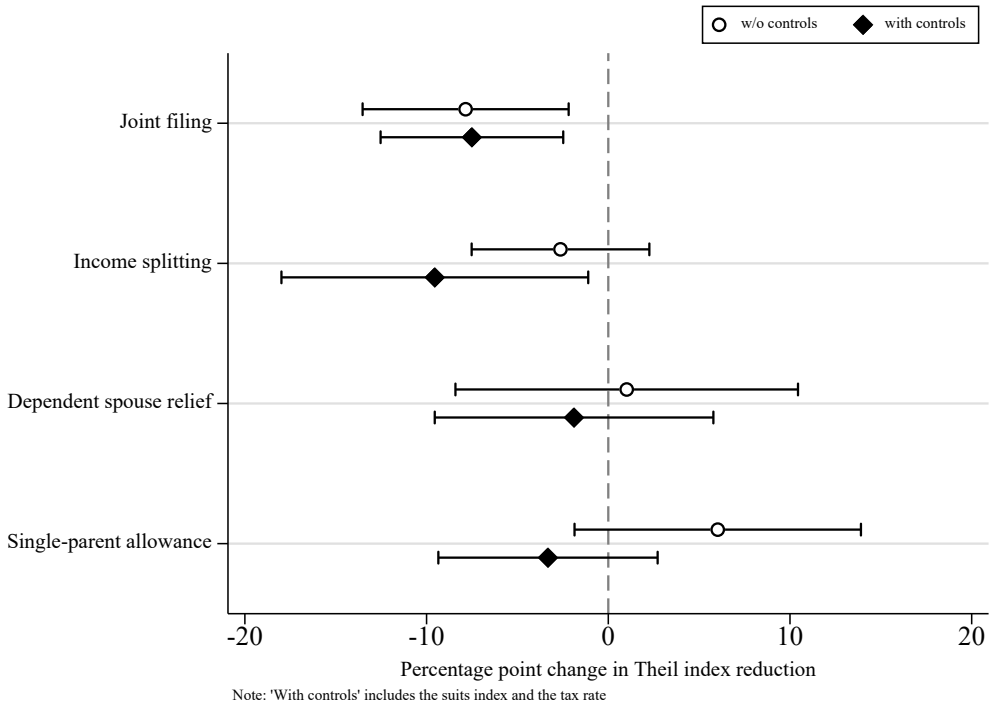


Figure 4: Linear regression coefficients of separate tax characteristics (married vs. others)

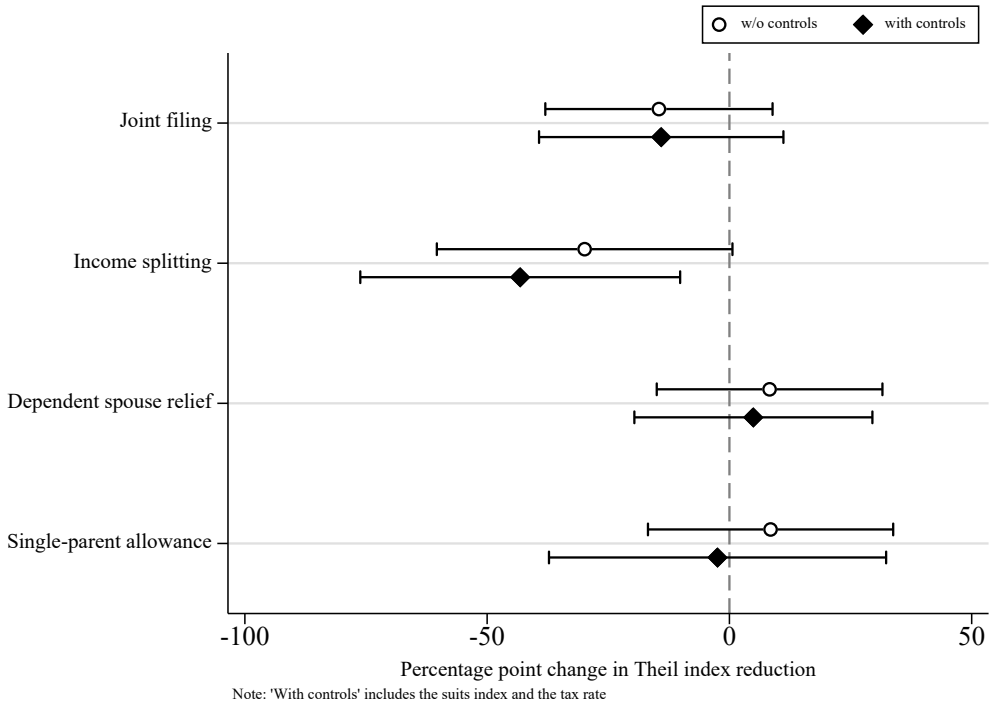
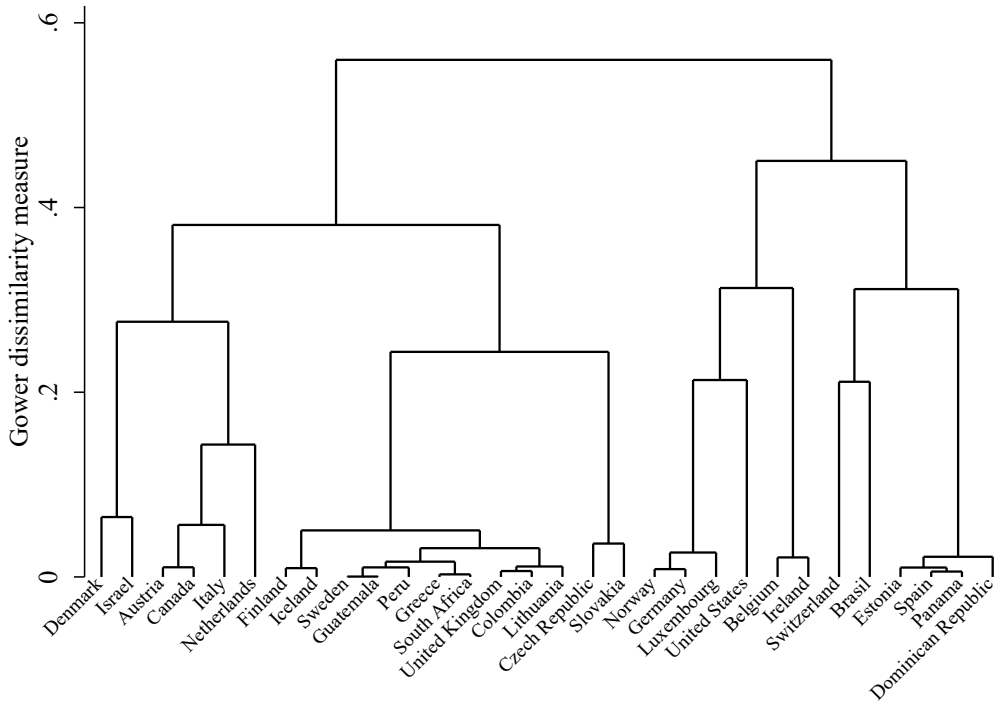


Figure 5: Families of taxation clusters



Supplementary Analysis

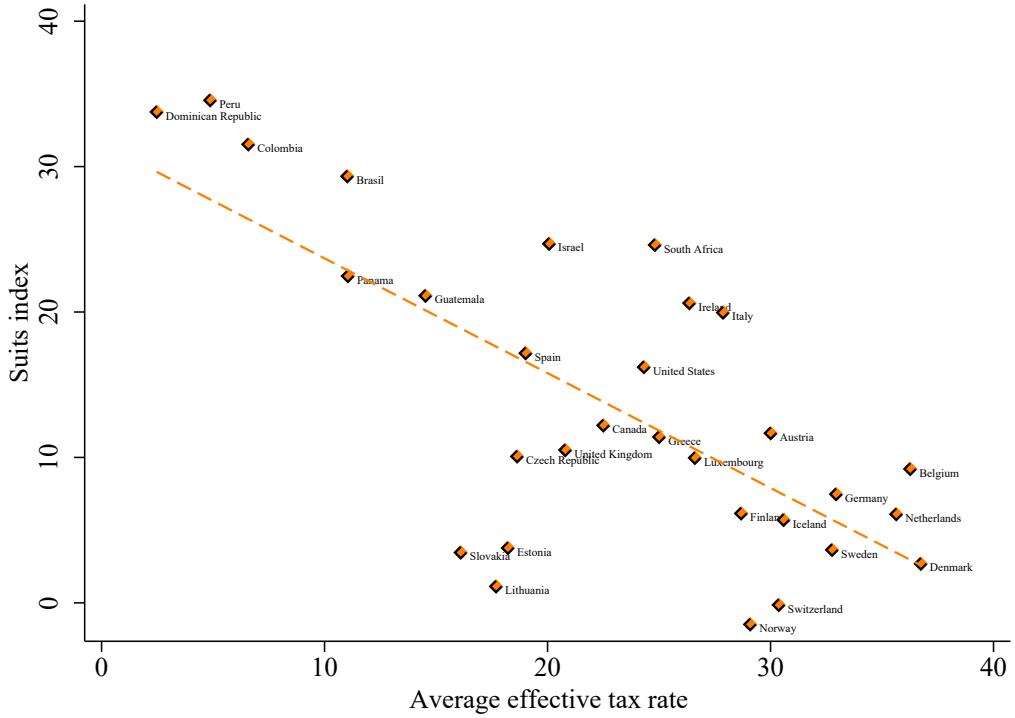


Figure A 1: Association of tax level and tax progressivity

Table A 1: Linear regression on Theil index percentage change (family tax benefits)

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)	Model (9)
Level	0.870**		0.858**		1.070***		0.897***		1.024***
	(0.279)		(0.266)		(0.295)		(0.256)		(0.305)
Suits index	0.377**		0.380**		0.443**		0.386**		0.434**
	(0.134)		(0.139)		(0.150)		(0.135)		(0.150)
Joint filing		-7.851**	-7.504**						
		(2.940)	(2.796)						
Income splitting				-2.630	-9.546*				
				(2.595)	(4.223)				
Dependent spouse relief						1.015	-1.884		
						(4.825)	(3.902)		
Single-parent allowance								6.024	-3.318
								(3.848)	(3.099)
Constant	-7.987	20.055***	-4.751	17.441***	-11.543	16.577***	-8.114	14.304***	-10.848
	(6.645)	(2.728)	(6.545)	(2.291)	(6.845)	(1.693)	(6.650)	(1.493)	(7.075)
R-squared	0.351	0.148	0.486	0.011	0.476	0.002	0.358	0.089	0.366
N	30	30	30	30	30	30	30	30	30

Standard errors in parantheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A 2: Linear regression on Theil index percentage change (family tax benefits): Married vs. others

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)	Model (9)
Level	0.870**		1.030		1.960**		0.980		1.303
	(0.279)		(0.599)		(0.607)		(0.687)		(0.977)
Suits index	0.377**		0.364		0.659		0.335		0.451
	(0.134)		(0.731)		(0.661)		(0.702)		(0.823)
Joint filing		-14.546	-14.072						
		(11.454)	(12.446)						
Income splitting				-29.879*	-43.175**				
				(14.754)	(16.198)				
Dependent spouse relief						8.291	4.945		
						(11.654)	(12.323)		
Single-parent allowance								7.037	-5.365
								(11.900)	(17.694)
Constant	-7.987	27.480***	-1.073	27.637***	-23.223	18.898**	-6.809	18.612***	-11.767
	(6.645)	(5.025)	(21.448)	(5.195)	(20.487)	(6.108)	(21.440)	(3.213)	(29.073)
R-squared	0.351	0.060	0.124	0.170	0.371	0.018	0.074	0.014	0.072
N	30	30	30	30	30	30	30	30	30

Standard errors in parantheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

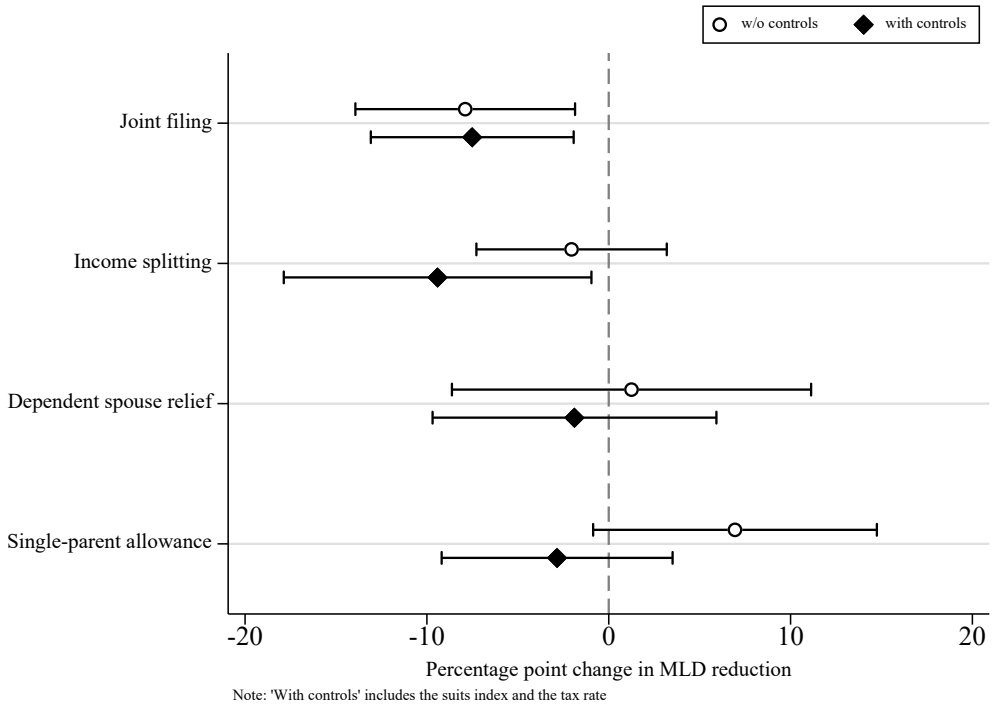


Figure A 2: Linear regression coefficients of separate tax characteristics

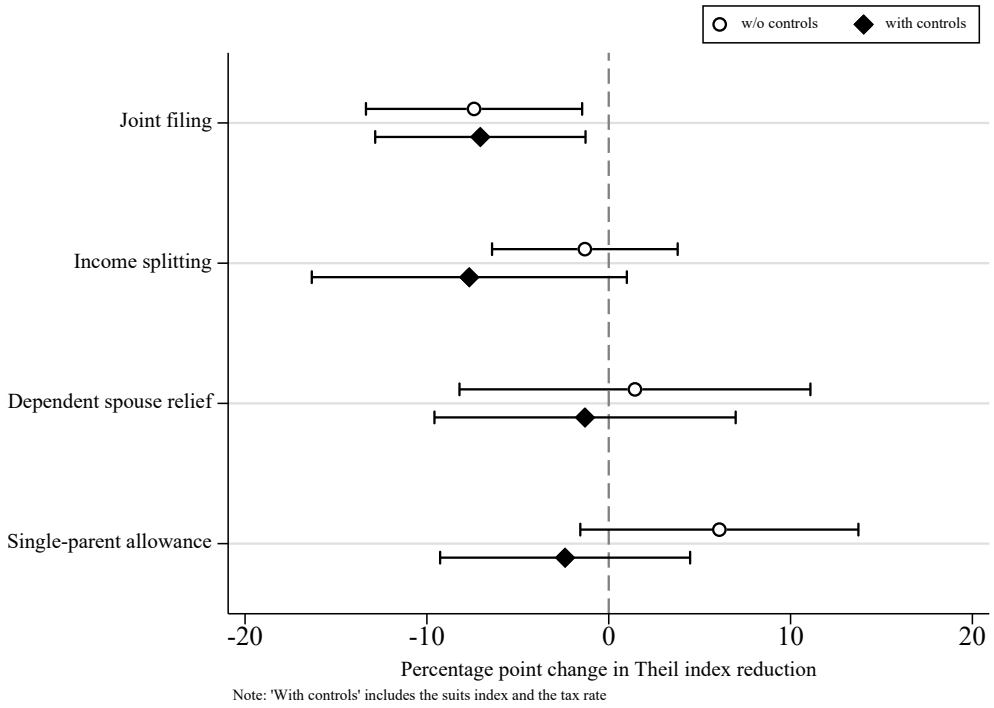


Figure A 3: Linear regression coefficients of separate tax characteristics (OECD scale)

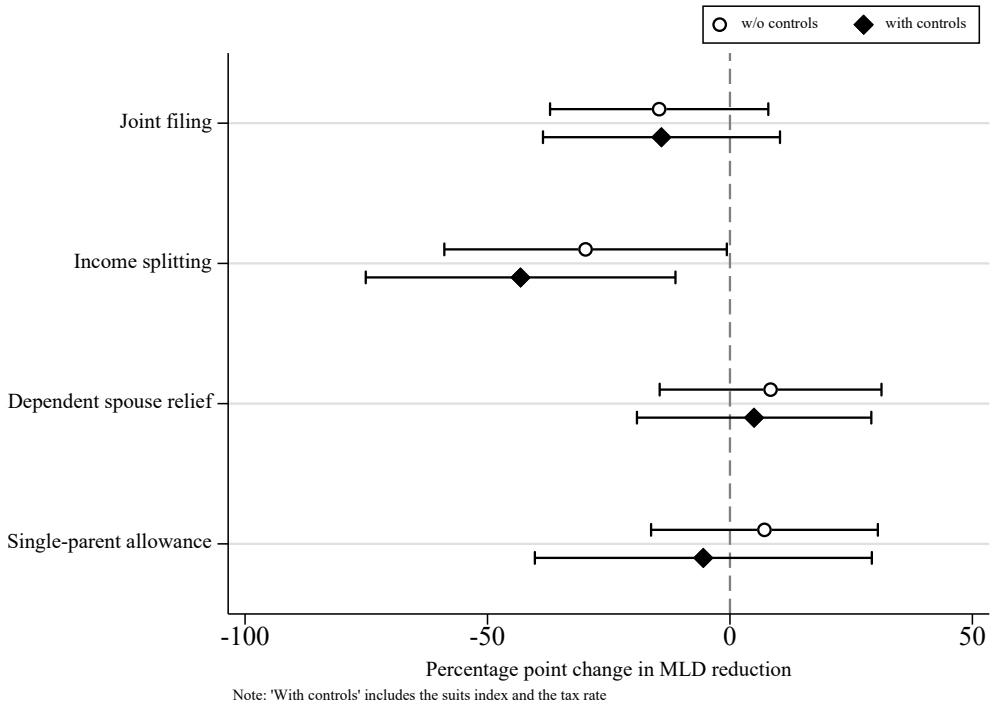


Figure A 4: Linear regression coefficients of separate tax characteristics (married vs. others)

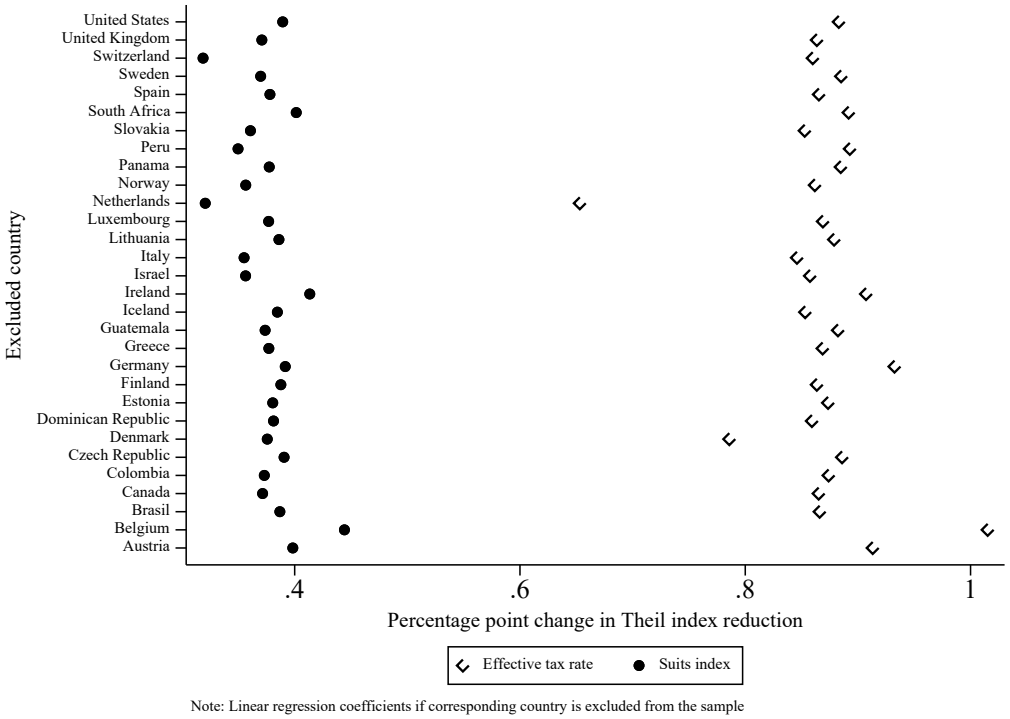
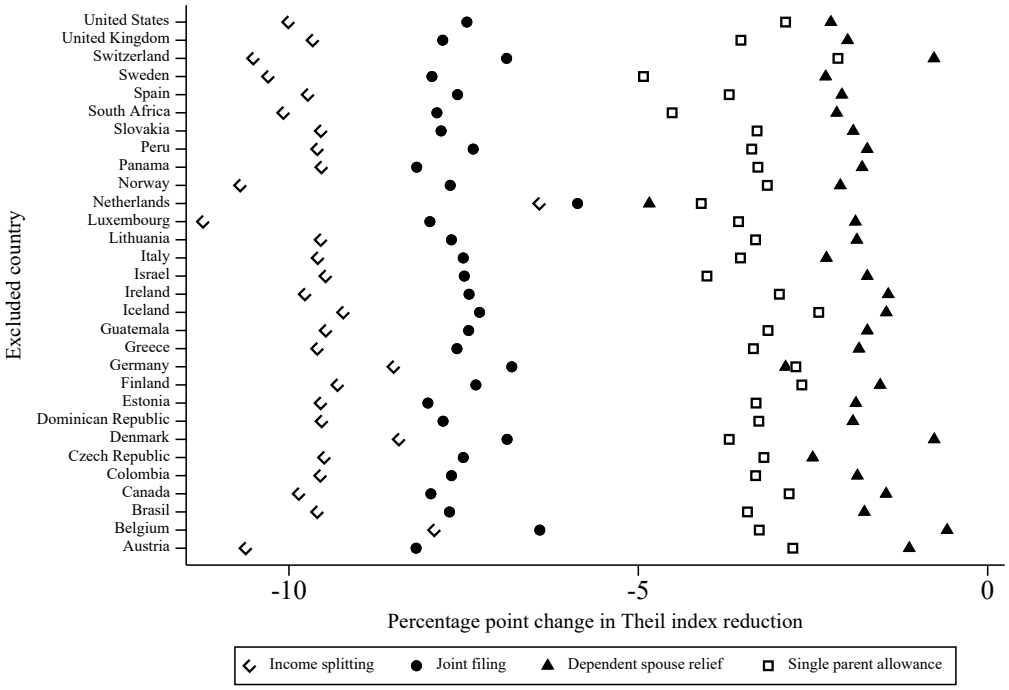
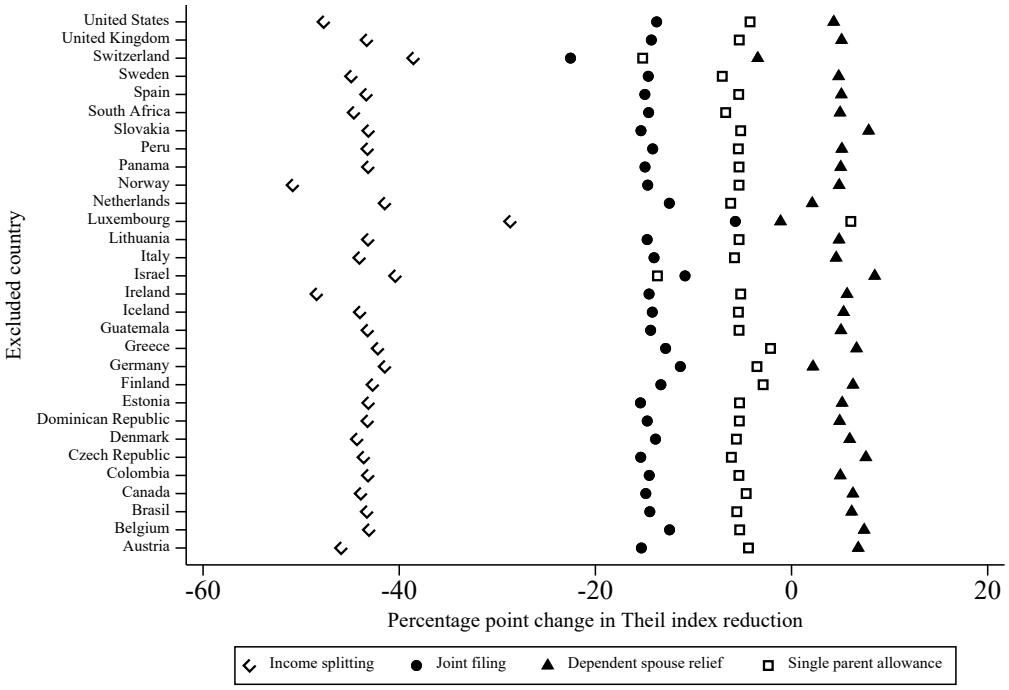


Figure A 5: Linear regression on Theil index percentage change (Tax structure)



Note: Linear regression coefficients if corresponding country is excluded from the sample

Figure A 6: Linear regression coefficients of separate tax characteristics



Note: Linear regression coefficients if corresponding country is excluded from the sample

Figure A 7: Linear regression coefficients of separate tax characteristics (married vs. others)

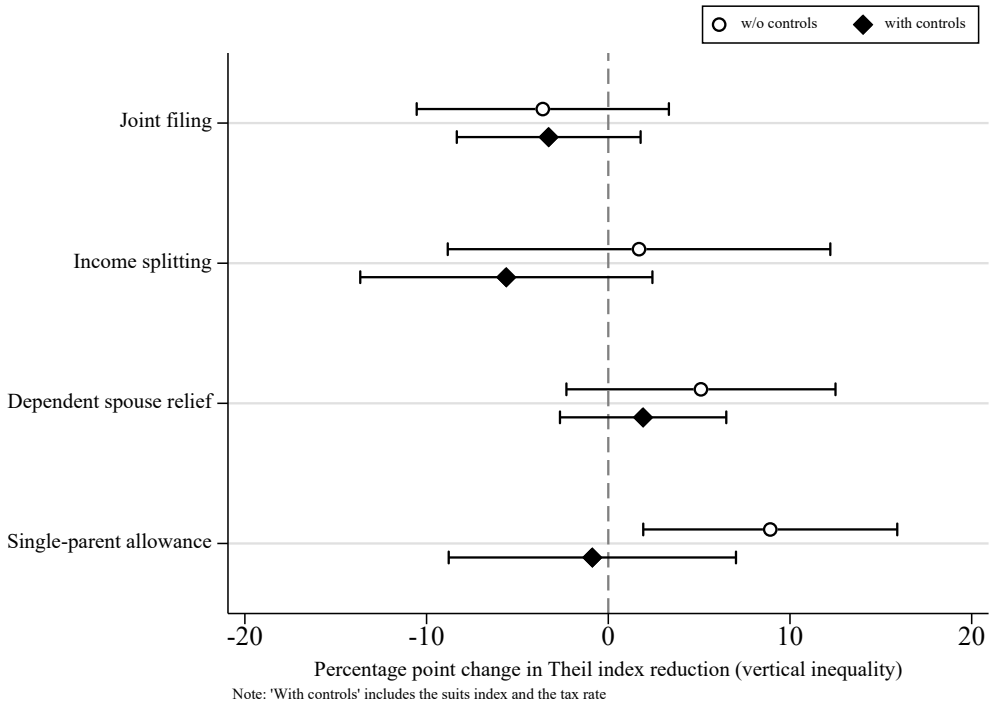


Figure A 8: Linear regression coefficients of separate tax characteristics (vertical inequality)

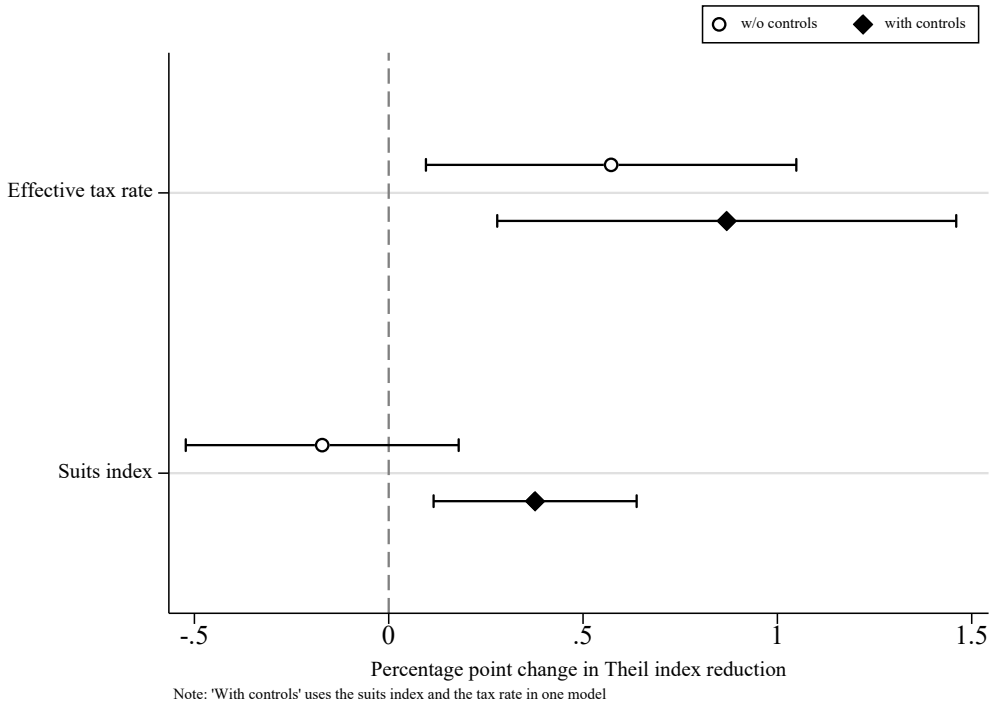


Figure A 9: Linear regression coefficients of separate tax characteristics (Jackknife standard errors)

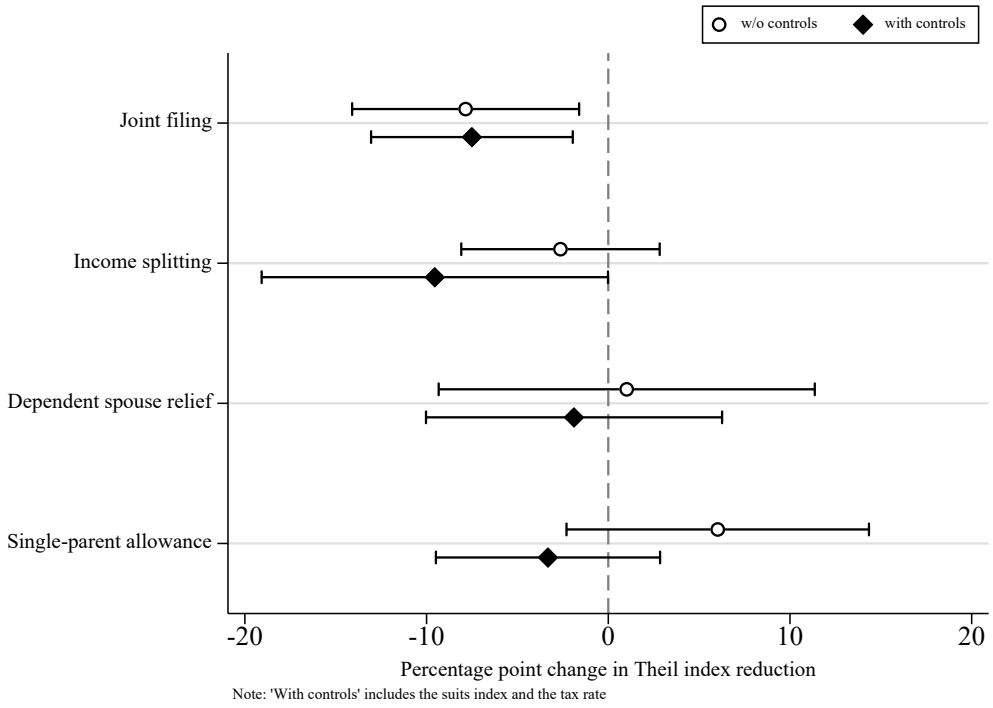


Figure A 10: Linear regression coefficients of separate tax characteristics (Jackknife standard errors)

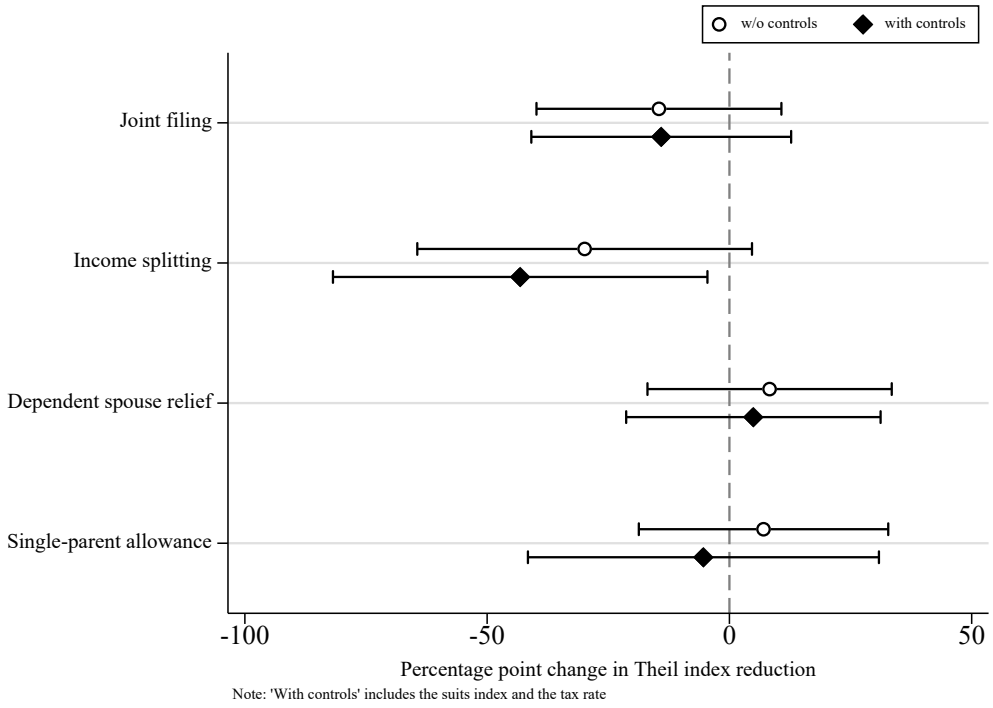


Figure A 11: Linear regression coefficients of separate tax characteristics (married vs. others - jackknife standard errors)

Endnotes

[i] The vast majority of economic literature on the topic examines the treatment of tax in the light of the fundamental principles of fair taxation or its relation to optimal taxation. Although related, this is not the prime focus of this article.

[ii] I choose these family types due to their prevalence in the overall population and because family-related tax policies are commonly designed to reflect marital status and the presence of children. I refer to 'family' instead of 'household types' because the distinction of married and unmarried couples is a genuine characteristic of families rather than of household composition.

[iii] Due to purchasing power parity adjustments in 2011 USD, this variation should not be a major issue.

[iv] Scholars have applied various strategies to deal with public pension schemes, such as excluding individuals with pension incomes (Gornick and Smeeding 2018; Guillaud et al. 2019) or controlling for the distributional effect of pension schemes (Kammer et al. 2012)

[v] The share of excluded households ranges from 0.65 per cent in Sweden to 39.66 per cent in South Africa. Besides the outlier of South Africa, only the Latin American countries have other household types of considerable magnitude (roughly 25 per cent). The six family types, however, account for about 95 per cent of all households in European countries.

[vi] Link here after anonymous review process.

[vii] Figures A9, A10 and A11 replicate the main analysis with jackknife instead of bootstrap standard errors. Nevertheless, the results do not change substantially.