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### **The Micro-Foundations of Permanent Austerity: Income Stagnation and the Decline of Taxability in Advanced Democracies**

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# **The micro-foundations of permanent austerity: Income stagnation and the decline of taxability in advanced democracies**

Olivier Jacques<sup>1</sup>      David Weisstanner<sup>2</sup>

## **Abstract**

The slowdown of economic growth and the stagnation of incomes for substantial parts of the population in recent decades are well-known. But what are the implications of these changes for the politics of taxation? The consensus in the literature is that income change either has no effect or that large income decline *raises* support for welfare policies. Focusing on the revenue side of the welfare state rather than the spending side, we present the opposite argument: We predict that economic decline makes individuals *less* tolerant of paying taxes, because tax increases would imply a reduction of their consumption level. We test this argument using longitudinal data from both repeated cross-sections and panel surveys in the United States, Canada and Japan. Our main finding is that tolerance of paying taxes is lower when individuals perceive that their economic situation deteriorates. Thus, perceived economic decline can create political obstacles against higher taxation.

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## Introduction

In a post-industrial service economy, social expenditures are on the rise due to aging, lower economic growth, and the maturation of welfare state commitments. These “irresistible forces” meet the “immovable objects” of the welfare state, since existing social programs are difficult to retrench as they generate popular and interest group support. The combination of these structural pressures and immovable objects significantly reduces governments’ fiscal room to maneuver, leading to what Paul Pierson calls an era of “permanent austerity” (Pierson 1998). Governments have responded to these pressures by increasing public debt (Streeck 2014), reducing less visible expenditures such as infrastructure investments (Jacques 2021), or using strategies of blame avoidance to retrench the welfare state (Vis 2016). Increasing government tax revenues has not been a prominent tool used by governments to alleviate the pressures of permanent austerity: government tax revenues have been stagnant, on average, since the end of the 1980s (Karczeski and Kiser 2020). This stagnation of revenues happens simultaneously to a growing demand for state intervention: new social risks generate public demand while traditional social policy remains popular (Hemerijck 2013).

Why are tax revenues stagnating despite rising expenditures? Pierson (2001) and Streeck (2014) suggest that governments have not responded to these structural pressures on the spending side by increasing tax revenues because the decline of wage growth has led to a decline of the “taxability” of post-industrial societies. The absence of wage growth for a large proportion of the population makes it difficult for governments to impose higher taxes on citizens, as it would imply a reduction in their consumption level (Pierson 2001; Streeck 2014). In this paper, we explore the micro-foundations of Pierson and Streeck’s argument and put their argument to a formal test by studying the question: What is the relationship between economic decline and tax policy preferences at the individual level?

We engage with a classic argument in the political economy literature going back to Meltzer and Richard (1981) which suggests that citizens facing adverse economic situations should prefer to increase welfare state effort. For example, Margalit (2013) finds that income shocks during the Great Recession increased support for welfare spending, at least among right-wing voters. Others argue that only very large income shocks influence preferences in this direction

(Owens and Pedulla 2014; O’Grady 2019; Wehl 2019), or that only income growth reduces support for redistribution while income decline has no effect (Ahrens 2021).

Most of these studies focus on preferences for welfare state effort or support for redistribution. Instead, we study how economic decline influences tax policy preferences – more specifically, tolerance of the level of taxation – which, as we show in this paper, are not correlated with preferences for redistribution. Building on Durr (1993), we argue that taxes are akin to a luxury good: demand for public spending paid for by taxation increases as individuals’ financial situation improves. We expect that when income is declining, citizens become *less* willing to pay taxes, because tax increases would imply a reduction of their consumption level. In contrast to support for redistribution, which is at least partly understood as “taking from the rich” (Cavaillé and Trump 2015), taxes impose direct costs to all taxpaying individuals. As individuals become worse off in absolute terms, they are less willing to provide resources to finance policies that partly benefit themselves and partly benefit others. This supports studies suggesting that the policy mood moves to the left under economic expansion and to the right during downturns (Stevenson 2001; Markussen 2008; Neundorf and Soroka 2018; Wlezien and Soroka 2021).

Our main empirical analysis draws on the General Social Survey (GSS) conducted in the United States. This high-quality survey allows us to analyze 24 waves of repeated cross-sections including the same questions of interest over more than four decades between 1976 and 2018. Moreover, we use the panel component of the GSS, which includes respondents interviewed three times between 2006 and 2014. While the United States is representative of a broader range of advanced democracies that have faced income stagnation for substantial parts of the population (Nolan and Thewissen 2018), Americans’ tax policy preferences may differ systematically from those of citizens of other advanced democracies. Therefore, to ensure the generalizability of our findings, we complete our analysis with the Canadian Election Study (CES) and the Japanese General Social Survey (JGSS), the only two multi-year surveys asking a question on tolerance of current income tax levels along with a question on respondents’ perception of their financial situation.

We contribute to a growing literature on the consequence of economic decline on policy preferences and make several theoretical and empirical contributions. To our knowledge, we are the first to study the effect of economic decline on tax policy preferences. Our main finding is that people are more likely to believe that the current level of income taxes are too high when their economic situation deteriorates, especially in subjective terms. This differs from the effect of respondents' current (relative) position in the income distribution: High-income individuals are less willing to pay taxes than the poor, but income *growth* is associated with tolerance of tax levels. The panel data analysis shows that the effect of economic decline is mainly explained by differences *between* individuals rather than changes in the financial situation of *the same* individual over time. The negative effect of subjective economic decline on tax preferences is independent from confounding factors and robust to all model specifications. In contrast, the effect of objective economic decline is more sensitive to confounding variables such as education which predicts both income growth and tax preferences.

We make three additional contributions. Firstly, we study the mechanisms linking economic decline to tax policy preferences and find that economic decline reduces social trust, which in turn, is associated with less tolerance for tax levels. Secondly, we contribute to the debate about whether objective or subjective economic circumstances are stronger predictors of policy preferences (Stevenson and Duch 2013; Gimpelson and Treisman 2018). We develop an innovative measure of objective income growth by estimating life-cycle individual income trajectories. However, our findings indicate that *perceived* financial changes matter more than objective income growth. Thirdly, we contribute to the literature on the effect of education on policy preference (Attewell 2021; Stiers et al. 2021; Hooghe, Marien, and De Vroome 2012) as we show that university-educated respondents are more likely to tolerate tax levels and are less influenced by changes to their personal economic situations than less educated respondents.

The next section presents our theoretical expectations about the impact of economic decline on tax preferences. The second section presents the data based on the GSS and discusses our innovative measurement of objective income growth for cross-sectional surveys by focusing on the US case. The third section presents the results of the cross sectional and panel GSS surveys. The fourth section briefly discusses the CES and JGSS and presents the results of the Canadian

and Japan cases, confirming those of the GSS. We conclude with a discussion of the broader relevance of our findings for comparative political economy.

## **Permanent austerity and the decline in taxability**

The literature on the effect of economic shocks on political preference reveals that exposure to a shock shifts individuals' preference towards more interventionist and left-wing inclinations, as citizens demand a stronger safety net (Margalit 2019, 2013). Based on self-interest, income losses (Rueda and Stegmueller 2019) and unemployment (Rehm 2011) increase support for redistribution. Studies relying on panel data find that income growth reduces preferences for redistribution (Gidron and Mijs 2019; Owens and Pedulla 2014) and that income changes slowly shift individuals' preferences over time (Helgason and Rehm 2022).

Most of these studies of the effect of changes to economic conditions on public opinion focus on preferences for redistribution or on social protection rather than on the revenue side of the welfare state. Studies on tax preferences generally focus on tax progressivity. Building on models assuming that voters want to reduce their own tax burden while maximizing the share of public services they receive, political economists have shown that voters prefer to shift the tax burden towards high-income individuals and to reduce taxes on lower and middle-income citizens (Ballard-Rosa, Martin, and Scheve 2017; Barnes 2015; Stiers et al. 2021). In general, the public prefers higher progressivity but lower levels of taxation (Barnes 2015) and reacts to an economic crisis by demanding more taxes on the rich (Garcia-Muniesa 2019; Limberg 2020). Since few citizens perceive themselves be rich, voters' preference for higher taxes on the rich may be revealing a penchant to shift the burden of additional taxes on another group rather than reflecting people's willingness to pay higher taxes themselves (Cansunar 2021).

In contrast, the main outcome of interest of this paper is the *tolerance of the current tax level*. We argue that this outcome is conceptually distinct from preferences for redistribution or tax progressivity. Questions about tolerance of the current levels of taxes force citizens to make policy trade-offs between potential state benefits and their contributions through taxes. As we detail below, tolerance of tax levels is driven by income growth, education, and reciprocity. In contrast,

redistribution and tax progressivity focus on the (relative) difference in income redistribution or in the tax rate between individuals with low and high incomes. They mainly reflect attitudes toward “taking from the rich” (Cavallé and Trump 2015) that are more likely to be driven by self-interest. Preferences for redistribution and for tax progressivity are more popular among groups that can expect to be net beneficiaries of the welfare state (the poor) and less popular among likely net contributors (the rich). Hence, we argue that preferences for redistribution and for taxation are fundamentally different:

*H1. Preferences about tax levels are not correlated with preferences for redistribution.*

While most studies on the effect of economic shocks on redistribution preferences suggest that economic decline increases support for the welfare state, we contend that economic decline *reduces* support for taxation. Pierson (2001) and Streeck (2014) relate the “decline in the taxability” of societies in an era of permanent austerity to the decline of wage growth. As inequality has been rising and the benefits of growth have become less widespread, the income of a large proportion of the population has stagnated in recent decades (Nolan and Thewissen 2018). When wage growth was high, citizens’ real incomes were rising, which makes taxation less visible and voters less aware of taxation (Abbott and Jones 2021). It becomes politically easier for governments to increase taxes without reducing citizens’ consumption level (Streeck 2014).

Durr (1993) argues that declining real income is associated with shifts of the policy mood towards the right, because social insurance represents a “luxury good” that people discard when their income is reduced (see also Goodhart (2015)). In a laboratory setting, Fisman et al. (2015) find that subjects exposed to an economic recession become more selfish and less willing to pay taxes. Other studies have confirmed that economic downturns are associated with diminished solidarity between groups and a shift in the policy mood towards the right (Stevenson 2001; Markussen 2008; Neundorf and Soroka 2018; Wlezien and Soroka 2021). It is worth noting that several studies about redistribution preferences also support this “luxury good hypothesis”. Merola and Helgason (2016) and Weisstanner (2022) find that higher absolute income growth at the individual level is associated with more support for redistribution, while Neundorf and Soroka

(2018) find that the rich become more supportive of redistribution during economic booms. We thus pose the following hypothesis:

*H2a. Economic decline is associated with lower tolerance of tax levels.*

The idea that economic decline affects tax preferences rests on the assumption that individuals are aware about changes in their economic situation. This is by no means certain, because individuals hold widespread misperceptions about economic facts, such as the shape and changes of the income distribution, which may influence policy preferences more than objective indicators (Gimpelson and Treisman 2018). The perception of belonging to the middle of the income distribution by people who are actually closer to the top or the bottom of the income distribution affects their tax policy preferences (Cansunar 2021). We thus present a modified version of H2a based on *perceived* economic changes:

*H2b. Perceptions of economic decline are associated with lower tolerance of tax levels.*

Which mechanisms may explain how changes in economic circumstances affect tax policy preferences? The existing literature points to one particularly important mechanism: trust. To be willing to pay taxes, citizens must believe that governments will use their tax dollars wisely and that officials are not corrupt (Tuxhorn, D'Attoma, and Steinmo 2019; Svallfors 2013; Goubin and Kumlin 2022). Trust is a crucial determinant of tax preferences since they are driven by reciprocity; citizens are more likely to tolerate the tax burden if they believe that others are contributing their fair share and that the state provides enough benefits in return for taxes paid (Berens and Gelepithis 2021). Economic decline reduces individuals' satisfaction with the government and with existing institutions, leading to lower trust (Margalit 2019). High and relatively equally distributed economic growth emphasizes shared positive experience: all groups are "in the same boat", which generates social trust (Mérola and Helgason 2016). Goubin and Kumlin (2022) are among the first use a panel survey to show that changes in trust levels influence acceptance of tax levels. This leads to our third hypothesis:

*H3. Economic decline is associated with lower trust, which in turn reduces tolerance of tax levels.*



Our argument linking economic decline to lower tolerance to pay taxes may hide an omitted variable explaining both changes in economic fortunes and tax policy preferences: education. Indeed, as we confirm below, the highly educated have seen higher income growth in recent decades, particularly in the United States (Autor 2014; Weisstanner and Armingeon 2020). At the same time, they are the group that is the most willing to pay additional taxes since education is associated with several factors that increase willingness to pay taxes. Education increases citizens' knowledge about the relationship between taxes and public spending (Elkjær 2020; Stiers et al. 2021), citizens' patience to reap the benefits of a tax hike (Wang 2018), their institutional trust (Hooghe, Marien, and De Vroome 2012) and their perception of the deservingness of welfare state beneficiaries which fosters reciprocity (Attewell 2021). Hence, we argue that the highly educated may tolerate higher tax levels independently of changes to their economic situation due to these other factors. In contrast, several studies have found that economic voting for the incumbent is stronger among less educated citizens than tertiary educated citizens because their labor market position is more vulnerable (Fossati 2014; Singer 2011). Less educated voters are more likely to believe that social policies become unaffordable during an economic crisis than citizens with higher education and to reduce their demand for state support when the economy is doing worse (Kölln 2018). Therefore, we expect tax preferences among the less highly educated to depend more strongly on the change in their economic situation:

*H4. The effect of economic decline on tolerance of tax levels is stronger among the less highly educated than among the highly educated.*

## **Empirical analysis**

We test these hypotheses empirically using longitudinal survey data from the United States, Canada, and Japan. A longitudinal perspective is necessary to study variation in the change of individuals' economic situation. Moreover, we require surveys that ask about attitudes towards tax levels and about perceived economic changes. Using these criteria, our main analysis draws on the General Social Survey (GSS) conducted in the United States. In addition to covering a long time period of 24 waves of repeated cross-sections from 1976 to 2018, the GSS also provides panel

surveys of respondents interviewed three times between 2006 and 2014. To our knowledge, the only other two surveys that fulfill the above-mentioned criteria are the Canadian Election Study (CES) and the Japanese General Social Survey (JGSS).

In the following two sections, we focus on the GSS in the United States, since it is the survey including the same question on tax policy preferences that goes to the furthest back in time. We present the data and measures, as well as the empirical findings from both the cross-sectional and panel data analysis from the GSS. Subsequently, the last empirical section presents and analyzes the Canadian and Japanese surveys, in order to probe the generalizability of the findings from the United States to different contexts.

### **Data and measures (GSS, United States)**

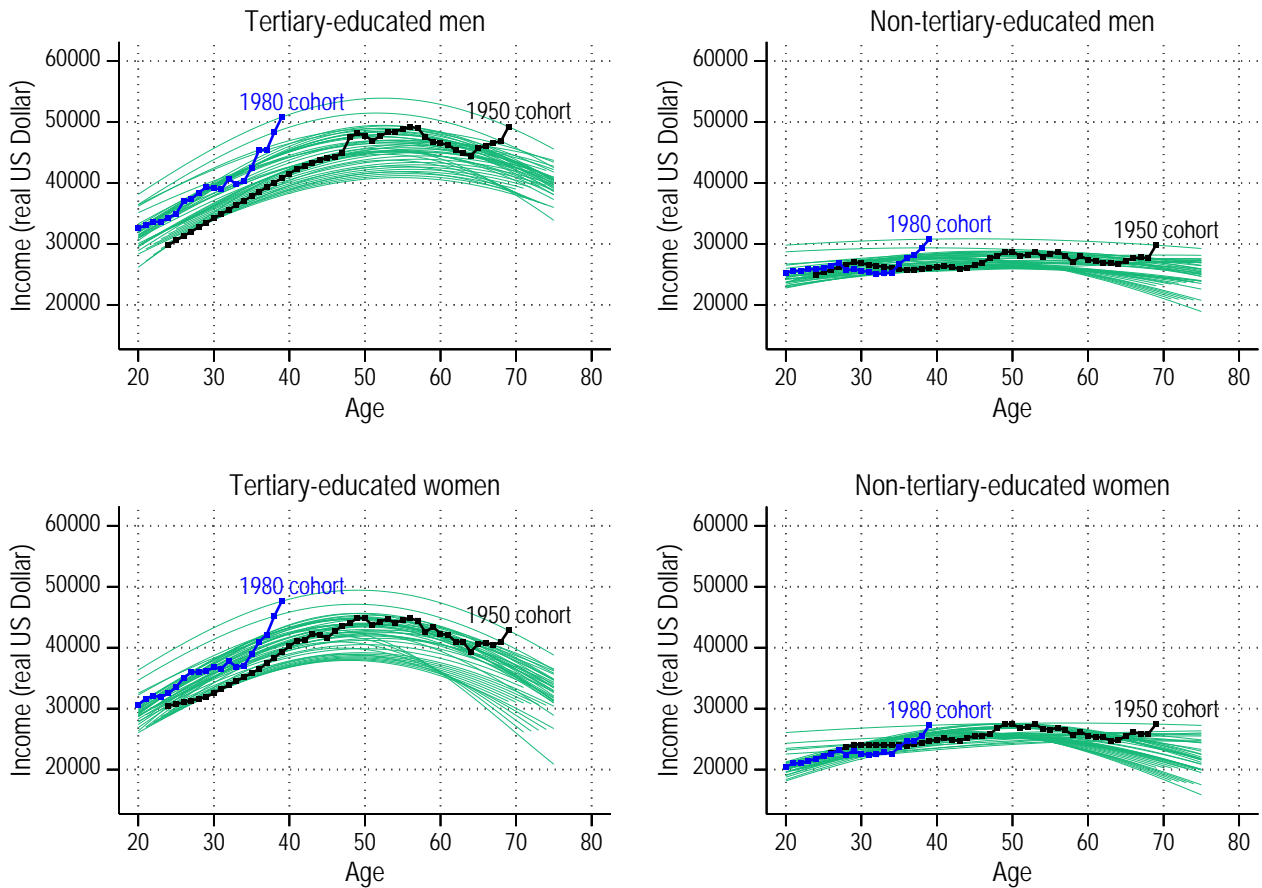
We analyze both repeated cross sections that were fielded annually or biennially from 1976 to 2018, as well as the panel survey fielded between 2006 and 2014. The panel data consists of three separate panel surveys, where individuals were interviewed biennially for a maximum of three waves (2006-2008-2010, 2008-2010-2012, or 2010-2012-2014). Although it relies on a short period, the panel surveys allow us to model the effect of changes in our main independent variables on changes in tax policy preferences for the same individual. Each panel started with about 2,000 respondents, and about 64% of respondents remained after the third round on average. Previous studies using the same panel have shown that attrition biases are small (Owens and Pedulla 2014). Still, we conduct additional analyses in Appendix 3 using GSS panel weights to ensure that attrition does not bias our results. Appendix 1 provides descriptive statistics for both the cross-sectional and the panel data.

The dependent variable is a question asking respondents “Do you consider the amount of federal income tax which you have to pay as too high, about right, or too low?”. Since only 1% of respondents think that taxes are “too low”, we group them together with respondents who think taxes are “about right” and code them as 1, whereas those who think taxes are too high are coded as 0. Thus, our dependent variable measures *tolerance of the current levels of the taxes that individuals have to pay*, as opposed to willingness to reduce the level of taxes.

We use two main independent variables: an objective estimate of respondents' income growth in recent years and a subjective measure of respondents perceived change in their financial situation. Cross-sectional surveys cannot directly measure income growth since they are not interviewing the same individuals over time. We thus estimate *objective income growth* from an external source, the Luxembourg Income Study (LIS 2022). The large LIS sample sizes, ranging between 46,954 and 99,000 households in the United States for the period covered, allow us to implement an innovative approach proposed by Rueda and Stegmueller (2019: 45-48) to estimate individuals' income trajectories over their life cycle. For each LIS survey year, we estimate a linear regression model of logged equivalized disposable household income and four explanatory variables – age, age squared, gender (female dummy) and education (tertiary dummy) – all interacted with each other. This leads to the life-cycle income estimates shown in the green lines in Figure 1 (one line for each LIS survey year). For high-educated US respondents, life-cycle incomes typically follow an inverted-U-shaped pattern. For non-tertiary-educated US respondents, income levels are lower and essentially flat over the life cycle.

Next, we transform these life-cycle estimates into income estimates by birth cohort (birth year = survey year – age) in order to calculate the income growth rates of the same (hypothetical) individuals over time. Figure 1 shows the example of two cohorts: High-educated cohorts born in 1950 have seen relatively strong and continuous income growth until the age of about 55, before income levels stagnate or decline. The high-educated 1980 cohort seems to be on track of a similar trajectory, but at higher levels and perhaps even stronger growth rates compared to the 1950 cohort. In contrast, among non-tertiary educated individuals, both the 1950 and the 1980 cohort have experienced hardly any income growth.

**Figure 1: Life-cycle income trajectories in the United States, 1974-2019**



*Note:* Life-cycle income estimates based on the Luxembourg Income Study. Green lines indicate life-cycle estimates separately for each LIS survey year.

Our actual measure for objective income growth is the percentage change in these cohort-specific income levels between the current year and the previous year. We match the LIS income growth estimates with the GSS survey respondents based on their birth year, education, and gender. Hence, our measure of objective income growth assumes that the income growth of every respondent in the GSS surveys each year corresponds to the mean income growth among those with the same birth year, gender, and education. We think that this approach is justified for three reasons. First, it improves on previous studies that have ignored life-cycle income changes and instead assumed that respondents at different points of the income distribution represent the same

individuals over time (e.g. Burgoon et al. 2019). Second, it improves on the original approach by Rueda and Stegmüller (2019) by using LIS income surveys with larger sample sizes and more precise income questions than the ESS, by adjusting for differences in household size, and by estimating trajectories for both men and women. Third, we used the GSS panel data to empirically validate our estimates. The bivariate correlation between the income levels estimated from LIS and the self-reported placement in the (rough) income brackets from the GSS is fairly strong ( $r=0.47$ ,  $p<0.001$ ,  $N=7,712$ ). The bivariate correlation of changes *within* the same individuals (panel respondents) with these two income measures from LIS and GSS is also statistically significant ( $r=0.05$ ,  $p=0.012$ ,  $N=7,712$ , robust standard errors clustered by individuals used).

This lends some validity to our objective income growth measure, especially given the relatively crude way of estimating income trajectories based on just three characteristics (age, gender, education).<sup>1</sup> At the same time, the imperfect correlations might indicate that these objective measures are not accurately perceived by individuals. As theorized in H2b, we therefore include a second main independent variable: *perceived change in one's financial situation*. Respondents were asked the question “During the last few years, has your financial situation been getting better, worse, or has it stayed the same?”. Their answers are coded as a categorical variable in three categories: (3) if their economic situation has been getting better, stayed the same (2) or worse (1). This measure has the advantage of representing a simple but broad evaluation of one's economic situation: respondents take into account not only their labour income but also their financial or residential assets when they evaluate their financial situation (Ansell 2014). However, this subjective evaluation may also be influenced by socio-tropic considerations, especially perceptions of the overall economy. Still, we believe that it is pertinent to test our hypothesis with two different indicators, objective and subjective income growth; although subjective economic perceptions are influenced by objective conditions, they are not measuring the same concept (Nadeau, Lewis-Beck, and Bélanger 2013).

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<sup>1</sup> We refrained from adding respondent's race to the LIS income growth estimates because the LIS data from Canada does not measure a respondent's race and we want to ensure that our measure can be replicated in multiple countries. However, the inclusion of race in our regression models does not influence our findings (see Appendix 2).

This subjective measure of change in economic circumstances correlates reasonably – but not perfectly – with our objective measure. Pooling across all GSS rounds in the cross-sectional sample, individuals indicating a “better” position had an average income growth of 1.05%, compared to 0.51% for “stayed same” and 0.26% for “worse”.<sup>2</sup> These differences are statistically significant from each other at  $p < 0.001$ . Similarly significant differences are also visible *within* education groups: Non-tertiary educated respondents who perceive a “better” position had an average income growth of 0.74% compared to 0.14% for perceiving a “worse” position. Among tertiary-educated respondents, the corresponding income growth rates are 0.81% (“worse”) and 1.83% (“better”). Looking at change *within* individuals using the GSS panel data confirms these patterns. Moving perceptions from “worse” to “same”, or from “worse” to “better”, leads to a statistically significant increase in objective income growth within panel respondents ( $p < 0.028$  and  $p < 0.001$ , respectively, with standard errors clustered by individuals). Overall, these correlations point to the validity to both the objective and subjective measures of economic growth and decline, but they also indicate that the two measures are not merely substituting each other.

### ***Control variables and statistical modelling***

Our models control for determinants of tax policy preferences that may also influence income growth. We therefore control for (completed) tertiary education, as well as for age, its square, gender, being unemployed or retired. We also control for income levels, since previous studies suggest that it influences tax preferences. Sumino (2016) finds that higher income is correlated with support for lower levels of taxes, whereas Edlund and Johansen Seva (2013) find that poorer voters are unwilling to pay more taxes. With the GSS, we control for income deciles based on the “midpoint approach” following Donnelly and Pop-Eleches (2018: 358-359), by assigning midpoints of the income bands shown to respondents and applying a correction for imputing the midpoint of the top category. We also adjust for household size by dividing income with the square root of household members.

We test for causal mechanisms linking economic conditions to tax preferences by including a measure of social trust which is measured with a question about whether most people can be

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<sup>2</sup> The standard deviation in objective income growth is 2.12%.

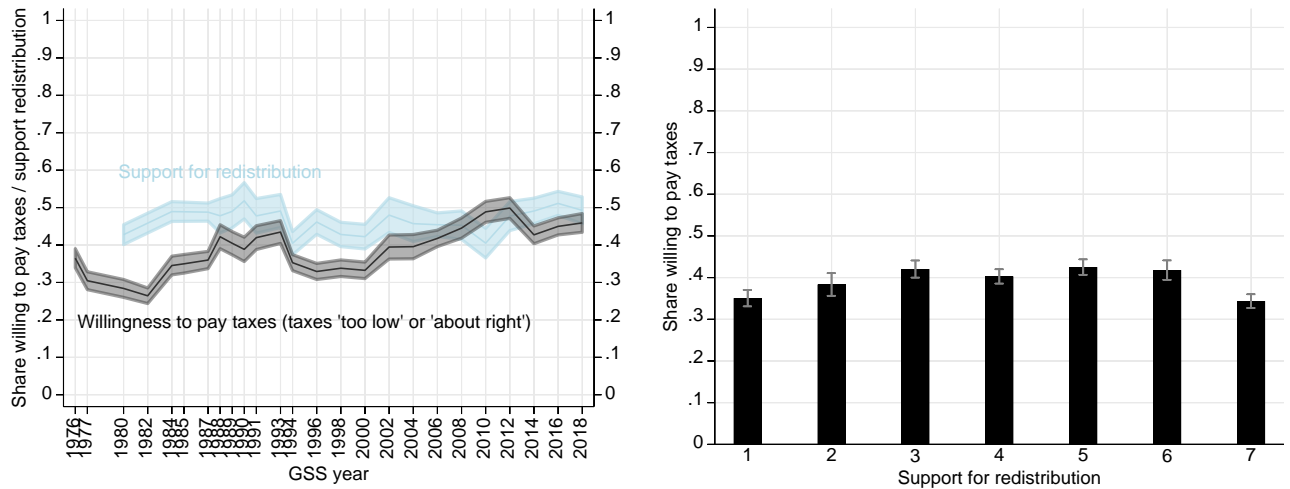
trusted or not. Unfortunately, we cannot include measures of institutional trust, which are not available for multiple years. Finally, to test H1, we use a measure of support for redistribution, based on a question about whether the “government in Washington should reduce income differences between the rich and the poor”.

We use two types of statistical analyses. First, we perform pooled cross-sectional analyses with linear probability models using OLS and year fixed effects (using logistic regression does not influence the results; see Appendix 2). The year fixed effects account for common shocks to all respondents. Since they would lead to collinearity with macro-level variables, we only include other macro-level control variables in the robustness specifications presented in the appendix, which does not substantively influence our results. Second, for the panel data analysis, we estimate a “hybrid model” with random effects distinguishing the effects of both changes *within* individuals (analogous to fixed-effects estimates) and *between* individuals. This model not only allows for a flexible estimation strategy to estimate within- and between-group effects (Bell, Fairbrother, and Jones 2019), it has also been used in recent studies on the effect of income changes on other political outcomes (Jungkunz and Marx 2021). We use robust standard errors (clustered by individuals in the panels) and year fixed effects in both models.

## **Findings (GSS, United States)**

We start with a descriptive overview of our main dependent variable, tolerance of tax levels. Figure 2 shows that the share of respondents in the United States who say that taxes are “too low” or “about right” has varied over time. Overall, the figure shows an upward trend in tolerance of tax levels from below 30% in the early 1980s, to about 50% around 2010. In contrast, there is no clear trend in support for redistribution, i.e. the share of respondents wanting the government to reduce income differences. We also do not find a statistically significant correlation between willingness to pay taxes and support for redistribution (measured as a dummy or as a continuous variable from 1 to 7). The right-hand panel of Figure 2 confirms that tax preferences are very similar at any level of support for redistribution. In line with H1, tax and redistribution preferences in the United States are not correlated. The drivers of tax preferences therefore may differ significantly from the drivers of redistribution preferences.

**Figure 2: Tax and redistribution preferences in the United States, 1976-2018**



*Note:* Estimates with 95% confidence intervals.

Table 1 presents the results of our regression models predicting tolerance to pay taxes in the United States. Table 1 is based on the cross-sectional data for the time period 1976-2018, while the panel data analysis for the period 2006-2014 follows below in Table 2. Model 1 is our main model to assess the association between objective and subjective change in economic circumstances and tax preferences. Models 2 and 3 test the trust mechanism (H3), while Model 4 tests the interaction between income growth and education (H4).

Model 1 in the cross-sectional analysis shows that subjective economic improvement, but not objective income growth, is significantly and positively associated with tolerance for tax levels. The substantive magnitude of the effect of subjective economic improvement is considerable. Based on our linear probability model, the estimated probability to tolerate taxes increases from 30.9% among those with a “worse” financial situation to 37.1% and 38.3% among those with the “same” or “better” financial situation. We can also use a logistic model based on Model 1 (presented in Appendix 2), to discuss the size of the effects: relative to a perception of a decline in financial situation, an improvement of one’s financial situation increases the odds to tolerate tax levels by 47%, which is the second-largest effect of the coefficients included in the model after having a tertiary education, which increases the odds to tolerate tax levels by 64%. The effects of



objective and subjective economic changes are very similar if we include only one measure at a time (Appendix 2).

**Table 1: Regression models predicting willingness to pay taxes in the United States: Cross-sectional analysis (1976-2018)**

Dependent variable:	Tax	Trust	Tax	Tax
	(1)	(2)	(3)	(4)
Income growth	0.004 (0.003)	-0.006 (0.004)	0.005 (0.005)	0.007* (0.004)
“Same” financial situation (ref: “worse” situation)	0.062*** (0.010)	0.004 (0.013)	0.063*** (0.014)	0.069*** (0.011)
“Better” financial situation (ref: “worse” situation)	0.074*** (0.011)	0.050*** (0.014)	0.078*** (0.015)	0.084*** (0.012)
Tertiary education	0.117*** (0.010)	0.212*** (0.013)	0.095*** (0.014)	0.157*** (0.021)
Trust			0.098*** (0.011)	
Tertiary*income growth				-0.004 (0.004)
Tertiary*“same” situation				-0.037 (0.026)
Tertiary*“better” situation				-0.049** (0.024)
Income decile	-0.023*** (0.002)	0.025*** (0.002)	-0.025*** (0.002)	-0.023*** (0.002)
Age	-0.014*** (0.002)	0.012*** (0.003)	-0.017*** (0.003)	-0.014*** (0.002)
Age <sup>2</sup>	0.000*** (0.000)	-0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Female	-0.045*** (0.008)	-0.009 (0.010)	-0.048*** (0.011)	-0.046*** (0.008)
Unemployed	0.011 (0.023)	-0.066*** (0.023)	0.028 (0.031)	0.011 (0.023)
Retired	0.017 (0.017)	0.013 (0.023)	0.008 (0.024)	0.018 (0.017)
Constant	0.705*** (0.049)	-0.081 (0.058)	0.740*** (0.065)	0.692*** (0.049)
Observations	28,222	15,501	15,501	28,222
R <sup>2</sup> (overall)	0.048	0.116	0.056	0.049

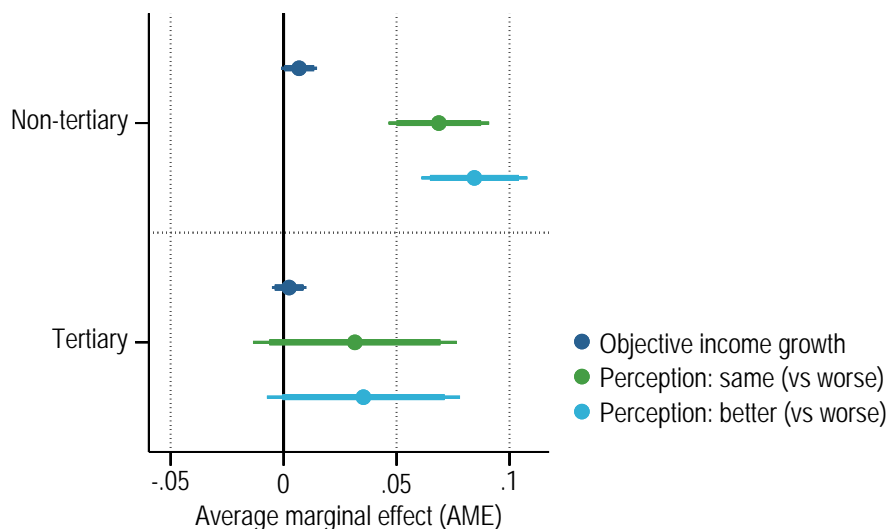
*Notes:* Linear probability models with robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year dummies included (not shown here).

Models 2 and 3 study the trust mechanism. Model 2 has trust as the dependent variable. It shows that respondents who perceive an improvement in their financial situation have higher levels

of trust. Model 3 shows, in turn, that trust increases tolerance of tax levels, confirming several previous findings (Tuxhorn, D'Attoma, and Steinmo 2019; Svallfors 2013). In Appendix 4, we also present a formal causal mediation model between trust, economic changes and tax preferences. It finds that interpersonal trust significantly mediates the effect of (perceived) change in financial improvement but that only about 5% of the effect of subjective income growth on tax preference is mediated by trust. Thus, we find weak support for H3, as the mediation effect is quite small.

Model 4 interacts education with objective and subjective economic changes. The interaction between tertiary education and improvements to one's subjective financial situation is statistically significant. Figure 3 presents the average marginal effects to visualize the interaction effects. Among respondents who are not tertiary educated, improvements to one's subjective financial situation are associated with significantly higher tolerance of tax levels ( $p < 0.001$ ). In contrast, among the tertiary educated, improvement of one's financial situation has no statistically significant effect ( $p = 0.105$ ). Although the interaction between objective income growth and education is not significant, the marginal effects reveal that objective income growth is significant at  $p = 0.089$  among those that are not tertiary educated. These conditional effects are in line with H4. Presumably, education is associated with a range of factors like information and higher trust that lead to higher tax tolerance independently of economic changes.

**Figure 3: The conditional impact of education**



*Note:* Average marginal effects with 90 and 95% confidence intervals, calculated from Model 4 in Table 1.

The results of Table 1 are robust to several alternative specifications presented in Appendix 2. First, instead of year dummies, we include GDP growth and unemployment rate, two macro-economic variables that may influence income growth and tax preferences. Moreover, recognizing that levels of taxes and benefits may influence respondents' tax preference and their subjective financial situation (Sumino 2016; Berens and Gelepithis 2019; Boudreau and MacKenzie 2018), we extract a measure of the average amount of taxes paid as well as the average benefit received for each income decile for every year of the survey based on the LIS. This is expressed as a proportion of respondents' income. The inclusion of these variables does not alter our results. Second, using different time windows for objective income growth or using a non-linear objective income growth measure (three categories: decline, stagnation, and growth) also leaves our conclusions unchanged. Third, we control for partisan identification. While Democrats (especially those with higher education) are very likely to tolerate tax levels, the effect of economic changes on tax preferences remains unchanged. Fourth, when we remove education, one of the determinants of objective income growth, from the models, we find that objective income growth is significantly correlated with tax preferences. This is because education predicts both objective income growth and tax preferences. Lastly, the inclusion of race in our regression models does not influence our findings.

The models in Table 2 present a similar set of results based on the GSS panel data. Because the same individuals were surveyed repeatedly, the panel data allow us to distinguish effects *within* respondents (i.e. deviations from a respondent's average change in economic circumstances) and *between* respondents (i.e. the difference between groups with low and high income growth). Model 1 confirms that subjective income growth is once again a statistically significant predictor of tolerating tax levels. The *between* effects are significant at  $p < 0.001$  and indicate that individuals that are on average experiencing an improving financial situation are more likely to tolerate tax levels compared to those who are doing worse.

**Table 2: Regression models predicting willingness to pay taxes in the United States: Panel data analysis (2006-2014)**

Dependent variable:	Tax	Trust	Tax	Tax
	(1)	(2)	(3)	(4)
Income growth <i>within</i> respondents	0.002 (0.005)	-0.001 (0.006)	0.001 (0.006)	0.006 (0.006)
Income growth <i>between</i> respondents	-0.001 (0.006)	-0.000 (0.007)	-0.002 (0.008)	0.003 (0.008)
“Same” financial situation <i>within</i> (ref: “worse” situation)	0.029* (0.016)	-0.021 (0.018)	0.043** (0.021)	0.020 (0.020)
“Same” financial situation <i>between</i> (ref: “worse” situation)	0.124*** (0.023)	0.023 (0.028)	0.124*** (0.030)	0.162*** (0.026)
“Better” financial situation <i>within</i> (ref: “worse” situation)	0.031* (0.017)	-0.005 (0.021)	0.034 (0.023)	0.027 (0.022)
“Better” financial situation <i>between</i> (ref: “worse” situation)	0.133*** (0.024)	0.106*** (0.030)	0.123*** (0.031)	0.168*** (0.027)
Tertiary education	0.129*** (0.018)	0.190*** (0.022)	0.110*** (0.023)	0.221*** (0.038)
Trust			0.075*** (0.016)	
Tertiary*income growth <i>within</i>				-0.009 (0.006)
Tertiary*income growth <i>between</i>				-0.002 (0.011)
Tertiary*“same” situation <i>within</i>				0.030 (0.031)
Tertiary*“same” situation <i>between</i>				-0.143*** (0.050)
Tertiary*“better” situation <i>within</i>				0.016 (0.035)
Tertiary*“better” situation <i>between</i>				-0.125** (0.051)
Income decile	-0.022*** (0.003)	0.017*** (0.003)	-0.021*** (0.003)	-0.022*** (0.003)
Age	-0.016*** (0.004)	0.007* (0.004)	-0.018*** (0.005)	-0.016*** (0.004)
Age <sup>2</sup>	0.000*** (0.000)	-0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)
Female	-0.043*** (0.014)	-0.037** (0.017)	-0.029 (0.018)	-0.043*** (0.014)
Unemployed	-0.001 (0.025)	-0.029 (0.027)	0.009 (0.032)	-0.001 (0.025)
Retired	0.048** (0.022)	0.012 (0.026)	0.040 (0.030)	0.048** (0.022)
Constant	0.761*** (0.081)	-0.118 (0.095)	0.793*** (0.108)	0.719*** (0.083)
Observations	7,666	4,455	4,455	7,666
R <sup>2</sup> (overall)	0.041	0.111	0.047	0.042

Notes: Linear probability models with robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year dummies included (not shown here).

The *within* effects indicate that changes in financial situation produce changes in tax tolerance, but the effects are only statistically significant at  $p < 0.1$ . It is remarkable to find some hints for an effect within individuals because individuals are only observed for three waves over four years and not many respondents are experiencing changes to either their financial situation or tax preferences in such a short time frame. Longer panels are usually necessary to witness the behavioral impact of small within effects that cumulate over time (Helgason and Rehm 2022). Like in the cross-sectional analysis, the effect of objective income growth is not statistically significant.

Models 2 and 3 in Table 2 find very similar evidence for the trust mechanism as in the cross-sectional analysis. We find that improving financial situation (between individuals) is associated with higher trust levels, which in turn are associated with higher tolerance of tax levels. Finally, Model 4 of the panel data analysis finds a similar interaction between subjective income growth and education as in the cross-sectional analysis. Again, the interaction reflects mostly a between effects rather than within effects: Perceived improvement among non-tertiary educated respondents is significantly associated with higher tax tolerance ( $p < 0.001$ ), but is not significant among tertiary-educated respondents ( $p = 0.331$ ). Overall, these results lend both cross-sectional and panel evidence that perceived economic decline is associated with less tolerance of tax levels.

### **Analysis in Canada and Japan**

One could argue that the results of the GSS survey are not generalizable to other contexts because of Americans' peculiar attitudes toward taxation. Indeed, the United States remains one of the advanced democracies with the lowest tax level and smallest welfare state. Its culture is particularly individualistic and the party system has drifted towards the right, with the Republicans proposing relatively extreme tax policy reforms (Prasad 2018). Therefore, we believe that it is pertinent to demonstrate that the relationship we find between economic decline and tax preferences travels to other contexts.

To be relevant for our study, surveys must include a similar question on tolerance for tax levels and must ask about one's financial situation. These criteria lead to the exclusion of surveys

that only contain questions on tax progressivity, those that focus mostly on services rather than taxes and of the ISSP “Role of Government” surveys because they lack question on personal financial situation. Our extensive review of publicly available surveys pointed to only two national surveys that satisfied both criteria: the Canadian Election Study and the Japanese General Social Survey. The CES takes place at every federal election in Canada and contains the questions of interests in 2004, 2006, 2008, 2011, 2015. The JGSS asks the questions of interest annually from 2000 to 2003, in 2005, and biannually from 2006 to 2012.

Like the United States, Canada and Japan sustain relatively low levels of taxation, notably because they maintain low taxes on goods and services. However, Canada and Japan’s tax structure differ significantly from the United States in ways that involve different tax politics and that could influence citizens’ opinion about taxation.

Japan’s growth model is export oriented, its fiscal policy discourages private consumption and encourages savings (DeWit and Steinmo 2002), whereas the US and Canada’s growth model favors internal demand with low taxes on consumers (Haffert 2021). In contrast to Canada and the United States, Japan is a coordinated market economy relying on social security contributions that have been relatively easy to increase because they provide a direct link between contributions and benefits (Park and Ide 2014). However, Japan’s narrow tax base offering deductions to certain groups combined with targeted government spending on specific areas of the country fuels political conflict and raises public concerns about wasteful government spending (Park and Ide 2014; DeWit and Steinmo 2002). Japan’s social security system involves significant redistribution from working age families to relatively well-off pensioners which provokes a sentiment of tax injustice among the young (Chopel, Kuno, and Steinmo 2005). As such, the Japanese left has traditionally been in favor of tax cuts for the urban working class and governments have been caught in a low-tax/low-social spending/high deficit equilibrium (Chopel, Kuno, and Steinmo 2005; Park and Ide 2014).

Both Canada and the United States’ tax mix rely considerably more than Japan and other OECD countries on personal income taxes and maintain low value added taxes. Canada figures among the OECD countries relying the least on social security contributions, but the most on

property taxes (Jacques 2020). However, the tax-funded public health care system figures among the most important identity markers of Canadians, especially in relation to Americans, and Canadians are generally in favor of state intervention (Dufresne, Jeram, and Pelletier 2014). Some provinces, like Quebec and Nova Scotia, have reached levels of tax revenues that are comparable to Western Europe (Jacques 2020), suggesting that the role of the welfare state is more important in Canada than in the United States and Japan. Moreover, tax politics are less polarized in Canada than in the United States, as the Conservative party has generally adopted a gradual approach to tax reform rather than a radical tax cut agenda (PBO 2014). In brief, the structure of taxation and the context of tax politics in Japan and Canada differ significantly from the United States, which allows us to test the generalizability of our argument.

In Japan, the tax policy question asks, “Do you think the amount of income tax you have to pay is high?”. Respondents can answer a five category Likert scale ranging from “too low” to “too high” and have the option of saying that they pay no taxes or that they don’t know. The variable measuring tolerance of tax level is coded 1 if respondents think taxes are too low, somewhat low, or about right and 0 if they think they are too high. When excluding respondents who don’t know and those who pay no taxes, only 21.8% of respondents tolerate the current level of taxes.

In Canada, the tax policy question asks if personal income taxes should be increased, decreased, or kept the same as now. Despite the progressivity of the income tax structure, a large proportion of Canadians pay personal income taxes (Milligan 2021). We can therefore assume that respondents are thinking about their own taxes when answering this question. On average, after removing the “don’t knows”, 44.2% of respondents think personal income taxes should be decreased, 49.6% think they should stay the same and 6.1% think they should be increased. To ensure consistency with the other surveys, we create a dichotomous variable opposing those who think personal income taxes should be decreased and those who think they should be increased or kept the same. The effect of economic changes remains the same if we use a three-category dependent variable.

The financial situation question is the same in the JGSS as in the GSS but the wording changes slightly in the CES.<sup>3</sup> The Japanese are more pessimistic than Canadians, since only 6.6% of Japanese believe that their financial situation has improved (45.3% think it has worsened), in contrast to 17.4% of Canadians thinking their financial situation has improved and only 26.6% thinking it has worsened. We use our novel technique presented above to create an objective income growth measure for Canada, but we cannot do the same for Japan, as we only have access to one LIS survey year for the years covered by the JGSS. We include the same control variables as in the GSS: tertiary education (completed), income, age, gender, dummies for retired and unemployed respondents, and a measure for social trust. Descriptive statistics are provided in Appendix 5.

Table 3 presents the results of our regression analysis of tolerance about tax levels in Canada (based on the CES) and Japan (based on the JGSS). For each country, we present the same four models as in the US analysis: Models 1 and 5 with the main results; Models 2-3 and 6-7 for the trust mechanism; and Models 4 and 8 for the interaction between economic changes and education. We find remarkably similar results for our main explanatory variables as in the US. Both in Canada (Model 1) and in Japan (Model 5), a stable or improved financial situation is significantly associated with higher tolerance for tax levels. The coefficient for objective income growth points in the same direction but is not statistically significant in Canada. In both countries, we also find support for the trust mechanism: Perceived financial improvement is associated with higher trust (Models 2 and 6), while trust is in turn associated with more tax tolerance (Models 3 and 7) (all significant at  $p < 0.01$ ). Once again, formal mediation analyses reveal that the mediation effect is statistically significant but substantively modest.

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<sup>3</sup> From 2004 to 2008, the CES asks, “Financially, are you better off, worse off, or about the same as a year ago?” whereas it asks “Over the past year, has your financial situation gotten better, gotten worse, or stayed about the same?” in 2011 and 2015. The question in the JGSS and the GSS is the same as the latter but writes years in plural.



**Table 3: Regression models predicting willingness to pay taxes in the Canada and Japan**

	Canada				Japan			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Tax	Trust	Tax	Tax	Tax	Trust	Tax	Tax
Income growth	0.002 (0.002)	-0.003 (0.002)	0.001 (0.002)	0.003 (0.002)				
“Same” financial situation (ref: “worse” situation)	0.136*** (0.010)	0.042*** (0.012)	0.124*** (0.012)	0.132*** (0.012)	0.063*** (0.009)	0.030*** (0.007)	0.062*** (0.009)	0.061*** (0.010)
“Better” financial situation (ref: “worse” situation)	0.139*** (0.013)	0.064*** (0.016)	0.124*** (0.016)	0.134*** (0.017)	0.059*** (0.017)	0.036*** (0.014)	0.068*** (0.019)	0.072*** (0.020)
Tertiary education	0.058*** (0.011)	0.155*** (0.012)	0.045*** (0.012)	0.050*** (0.019)	0.033*** (0.011)	0.056*** (0.008)	0.029** (0.011)	0.032** (0.015)
Trust			0.118*** (0.010)				0.079*** (0.015)	
Tertiary*income growth				-0.001 (0.004)				
Tertiary*“same” situation				0.011 (0.022)				0.008 (0.021)
Tertiary*“better” situation				0.014 (0.027)				-0.036 (0.036)
Income	0.006*** (0.002)	0.025*** (0.002)	0.004** (0.002)	0.006*** (0.002)	-0.006*** (0.001)	0.010*** (0.001)	-0.007*** (0.001)	-0.006*** (0.001)
Age	-0.011*** (0.002)	-0.002 (0.003)	-0.011*** (0.003)	-0.011*** (0.002)	-0.003 (0.002)	0.001 (0.001)	-0.003 (0.002)	-0.003 (0.002)
Age <sup>2</sup>	0.000*** (0.000)	0.000* (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	-0.000 (0.000)	0.000** (0.000)	0.000*** (0.000)
Female	0.013 (0.009)	0.002 (0.010)	0.020** (0.010)	0.013 (0.009)	-0.016* (0.009)	-0.007 (0.007)	-0.019** (0.009)	-0.015* (0.009)
Unemployed	0.011 (0.023)	-0.031 (0.027)	0.037 (0.028)	0.011 (0.023)	-0.020 (0.034)	0.006 (0.026)	-0.023 (0.036)	-0.020 (0.034)
Retired	0.030** (0.015)	0.018 (0.017)	0.027 (0.017)	0.030** (0.015)	-0.034** (0.017)	0.048*** (0.012)	-0.041** (0.018)	-0.034** (0.017)
Constant	0.655*** (0.053)	0.208*** (0.065)	0.635*** (0.064)	0.655*** (0.054)	0.262*** (0.047)	0.387*** (0.036)	0.224*** (0.049)	0.263*** (0.047)
Observations	14,158	10,280	10,280	14,158	10,719	9,427	9,427	10,719
R-squared	0.036	0.071	0.044	0.036	0.024	0.031	0.026	0.024

*Notes:* Linear probability models with robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year dummies included (not shown here).

Models 4 and 8 in Table 3 do not reveal significant interactions between education and economic changes. In Canada, perceived financial improvement has a positive association with tax preferences among both tertiary- and non-tertiary-educated respondents. In Japan, although the interaction in Model 8 is not significant, the marginal effect plot presented in Appendix 7 reveals that the effect of improvement to one’s financial situation tends to be stronger among the non-tertiary educated than among the tertiary educated. Finally, it is worth noting that the effect of

some control variables differs between the two countries: for example, income levels have a positive effect on tax preferences in Canada, but a negative one in Japan. This may explain why in Japan, parties representing low-income voters advocate for tax cuts.

We present several additional analyses in Appendices 6 and 7 for the Canadian and Japanese cases, respectively. First, as in the GSS survey, we find no correlation between support for redistribution and tax preferences in the CES and the JGSS. Second, the models are robust to the same robustness checks as those used for the US survey. Overall, the additional analysis of longitudinal Canadian and Japanese survey data lends additional support for all hypotheses except H4, the interaction between education and economic decline, for which we found no evidence in Canada and only weak evidence in Japan.

## **Conclusion**

We find the same pattern in three different surveys conducted in contrasting tax policy contexts: when individuals' subjective economic situation increases (decreases), they become more (less) tolerant of current tax levels. Support for taxation is thus very different from support for redistribution: the two variables are not correlated, and the latter tends to be more closely associated with the predictions of the Meltzer-Richard model based on self-interest, as support for redistribution decreases with income growth. Hence, researchers must reflect upon the nature of the dependent variable when they study the relationship between income and preferences: redistribution follows the self-interest hypothesis, whereas tax preferences confirm the luxury good hypothesis. As individuals become better-off, they are more willing to provide resources to finance policies that partly benefit themselves and partly benefit others since governments can increase taxes without reducing citizens' take-home pay.

Our findings suggest that subjective perceptions matter more for preferences than objective conditions. In fact, we find that the effect objective income growth on tax preference is driven by education. Not only is education itself a powerful determinant of policy preferences (Attewell 2021), but it also affects both income growth and tax policy preferences. However, it would be wrong to dismiss the impact of more proximate causes such as income growth and focus entirely

on education. Indeed, subjective economic changes are significantly related with tax preferences in panel and cross-sectional data even if we control for education.

Our study makes an important theoretical contribution and has major practical policy implications. Theoretically, it reveals the micro-foundations of Paul Pierson's "permanent austerity" argument (Pierson 2001). Governments could have increased tax revenues to alleviate the pressures of permanent austerity, but revenues have been stagnating in recent decades despite rising social policy costs. Tax competition, the main explanation for constraints on taxation, is not a satisfactory reason for not raising taxes: while tax competition reduces governments' capacity to tax corporations and capital, these taxes have never been the main revenue-generating tools used by governments. Instead, we argue that the "decline of taxability" in the current era is related to economic stagnation and the decline of income growth.

As inequality has been rising and the benefits of growth have become less widespread, the income of a large proportion of the population has stagnated or declined in the recent decades. The decline of income growth is particularly acute for individuals with lower levels of education, who are also the group whose tax preferences are the most affected by their financial situation. Moreover, economic decline is negatively correlated with social trust, an important precondition for tolerance of paying taxes. As such, the stagnation and decline of the income of substantial parts of the population, particularly among the non-tertiary educated, may help to explain the stagnation of tax revenues and the decline of taxability in advanced democracies.

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## Appendix - “Economic decline and tax policy preferences”

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### Appendix 1: Descriptive statistics of the final sample (GSS, United States)

#### Cross-sectional (1976-2018):

Variable	N	Mean	Std. Dev.	Min	Max
Willingness to pay taxes	28,222	0.36	0.48	0	1
Income growth	28,222	0.68	2.12	-10.36	9.67
Perceived change: same (ref: worse)	28,222	0.38	0.48	0	1
Perceived change: better (ref: worse)	28,222	0.40	0.49	0	1
Income decile	28,222	5.76	2.76	1	10
Tertiary education	28,222	0.24	0.42	0	1
Age	28,222	43.37	13.94	21	75
Female	28,222	0.52	0.50	0	1
Unemployed	28,222	0.04	0.18	0	1
Retired	28,222	0.08	0.27	0	1

#### Panel (2006-2014):

Variable	N	Mean	Std. Dev.	Min	Max
Willingness to pay taxes	7,666	0.45	0.50	0	1
Income growth	7,666	-1.18	2.13	-7.32	7.70
Perceived change: same (ref: worse)	7,666	0.37	0.48	0	1
Perceived change: better (ref: worse)	7,666	0.32	0.47	0	1
Income decile	7,666	5.55	2.84	1	10
Tertiary education	7,666	0.32	0.47	0	1
Age	7,666	46.42	14.18	21	75
Female	7,666	0.55	0.50	0	1
Unemployed	7,666	0.05	0.22	0	1
Retired	7,666	0.13	0.33	0	1

## Appendix 2: Robustness tests, GSS cross-sectional analysis

The following robustness tests concern the GSS (General Social Survey, United States) cross-sectional data analysis and replicate Model 1 in Table 1 of the main manuscript. Unless noted otherwise, year dummies are included. Unless noted otherwise, the table shows linear probability models with tax tolerance as the dependent variable and with robust standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table A2: Robustness tests – regression models of tax tolerance – GSS cross-sectional**

	A2.0	A2.1	A2.2	A2.3	A2.4	A2.5
Income growth	0.004 (0.003)	0.017 (0.014)	0.004 (0.003)		-0.000 (0.002)	0.004 (0.003)
“Same” financial situation (ref: “worse” situation)	0.062*** (0.010)	0.286*** (0.048)		0.062*** (0.010)	0.059*** (0.010)	0.062*** (0.010)
“Better” financial situation (ref: “worse” situation)	0.074*** (0.011)	0.342*** (0.050)		0.070*** (0.010)	0.070*** (0.011)	0.074*** (0.011)
Tertiary education	0.117*** (0.010)	0.525*** (0.044)	0.117*** (0.010)	0.110*** (0.009)	0.134*** (0.010)	0.114*** (0.010)
Income decile	-0.023*** (0.002)	-0.103*** (0.007)	-0.020*** (0.002)	-0.019*** (0.002)	-0.024*** (0.002)	-0.023*** (0.007)
Age	-0.014*** (0.002)	-0.062*** (0.009)	-0.015*** (0.002)	-0.015*** (0.001)	-0.015*** (0.002)	-0.014*** (0.002)
Age <sup>2</sup>	0.000*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Female	-0.045*** (0.008)	-0.205*** (0.035)	-0.047*** (0.008)	-0.050*** (0.007)	-0.043*** (0.008)	-0.045*** (0.008)
Unemployed	0.011 (0.023)	0.050 (0.100)	-0.005 (0.023)	0.002 (0.022)	0.024 (0.023)	0.009 (0.023)
Retired	0.017 (0.017)	0.070 (0.072)	0.015 (0.017)	0.018 (0.015)	0.021 (0.017)	0.019 (0.017)
Unemployment rate					-0.004 (0.003)	
Real GDP growth					-0.000 (0.002)	
Effective tax rate						0.347 (0.255)
Average benefits received						0.088 (0.055)
Constant	0.705*** (0.049)	0.941*** (0.216)	0.777*** (0.048)	0.717*** (0.037)	0.744*** (0.052)	0.647*** (0.055)
Observations	28,222	28,222	28,287	31,558	28,222	28,222
R <sup>2</sup> (overall)	0.048		0.045	0.049	0.034	0.049

A2.0: Original model (Table 1, Model 1)

A2.1: Logistic regression model

A2.2: Only including objective growth

A2.3: Only including perceived financial change

A2.4: Including two macro variables (GDP growth and unemployment rate) instead of year dummies

A2.5: Including effective taxes paid and average benefits received (in % of respondents' income)

**Table A2: Robustness tests – regression models of tax tolerance (continued)**

	A2.6	A2.7	A2.8	A2.9	A2.10
Income growth			0.004 (0.003)	0.016*** (0.003)	0.004 (0.003)
“Same” financial situation (ref: “worse” situation)	0.058*** (0.011)	0.062*** (0.010)	0.062*** (0.010)	0.062*** (0.010)	0.066*** (0.010)
“Better” financial situation (ref: “worse” situation)	0.081*** (0.011)	0.074*** (0.011)	0.074*** (0.011)	0.076*** (0.011)	0.077*** (0.011)
Tertiary education	0.122*** (0.011)	0.118*** (0.010)	0.117*** (0.010)		0.114*** (0.010)
Income decile	-0.023*** (0.002)	-0.023*** (0.002)	-0.022*** (0.002)	-0.017*** (0.002)	-0.025*** (0.002)
Age	-0.015*** (0.003)	-0.014*** (0.002)	-0.014*** (0.002)	-0.013*** (0.002)	-0.014*** (0.002)
Age <sup>2</sup>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Female	-0.050*** (0.008)	-0.046*** (0.008)	-0.046*** (0.008)	-0.048*** (0.008)	-0.045*** (0.008)
Unemployed	0.002 (0.025)	0.010 (0.023)	0.011 (0.023)	0.007 (0.023)	0.017 (0.023)
Retired	0.017 (0.018)	0.019 (0.017)	0.018 (0.017)	0.019 (0.017)	0.016 (0.017)
Republican party ID			-0.007*** (0.002)		
4-year income growth	0.004 (0.007)				
Income stability (categorical, ref: income decline)		-0.014 (0.011)			
Income growth (categorical, ref: income decline)		0.004 (0.014)			
Race: Black (ref: white)					-0.110*** (0.012)
Race: Other (ref: white)					-0.036** (0.018)
Constant	0.623*** (0.063)	0.713*** (0.050)	0.723*** (0.049)	0.649*** (0.049)	0.721*** (0.049)
Observations	24,104	28,222	28,133	28,222	28,222
R <sup>2</sup> (overall)	0.052	0.049	0.050	0.040	0.054

A2.6: Using 4-year income growth instead of annual income growth

A2.7: Using non-linear income growth (three equal-sized categorical groups: income growth, income stability/stagnation, income decline)

A2.8: Control for partisan identification

A2.9: Omitting education

A2.10: Including race

### Appendix 3: Robustness tests, GSS panel data analysis

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The following robustness test concerns the GSS (General Social Survey, United States) panel data analysis and replicates Model 1 in Table 2 of the main manuscript. Year dummies are included. The table shows linear probability models with tax tolerance as the dependent variable and cluster-robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table A3: Robustness tests – regression models of tax tolerance – GSS panel**

	<b>A3.0</b>	<b>A3.1</b>
Income growth <i>within</i> respondents	0.002 (0.005)	0.001 (0.004)
Income growth <i>between</i> respondents	-0.001 (0.006)	0.002 (0.006)
“Same” financial situation <i>within</i> (ref: “worse” situation)	0.029* (0.016)	0.035** (0.015)
“Same” financial situation <i>between</i> (ref: “worse” situation)	0.124*** (0.023)	0.126*** (0.023)
“Better” financial situation <i>within</i> (ref: “worse” situation)	0.031* (0.017)	0.038** (0.017)
“Better” financial situation <i>between</i> (ref: “worse” situation)	0.133*** (0.024)	0.132*** (0.024)
Tertiary education	0.129*** (0.018)	0.124*** (0.017)
Income decile	-0.022*** (0.003)	-0.022*** (0.003)
Age	-0.016*** (0.004)	-0.016*** (0.003)
Age <sup>2</sup>	0.000*** (0.000)	0.000*** (0.000)
Female	-0.043*** (0.014)	-0.048*** (0.014)
Unemployed	-0.001 (0.025)	-0.001 (0.023)
Retired	0.048** (0.022)	0.033 (0.022)
Constant	0.761*** (0.081)	0.765*** (0.078)
Observations	7,666	7,666

A3.0: Original model (Table 2, Model 1)

A3.1: Model including panel sampling weights.

## Appendix 4: Formal causal mediation analysis

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**Table A4: Causal mediation analysis: Does trust mediate the effect of perceived economic change (better vs. worse) on tax tolerance?**

<b>Mediating variable</b>	<b>ACME (Average Causal Mediation Effect)</b>	<b>Direct effect</b>	<b>Total effect</b>	<b>% of direct effect mediated</b>
Trust	<b>0.004</b> [0.002, 0.007]	<b>0.088</b> [0.067, 0.108]	<b>0.092</b> [0.072, 0.113]	<b>4.7%</b> [3.9%, 6.1%]

*Notes:* Estimates with 95% confidence intervals in brackets, significant results in bold. Mediation effects estimated with “medeff” function in Stata (Hicks and Tingley 2011).

## Appendix 5: Descriptive statistics of the final sample (CES, Canada and JGSS, Japan)

### Canadian Election Study (2004-2015):

Variable	N	Mean	Std. Dev.	Min	Max
Willingness to pay taxes	14,158	0.56	0.50	0	1
Income growth	14,158	-0.03	3.06	-10.97	8.92
Perceived change: same (ref: worse)	14,158	0.53	0.50	0	1
Perceived change: better (ref: worse)	14,158	0.19	0.39	0	1
Tertiary education	14,158	0.35	0.48	0	1
Income decile	14,158	6.10	3.10	1	10
Age	14,158	49.05	13.97	21	75
Female	14,158	0.50	0.50	0	1
Unemployed	14,158	0.04	0.19	0	1
Retired	14,158	0.20	0.40	0	1

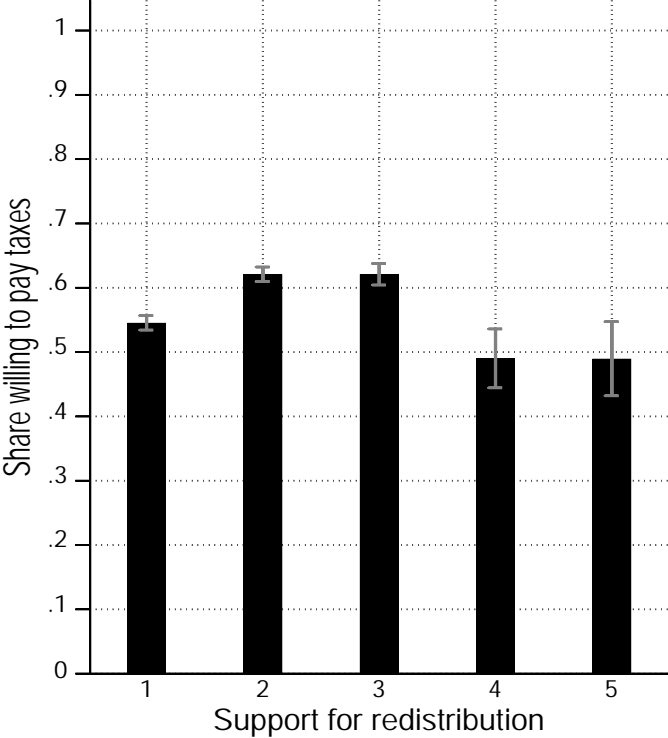
### Japanese General Social Survey (2000-2012):

Variable	N	Mean	Std. Dev.	Min	Max
Willingness to pay taxes	10,719	0.22	0.41	0	1
Income growth	missing				
Perceived change: same (ref: worse)	10,719	0.46	0.50	0	1
Perceived change: better (ref: worse)	10,719	0.08	0.27	0	1
Tertiary education	10,719	0.24	0.43	0	1
Income decile	10,719	10.12	3.29	1	19
Age	10,719	49.90	15.73	20	89
Female	10,719	0.41	0.49	0	1
Unemployed	10,719	0.01	0.12	0	1
Retired	10,719	0.09	0.28	0	1

**Appendix 6: Robustness tests (CES, Canada)**

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**Figure A6a: Correlation between support for redistribution and tax tolerance (CES, Canada)**





The following robustness tests replicate Model 1 in Table 3 of the main manuscript. Unless noted otherwise, year dummies are included. Unless noted otherwise, the table shows linear probability models with tax tolerance as the dependent variable and with robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table A6: Robustness tests CES, Canada – regression models of tax tolerance**

	<b>A6.0</b>	<b>A6.1</b>	<b>A6.2</b>	<b>A6.3</b>	<b>A6.4</b>
Income growth	0.002 (0.002)	0.009 (0.008)	0.002 (0.002)		0.003 (0.002)
“Same” financial situation (ref: “worse” situation)	0.136*** (0.010)	0.555*** (0.043)		0.135*** (0.010)	0.136*** (0.010)
“Better” financial situation (ref: “worse” situation)	0.139*** (0.013)	0.571*** (0.056)		0.137*** (0.013)	0.139*** (0.013)
Tertiary education	0.058*** (0.011)	0.247*** (0.045)	0.060*** (0.011)	0.060*** (0.009)	0.056*** (0.011)
Income decile	0.006*** (0.002)	0.025*** (0.006)	0.009*** (0.002)	0.006*** (0.001)	0.007*** (0.002)
Age	-0.011*** (0.002)	-0.048*** (0.010)	-0.014*** (0.002)	-0.009*** (0.002)	-0.011*** (0.002)
Age <sup>2</sup>	0.000*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Female	0.013 (0.009)	0.054 (0.037)	0.008 (0.009)	0.009 (0.008)	0.013 (0.009)
Unemployed	0.011 (0.023)	0.048 (0.094)	-0.027 (0.023)	0.007 (0.022)	0.012 (0.023)
Retired	0.030** (0.015)	0.124* (0.064)	0.032** (0.015)	0.039*** (0.014)	0.032** (0.015)
Unemployment rate					-0.060*** (0.012)
Real GDP growth					0.032*** (0.005)
Effective tax rate	0.655*** (0.053)	0.666*** (0.226)	0.797*** (0.052)	0.622*** (0.038)	0.978*** (0.095)
Average benefits received					
Constant	14,158 0.036 0.002 (0.002)	14,158 0.009 (0.008)	14,211 0.021 0.002 (0.002)	15,390 0.035	14,158 0.034 0.003 (0.002)
Observations	0.136***	0.555***		0.135***	0.136***
R <sup>2</sup> (overall)	(0.010)	(0.043)		(0.010)	(0.010)

A6.0: Original model (Table 3, Model 1)

A6.1: Logistic regression model

A6.2: Only including objective growth

A6.3: Only including perceived financial change

A6.4: Including two macro variables (GDP growth and unemployment rate) instead of year dummies

**Table A6: Robustness tests CES, Canada – regression models of tax tolerance (continued)**

	<b>A6.5</b>	<b>A6.6</b>	<b>A6.7</b>
Income growth		0.003*	0.007***
		(0.002)	(0.002)
“Same” financial situation (ref: “worse” situation)	0.134***	0.139***	0.136***
	(0.010)	(0.012)	(0.010)
“Better” financial situation (ref: “worse” situation)	0.143***	0.145***	0.141***
	(0.014)	(0.016)	(0.013)
Tertiary education	0.066***	0.056***	
	(0.010)	(0.012)	
Income decile	0.006***	0.008***	0.008***
	(0.002)	(0.002)	(0.002)
Age	-0.013***	-0.012***	-0.010***
	(0.003)	(0.003)	(0.002)
Age <sup>2</sup>	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Female	0.015*	0.022**	0.011
	(0.009)	(0.010)	(0.009)
Unemployed	0.006	0.002	0.010
	(0.023)	(0.027)	(0.023)
Retired	0.029*	0.021	0.031**
	(0.015)	(0.017)	(0.015)
Republican party ID		-0.018***	
		(0.004)	
4-year income growth	-0.004		
	(0.006)		
Constant	0.691***	0.698***	0.636***
	(0.063)	(0.063)	(0.053)
Observations	13,776	10,510	14,158
R <sup>2</sup> (overall)	0.035	0.041	0.034

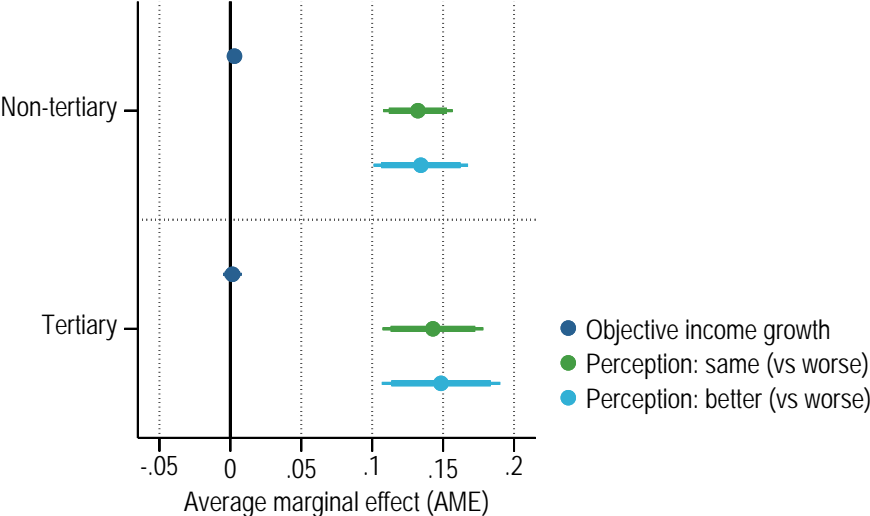
A6.5: Including 4-year income growth instead of annual income growth

A6.6: Control for partisan identification

A6.7: Omitting education

Figure A6b presents the marginal effects of the interaction between education and objective and subjective income growth for Canada, based on Model 4 in Table 3.

**Figure A6b: The conditional impact of education (CES, Canada)**

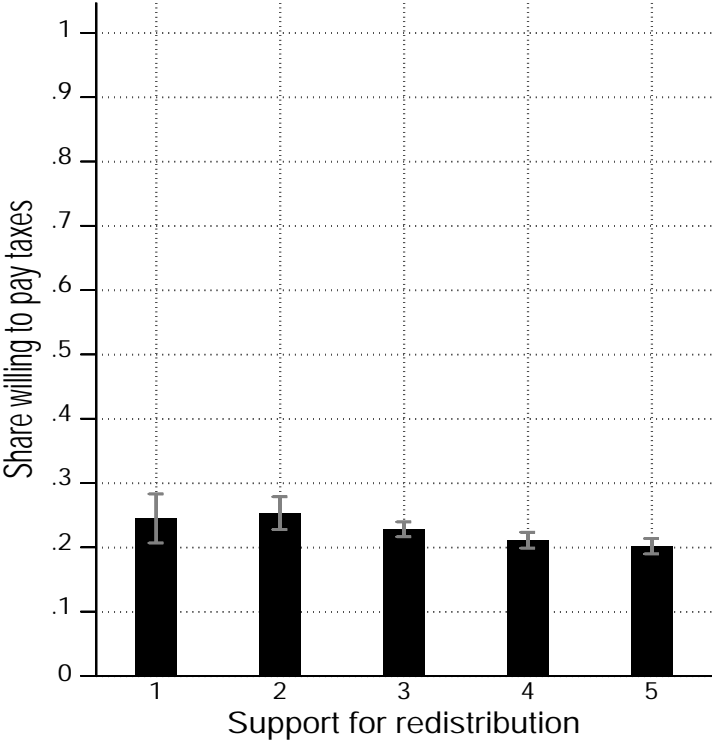


*Note:* Average marginal effects with 90 and 95% confidence intervals, calculated from Model 4 in Table 3.

**Appendix 7: Robustness tests (JGSS, Japan)**

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**Figure A7a: Correlation between support for redistribution and tax tolerance (JGSS, Japan)**



The following robustness tests replicate Model 5 in Table 3 of the main manuscript. Unless noted otherwise, year dummies are included. Unless noted otherwise, the table shows linear probability models with tax tolerance as the dependent variable and with robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table A7: Robustness tests JGSS, Japan – regression models of tax tolerance**

	A7.0	A7.1	A7.2	A7.3	A7.4
Income growth					
“Same” financial situation (ref: “worse” situation)	0.063*** (0.009)	0.379*** (0.052)	0.062*** (0.009)	0.060*** (0.009)	0.065*** (0.009)
“Better” financial situation (ref: “worse” situation)	0.059*** (0.017)	0.363*** (0.101)	0.057*** (0.017)	0.058*** (0.017)	0.063*** (0.017)
Tertiary education	0.033*** (0.011)	0.197*** (0.063)	0.037*** (0.011)	0.035*** (0.011)	
Income decile	-0.006*** (0.001)	-0.034*** (0.008)	-0.006*** (0.001)	-0.006*** (0.001)	-0.005*** (0.001)
Age	-0.003 (0.002)	-0.012 (0.011)	-0.003 (0.002)	-0.003 (0.002)	-0.003* (0.002)
Age <sup>2</sup>	0.000*** (0.000)	0.000** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Female	-0.016* (0.009)	-0.098* (0.052)	-0.014* (0.009)	-0.015* (0.009)	-0.022*** (0.008)
Unemployed	-0.020 (0.034)	-0.131 (0.223)	-0.017 (0.035)	-0.017 (0.036)	-0.020 (0.034)
Retired	-0.034** (0.017)	-0.188** (0.089)	-0.035** (0.017)	-0.037** (0.017)	-0.034** (0.017)
Unemployment rate			-0.010 (0.009)		
Real GDP growth			0.013*** (0.003)		
Partisan ID				-0.021*** (0.005)	
Constant	0.262*** (0.047)	-1.140*** (0.274)	0.277*** (0.062)	0.330*** (0.049)	0.272*** (0.047)
Observations	10,719	10,719	10,719	10,577	10,752
R <sup>2</sup> (overall)	0.024		0.019	0.027	0.023

A7.0: Original model (Table 3, Model 5)

A7.1: Logistic regression model

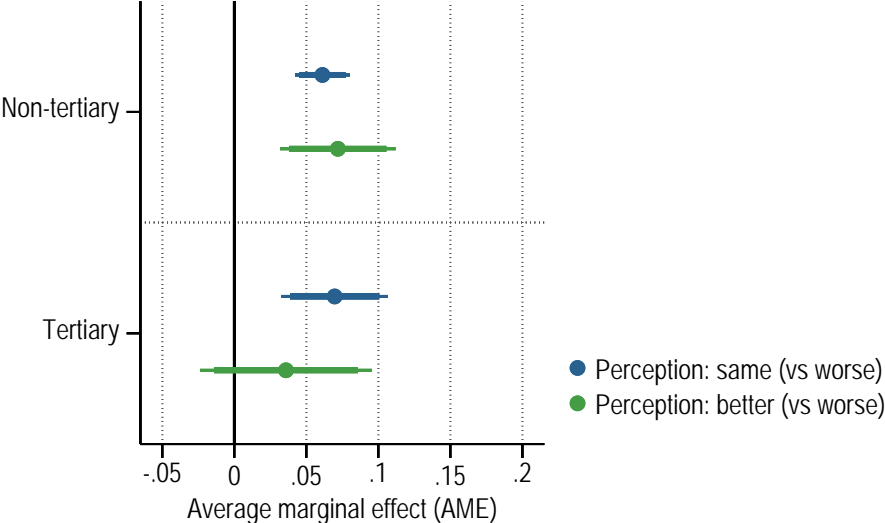
A7.2: Including two macro variables (GDP growth and unemployment rate) instead of year dummies

A7.3: Control for partisan identification

A7.4: Omitting education

Figure A7b presents the marginal effects of the interaction between education and objective and subjective income growth for Japan, based on Model 8 in Table 3.

**Figure A7b: The conditional impact of education (JGSS, Japan)**



*Note:* Average marginal effects with 90 and 95% confidence intervals, calculated from Model 8 in Table 3.