



# Public support for tax policies in COVID-19 times: evidence from Luxembourg

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## Abstract

We study attitudes towards the introduction of hypothetical new taxes to finance the cost of the COVID-19 pandemic. We rely on survey data collected in Luxembourg in 2020. The survey asks for the agreement of respondents over: a one-time net wealth tax, an inheritance tax, a temporary solidarity income tax, and a temporary increase in VAT. All questions include different and randomly assigned tax attributes (tax rates and exemption amounts). We find a clear divide with relatively high support for new wealth and inheritance taxes on the one hand and a low support for increases in VAT and income taxes on the other hand. While 58% of respondents agree or strongly agree with a one-time tax levied on net worth, only 24% are in favor of a small increase in VAT. Support for any tax is however negatively associated with the size of the tax as measured by the predicted revenues. Our results indicate that a one-time wealth tax could raise substantial revenues and still garner public support.

**Keywords** COVID-19 · Wealth tax · Inheritance tax · Income tax · VAT · Preferences for redistribution

**JEL Classification** H2 · D31 · E62 · I38

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## 1 Introduction

Governments around the globe have taken unprecedented fiscal measures to cope with the economic effects of the COVID-19 pandemic, shifting massive resources towards the health and social security systems, cutting on taxes and contributions, providing direct financial help for the most vulnerable and giving or backing large amount of credit to keep businesses running (Alberola et al., 2020; IMF, 2020b; OECD, 2020; Eurofound, 2020).

The introduction of temporary taxes levied on wealth stands up as one of the solutions suggested to finance the extraordinary costs of the pandemic. For example, Piketty (2020) mentions that, after the second world war, exceptional taxes were charged on the richer to pay the public debt and could similarly be advocated. Landais et al. (2020) also take inspiration in the post-war experience (particularly in Germany) and propose the introduction of a progressive and temporary wealth tax, which should be European-wide and applied to the net worth of the top 1% richest persons. The International Monetary Fund (IMF) has proposed financing the pandemic costs by applying progressive taxes on the better-off individuals and on those who were less affected by the crisis, including higher taxes on higher income brackets, exclusive property, capital gains, and wealth (IMF, 2020b), and even a ‘solidarity surcharge’ (IMF, 2020a), as well as changing corporate taxation to tax firms according to their profitability. The United Kingdom established in 2020 the Wealth Tax Commission to assess proposals for a national wealth tax (Advani et al., 2020; Rowlingson et al., 2021). In the United States, leading politicians had already proposed wealth taxes as part of the larger and ongoing debate on how to tackle rising economic inequality (Scheuer & Slemrod, 2021). Moreover, recent literature has highlighted that wealth and inheritance taxes may reduce the inequality equilibrium for the next generation (IMF, 2017; Cowell et al., 2019; Berg & Hebous, 2021)).

The goal of these proposals is to find alternative revenues to face increasing expenditures in areas like health and social care, and to ease fiscal deficits. However, a key element for the success of the introduction of any new taxes (or the increase in existing taxes) is the support it can garner among the public. Without political feasibility, government tax proposals may fail, particularly in the extraordinary circumstances of the pandemic crisis, with some people and economic sectors much more affected than others. As recently put by the IMF report *A Fair Shot* (IMF, 2021), the rise of taxes and reallocation of spending will “require dialogue with society at large to ensure that policies are aligned with people’s preferences. Understanding these preferences, which have likely been affected by the COVID-19 crisis, will be crucial.”

Building on this premise, this paper studies public support for wealth taxes relative to other tax policies in the context of the pandemic. We draw upon an online survey run between May and July 2020 in Luxembourg in which participants were invited to express their views about the introduction of new hypothetical personal taxes to cover the anticipated costs arising from the pandemic. The originality of the questionnaire was two-fold. First, respondents were asked about four different *types* of taxes: a one-time wealth tax, a permanent inheritance tax,

a temporary increase in income taxes, and a temporary increase in value-added taxes. Second, some key parameters of the different schedules—tax rates, exemption amounts and duration of the tax—were randomized across respondents. We are therefore able to examine (i) the general support for increased taxation in the face of the pandemic, (ii) preferences over different types of tax instruments, and (iii) preferences over different tax parameters (and notably the overall amount collected).

The pandemic situation in Luxembourg and the immediate policy responses were not very different from those observed in other European countries. The first official case of COVID-19 was diagnosed on February 29, 2020. A strict lockdown was enforced on March 16, and on March 17, the government declared a state of emergency. Stay-at-home orders were enforced, including the closure of schools, child-care centres, non-essential shops and services, and construction sites. A phase of gradual re-opening started from April 20 and culminated with elementary schools re-opening from May 25, while restaurants were allowed to re-open on May 27—at about the time our survey was fielded. The state of emergency officially terminated on June 25. Alongside the setting up of sanitary infrastructure (notably testing centers), a broad package of economic measures were taken by the government to provide support to impacted enterprises, self-employed and salaried workers (most notably with a comparatively generous short-time hours payment scheme for furloughed workers). The total cost of economic and sanitary measures for the State was announced on April 29 2020 to reach 10,4 EUR billion or 17.5% of GDP—a number not very different from an EU average of 19% of GDP (Government of Luxembourg, Ministry of Finance, 2020). While Luxembourg was facing the pandemic from a favourable economic and budgetary position, it was widely expected at that point that the crisis would have significant negative consequences for the economy and for public finances—with a forecast contraction of GDP of about 6% and a projected negative government balance of 8.5% of GDP for 2020 (Government of Luxembourg, Ministry of Finance, 2020). By May-June 2020, however, SARS-CoV-2 infection rates had been declining rapidly, and there was little expectation of a second wave in the Fall of the magnitude that was later revealed. As of April 29, budgetary projections for 2021 were expected to “improve significantly compared to 2020 (...) explained by the simple fact that the COVID-19 related measures and their budgetary cost will almost have completely faded in 2021” (Government of Luxembourg, Ministry of Finance, 2020, p. 19).

In that context, our results show a clear divide with support for new wealth and inheritance taxes on the one hand and low support for increases in existing VAT and income taxes on the other hand. Regardless of the specific tax attributes shown to the respondents, we observe that 58% agreed or strongly agreed with a one-time tax levied on net worth, but only 24% were in favor of a small increase in VAT. For the wealth and inheritance taxes, the scenarios involving lower exemption amounts and higher marginal tax rates were less popular. Yet, substantial support remained. For example, 75% and 52% of respondents were in favour (agreed or strongly agreed) of a 0.5% or 2.0% tax rate, respectively, levied on net wealth in excess of EUR 4 million; but the support fell to 38% when the tax rate is 2% and the exception amount is EUR 2 million.

These findings contribute to the literature investigating preferences for redistribution (e.g., Alesina & Giuliano, 2011; Andreoli & Olivera, 2020; Olivera, 2015), particularly to the studies assessing attitudes to tax policy (Stantcheva, 2020; Rowlingson et al., 2021) and feasibility of wealth taxation (Saez & Zucman, 2019; Scheuer & Slemrod, 2021). Closest to our study is the report by Rowlingson et al. (2021) measuring attitudes towards the introduction of a wealth tax in the United Kingdom. The authors find that among five different types of taxes, 41% of respondents indicated a wealth tax as their preferred option, while 75% of individuals support this tax either as first, second or third option in the United Kingdom. WID (2021) reports opinion polls showing support of similar magnitude for a wealth tax in the USA (64%), Canada (79%) and France (76%). People from Latin American countries—a region badly hit by the COVID-19 pandemic—also revealed support for introducing a tax on large wealth: public opinion surveys fielded along 2020 in Argentina, Bolivia, Chile, Ecuador, Mexico and Peru show that between 64% and 76% of citizens support the implementation of special taxes on large wealth (CELAG, 2020).<sup>1</sup> Recent studies similar to ours also used survey data to assess public attitudes towards redistributive policies in the aftermath of the pandemic. Klemm and Mauro (2021) find that in the United States, people most affected by the pandemic (serious illness or job loss) or who personally know someone who was, express relatively more favourable views for temporary or structural progressive taxation. Balasundharam and Dabla-Norris (2021) used opinion surveys of eleven advanced and emerging market economies and find that the support for redistributive policies depends on personal experiences, views about the poor, and whether there is a favourable perception of government responses. As we discuss below, it is difficult to compare estimates of support for taxation across studies and contexts, but our findings appear consistent with the existing literature. They show that the public can support increased taxation—notably wealth taxation—at least in the context of the extraordinary circumstances of the pandemic, but they also highlight the important variations by tax type and the importance of the size of the tax proposals.

The paper is organized as follows. Section 2 presents our survey data. Section 3 describes the methods. Section 4 provides regression results and discusses their implications for potential policy implementation. Section 5 concludes.

## 2 Data

Our analysis draws upon the first wave of the COVID-19 Socio-Economic Impact (SEI) survey run in Luxembourg in 2020 (Dijst et al., 2021). The SEI survey was a multi-topic online opt-in survey aimed at capturing the experience of the Luxembourg population in the initial phase of the pandemic. Respondents were invited to participate through a nationwide communication campaign launched in social media and in the press by academic institutions and research-funding agencies of Luxembourg. The survey targeted residents of Luxembourg aged 16 and above as well as

<sup>1</sup> In December 2020, Argentina implemented a one-off wealth tax, while Bolivia set up a permanent wealth tax. Both countries have already collected revenues for this new tax.

people working or studying in Luxembourg but residing outside of the country. The first wave of the survey ran between May 27 and July 5 2020.

The survey covered multiple topics. After a core set of socio-demographic questions, participants were randomly assigned to one or two of four modules, covering either (i) employment and living conditions, (ii) mobility, health or (iii) time use and interactions in the household (see Dijkstra et al., 2021). Out of an initial number of 7297 ‘hits’ on the survey web-page, the survey recorded 4118 entries. Filtering out entries tagged as implausible, incomplete or untrustworthy led to a sample of 3304 usable entries (see Van Acker & Van Kerm, 2021, for details). For the present analysis we retained therefrom the 2528 entries from respondents residing in Luxembourg (and therefore potentially impacted by all types of tax policies discussed) and selected the 802 entries that were randomized to answer the module on “employment and living conditions” in which questions about attitudes towards taxation were included.

As a non-probability sample, no element of the design can guarantee representativity of the survey and we observed, among the usable entries, an over-representation of women, of the highly educated, of people employed, and of individuals between 35 and 50 year old. A set of calibration weights were therefore constructed to match (i) the (joint) distribution of age, gender, education and activity status observed in the 2018 European Union Statistics on Income and Living Conditions (EU-SILC) and (ii) Luxembourg population counts by age and gender as of November 2019 (Van Acker & Van Kerm, 2021). Table B-1 in Online Appendix B describes the sample characteristics with and without application of calibration weights.

As part of the module on “employment and living conditions”, participants were asked about their attitudes towards the introduction of new taxes. The framing for these questions was about how acceptable is raising taxes to collect revenues to finance measures supporting the economy and protecting households who have faced income losses. The survey asked for opinions about (i) a one-time net wealth tax, (ii) an inheritance tax, (iii) a temporary solidarity tax on labour income, and (iv) a temporary increase in VAT. This took the form of a 5-level Likert scale with respondents indicating whether they “strongly disagree”, “disagree”, “neither agree nor disagree”, “agree” or “strongly agree” with the proposed tax schemes.<sup>2</sup>

Key parameters of each of the proposed tax types were made explicit, but the value of the parameters were randomized across respondents. Thus, all participants were invited to express their opinion about four different tax proposals but different participants were shown taxes with different parameters. For the wealth tax, these are eight combinations of marginal rates of 0.5%, 1.0%, 1.5% or 2.0% applied to net worth in excess of 2 or 4 million euros. The inheritance tax included 9 scenarios formed by the combination of marginal rates 5.0%, 7.5% or 10.0% applied to inheritances in excess of 1, 2 or 5 million euros. The labour income tax included 9 scenarios formed by the combination of tax rates 1.0%, 2.0% or 3.0% levied during 1, 2 or 3 years. The increase of the VAT (currently at 17%) included 9 scenarios formed by the combination of increases of 0.25, 0.5 or 1.0 percentage points levied during

<sup>2</sup> Online Appendix A describes the overall framing and the exact formulation of the core questions used in the analysis.

**Table 1** Expected revenues in 2021 under each hypothetical tax policy (EUR millions)

Wealth tax	Exemption tax rate	0.50%	1.00%	1.50%	2.00%
	2 million	574	1147	1721	2295
	4 million	357	714	1,072	1,429
Inheritance tax	Exemption tax rate	5.00%	7.50%	10.00%	
	1 million	83	125	167	
	2 million	52	79	105	
Labour income tax	Duration tax rate	1.00%	2.00%	3.00%	
	1 year	300	599	899	
	5 million	35	52	70	
VAT	Duration tax rate	0.25%	0.50%	1.00%	
	1 year	61	122	244	

See Online Appendix C for details on the calculation of expected revenues

1, 2 or 3 years. Figure B-1 in Online Appendix B describes the resulting number of cases for each of these treatment arms.

The tax proposals would lead to widely varying revenues. To put the numbers in context, Table 1 shows back-of-the-envelope calculations of the amount of potential revenues that the different tax schedules shown to survey participants could approximately collect in 2021 (calculations are detailed in Online Appendix C). The policy delivering the highest revenues is the introduction of a 2% tax applied to net worth in excess of 2 EUR million. By implementing this policy, the government could collect about 2,295 EUR million (3.6% of GDP), although this tax would only exist for one year.<sup>3</sup> If the exemption amount and tax rate were 4 EUR millions and 2%, the government could raise 1,429 EUR millions (2.3% of GDP). According to the Eurozone Household Finance and Consumption Survey (HFCS) 2018, about 9% of households hold net worth larger than 2 EUR millions, and about 2.7% have net worth larger than 4 EUR millions (the median and mean were EUR 498,500 and EUR 897,900). Even a less stringent wealth tax policy can produce substantial revenues. For example, a mere tax rate of 0.5% may raise 574 or 357 EUR millions if applied to net worth in excess of 2 or 4 EUR millions, respectively. These simple back-of-the-envelope calculations disregard any potential behavioural response and corresponding changes in the tax base.<sup>4</sup>

Note that Luxembourg currently has no wealth taxes for individuals. Inheritances are not taxed for direct line heirs, i.e. between parents, grandparents, children, and spouses.<sup>5</sup> Other relationships between donors and heirs are taxed at different rates and are increasing in the amount of the inheritance. Inheritance tax revenues are therefore low—115 EUR millions in 2019, representing about 0.5% of total tax

<sup>3</sup> We use data about GDP forecast in Luxembourg from European Commission (2020).

<sup>4</sup> Some of the behavioural responses due to changes in wealth taxes are, for example, moving residence (Agrawal et al., 2020; Alstadsaeter et al., 2019) and avoidance and evasion (Seim, 2017; Brülhart et al., 2022; Londono-Vélez & Ávila-Mahecha, 2021).

<sup>5</sup> However, a tax is levied on the portion of the estate that deviates—at the will of the donor—from the legal inheritance shares corresponding to the heirs.

revenues or 0.18% of GDP. Taxes on wage and salaries collected in 2019 amounted to 4,146 EUR millions, while VAT revenues were 3,872 EUR millions, representing 16.6% and 15.5% of total tax revenues (or 6.5% and 6.1% of GDP) respectively.

Most of the other variables used in the analysis are self-explanatory. The survey asked respondents to indicate their total monthly household net income by showing seven possible income brackets. To derive a measure of per capita household income, we assigned to these categories the corresponding median income within each bracket obtained from the Luxembourg's EU-SILC survey carried out in 2018. We then divided income values by the number of reported household members. The variable *Luxembourgish* indicates that this is the most common language spoken at home. Note that 48% of residents in Luxembourg are foreigners and few would primarily speak Luxembourgish at home. The variable for lower education indicates primary or lower secondary education, while the variable for higher education indicates any level of tertiary education.

As Klemm and Mauro (2021) found in a survey of US residents that people who have experienced economic hardship due to the COVID-19 pandemic have relatively more favourable views about implementing temporary progressive taxes or structural progressive tax reforms, we include in the analysis a variable for *financial difficulties*. This is a composite index generated from five questions capturing self-assessed financial difficulties and hardship caused by the outbreak of COVID-19.<sup>6</sup> In some specifications, we also control for respondents degree of 'concern' about several social and economic dimensions because of the pandemic. Respondents were asked about how concerned they have recently been about various issues on a 1–5 Likert scale (from not at all concerned to extremely concerned). Among these dimensions, we consider concerns about the "economy in general", "social cohesion" and the "evolution of share prices and other forms of investments" (see Online Appendix A for the exact formulation). For all these dimensions, we compute a dummy variable taking value 1 if the respondent expressed being extremely concerned, and taking value 0 otherwise.

Table B-1 in Online Appendix B reports descriptive statistics of all the variables used in the analysis.

### 3 Methods

With tax parameters randomized in four hypothetical tax scenarios, our data structure is similar to that of a factorial survey experiment (see, e.g., Auspurg & Hinz, 2014). Accordingly, to assess support for different types of taxes, we estimated three regression models. In the first model, we stacked answers to the four tax questions

<sup>6</sup> The index is computed with a PCA's first component of the following questions: How well would you say you are managing financially these days? (1–5 scale); In 2020, do you expect to save any of your income regularly?; Since the beginning of the COVID-19 lock-down, have you ever been unable to pay your rent or mortgage?; Since the beginning of the COVID-19 lock-down, have you ever been unable to pay your bills on time?; During the COVID-19 lock-down, did you cancel or postpone any purchase of durable goods (e.g. car, house, computer, etc.)? The index is re-scaled to range from 0 to 1; the larger the index is, the more financial difficulties the individual experienced.

that were asked to participants and estimated a random effects probit regression of the form:

$$\Pr [y_{ij} > 3 | Z_i, T_j, R_{ij}] = \Phi(\alpha + \alpha_i + Z_i\beta + T_j\gamma + \delta R_{ij}) \quad (1)$$

where  $y_{ij}$  is the support of respondent  $i$  for tax type  $j$  as reported on the 5-points Likert scale ( $y_{ij} > 3$  implies that the individual “agrees” or “strongly agrees” with the proposed tax),  $\Phi$  is the normal cumulative distribution function,  $Z_i$  is a vector of respondent characteristics,  $\alpha_i \sim N(0, \sigma_\alpha)$  is a normally distributed individual-specific random effect (reflecting the respondent’s propensity to support taxes generally, irrespective of its type),  $T_j$  is a vector of three dummy variables for tax types (wealth tax, inheritance tax or income tax, with VAT tax omitted as reference type) capturing differential support for distinct types of taxes, and  $R_{ij}$  represents the expected tax revenues given the parameters of the type  $j$  tax presented to respondent  $i$  which captures how much the total tax burden influences support for the tax (as shown in Table 1). Recall that each respondent is randomly presented with one of alternative scenarios for each tax type with variations on the tax rate, the exemption amount and/or the duration of the tax. We adopt a random effects specification since there is no gain to using a fixed effects specification here: first, all variables in  $Z_i$  are invariant across tax type and their impact therefore would not be separately identified from the fixed-effect in a “within” transformation model, and, second, the values of  $R_{ij}$  are randomized across respondents and therefore independent by design on any respondent characteristic (observed or unobserved), therefore amenable to random effects assumption. The individual covariates included in  $Z_i$  are age, sex, marital status, education, employment status, household per capita income, home ownership status, speaking Luxembourgish and weekly time dummies.

In a second specification, we allow total revenues and individual covariates to have different effects on different types of taxes. In particular, we want to capture whether the elasticity of support towards taxation with respect to the tax burden varies across tax types. We are also seeking to capture preference heterogeneity across tax types along individual characteristics. To do so, we estimate separate regression equations for each of the four tax types of the form:

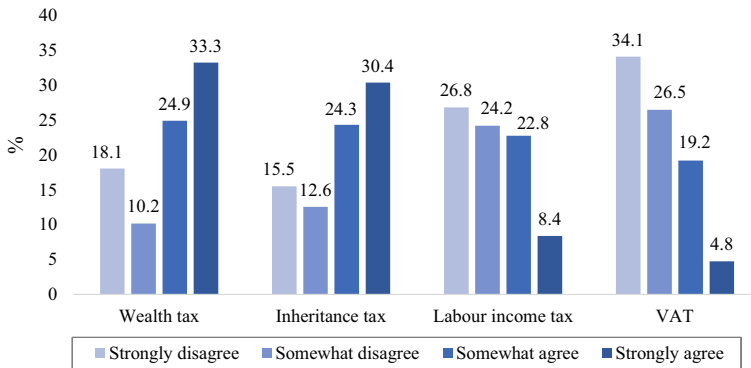
$$\Pr [y_{ij} > 3 | Z_i, T_j, R_{ij}] = \Phi(\alpha_j + Z_i\beta_j + \delta_j R_{ij}) \quad (2)$$

For completeness, the third specification is similar to specification (2) but includes dummy variables for each possible combinations of tax type and parameters ( $P_{ij}$ ):

$$\Pr [y_{ij} > 3 | Z_i, T_j, P_{ij}] = \Phi(\alpha_j + Z_i\beta_j + P_{ij}\gamma_j). \quad (3)$$

As sensitivity analysis, we also estimated linear models using the original Likert scale of 1–5 points as the dependent variable, and in a subsample obtained by removing individuals answering the neutral category “neither agree nor disagree”.





**Fig. 1** Support for hypothetical new or increases in personal taxes by tax type. *Notes:* The graph does not plot the category “Neither agree nor disagree”, which is roughly chosen by 13% to 17% of individuals. Pooled answers to tax questions with different parameters. The figures are unconditional statistics and use calibration weights

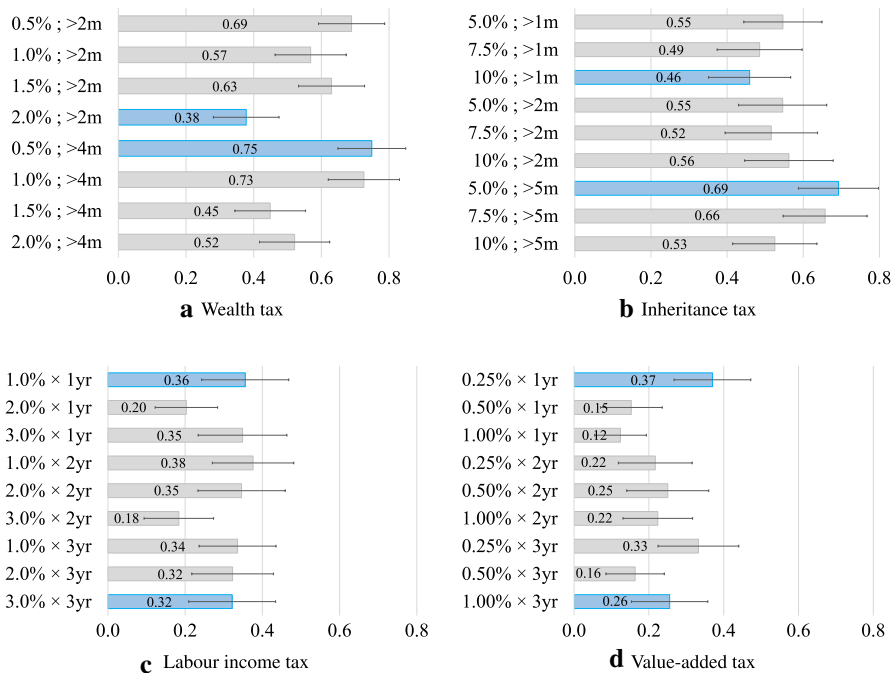
## 4 Results

### 4.1 Descriptive statistics

Figure 1 reports the overall support for each tax policy regardless of the specific attributes of the policy. To facilitate comparisons, the figure does not plot the category “neither agree nor disagree”, which is chosen by about 13–17% of the respondents for each policy.

There is a clear divide between, on the one hand, supporting a one-time wealth tax (58.2% agree or strongly agree and 28.3% disagree or strongly disagree) and an inheritance tax (54.7% vs 28.1%), and on the other hand, not supporting an increase neither in income taxes (51% disagree or strongly disagree and 31.2% agree or strongly agree) nor in VAT (70.6% vs 24.0%).

Figure 2 reports the support for each policy tax separately by tax parameters. The bars shown with a darker colour indicate the policy scenarios that could potentially raise the highest and lowest revenues. For example, the scenario for the wealth tax (in the upper left panel) reporting most revenues is the one involving a 2% tax rate applied to net worth in excess of 2 EUR million, while the scenario delivering the lowest revenues is the one involving a 0.5% tax rate applied to net worth in excess of 4 EUR million. For inheritance taxation, the corresponding scenarios are a rate of 10% and 5% tax rate applied to inheritances in excess of 1 and 5 EUR millions, respectively. For the other tax policies, the scenarios producing the highest and lowest revenues are evident. We observe that differences in the support between extreme tax scenarios are significant for wealth and inheritance taxation, but not for the other types of taxes. Although these differences are just based on unconditional proportions (and are not necessarily statistically significant), patterns emerge in the support for tax policies to finance the COVID-19 crisis. Within each tax type, tax parameters leading to the smallest revenues—that is, to the lightest aggregate burden—generally obtain the largest support (the income tax case is the only exception where the smallest revenue scenario comes



**Fig. 2** Support for hypothetical new or increases in personal taxes by tax type and scenario. *Notes:* The graphs plot the share of individuals who answer 'Strongly agree' or 'Agree' in each type of tax policy. The tax policies have specific attributes (tax rate, exemption amount and duration) that were randomized among the respondents. The confidence intervals use 95% confidence level. The bars in darker colour indicate the tax policies that potentially could raise the highest and lowest revenues. The figures are unconditional statistics and use calibration weights

close second). Similarly, tax parameters leading to the highest revenues receive lowest support in wealth and inheritance taxes. The patterns identified in Fig. 1 across tax types persist here: the scenario garnering the least support in inheritance taxation (46%) or in wealth taxation (38%) still has more support than any of the income tax or value-added tax scenarios. Differences in support for wealth tax and inheritance tax are not so clear cut and depend on the tax parameters—and similarly for differences between support for income and value-added tax.

### 4.2 Regression analysis

The first column of Table 2 reports parameter estimates for the model presented in Eq. 1. For ease of interpretation, the table shows marginal effects evaluated at covariate means. The first column reports these marginal effects for the model with the dependent variable that takes value 1 if the individual answers strongly agree or somewhat agree, and it takes value 0 otherwise. As a matter of sensitivity analysis to the definition of the dependent variable, the second column reports the marginal effects of the probit regression model when we remove the individuals who

**Table 2** Regression estimation of public support for tax policy (Model 1)

Variable	(1) Policy support 0/1		(2) Policy support 0/1		(3) Policy support 1–5	
	mg. eff	s.e	mg. eff	s.e	coeff	s.e
<i>Policy characteristics:</i>						
Wealth tax	0.418***	(0.030)	0.449***	(0.031)	1.364***	(0.087)
Inheritance tax	0.346***	(0.023)	0.382***	(0.023)	1.137***	(0.070)
Income tax	0.163***	(0.029)	0.162***	(0.031)	0.424***	(0.077)
Tax revenues (billions)	−0.064***	(0.020)	−0.061***	(0.021)	−0.186***	(0.054)
<i>Individual characteristics:</i>						
Age <40	−0.031	(0.025)	−0.025	(0.027)	−0.070	(0.077)
Age 60+	0.075	(0.046)	0.072	(0.049)	0.308**	(0.146)
Male	0.015	(0.026)	−0.013	(0.028)	−0.060	(0.086)
Married	0.018	(0.024)	0.009	(0.026)	0.030	(0.076)
Low education	0.055	(0.040)	0.053	(0.043)	0.141	(0.122)
High education	0.017	(0.028)	−0.014	(0.030)	−0.038	(0.086)
Working	−0.009	(0.029)	0.004	(0.031)	0.035	(0.091)
Log income	0.065***	(0.025)	0.062**	(0.026)	0.098	(0.078)
Financial difficulties	−0.089	(0.061)	−0.143**	(0.065)	−0.401**	(0.193)
Home ownership	−0.040	(0.031)	−0.068**	(0.033)	−0.158*	(0.095)
Luxembourgish	−0.036	(0.025)	−0.057**	(0.027)	−0.191**	(0.080)
Constant					1.959***	(0.598)
Obs	2475		2106		2475	

Notes: Robust standard errors in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ . For model 1, the dependent variable takes value 1 if the individual answers “strongly agree” or “somewhat agree”, and it takes value 0 otherwise. For model 2, the neutral category is removed (“neither agree nor disagree”). For model 3, the dependent variable is the original Likert scale 1–5 from “strongly disagree” to “strongly agree”. The tax revenue variable is the expected revenue computed for each tax policy scenario showed to the respondent. The variables wealth tax, inheritance tax, and income tax are indicator variables for the type of tax. All regressions include dummy variables for the week the survey was collected, but their coefficients are not reported

answered the neutral category (neither agree nor disagree). Finally, the third column reports marginal effects from a linear random-effects regression when the dependent variable is the original Likert scale 1–5.

Regression estimates reveal a clear preference for a wealth tax and then for an inheritance tax, income tax and finally VAT. The first column of Table 2 reports that the probability of supporting a wealth tax is about 42 p.p. larger than the probability of supporting a consumption tax—controlling for the size of the total revenues. The distance in support for the wealth tax with respect to the support for the income tax is also sizable (26 p.p.). The estimates from the models in columns 2 and 3 confirm these results. Removing the neutral category leads to a larger preference for a wealth tax (45 p.p. larger than the support for a consumption tax). As expected from the descriptive results, the tax scenarios leading to higher revenues have less support.

**Table 3** Regression estimates of public support for tax policies (model 2)

Variable	Wealth tax		Inheritance tax		Labour income tax		VAT	
	mg. eff	s.e	mg. eff	s.e	mg. eff	s.e	mg. eff	s.e
<i>Policy characteristics:</i>								
Tax revenues (billions)	-0.073**	(0.031)	-1.395***	(0.473)	-0.057**	(0.026)	-0.272***	(0.092)
<i>Individual characteristics:</i>								
Age <40	-0.004	(0.043)	-0.086**	(0.042)	-0.034	(0.040)	0.016	(0.036)
Age 60+	0.037	(0.075)	-0.027	(0.073)	0.153**	(0.066)	0.122**	(0.060)
Male	0.069	(0.044)	0.032	(0.044)	-0.033	(0.041)	-0.009	(0.037)
Married	-0.020	(0.041)	0.042	(0.041)	0.041	(0.039)	0.012	(0.035)
Low education	0.063	(0.073)	0.147*	(0.075)	-0.112	(0.071)	0.101*	(0.060)
High education	0.088*	(0.045)	0.020	(0.047)	-0.032	(0.044)	-0.020	(0.040)
Working	-0.024	(0.049)	-0.056	(0.049)	-0.005	(0.048)	0.051	(0.044)
Log income	0.030	(0.040)	0.054	(0.040)	0.112***	(0.040)	0.064*	(0.034)
Financial difficulties	-0.032	(0.106)	0.079	(0.110)	-0.194*	(0.109)	-0.249**	(0.105)
Home ownership	-0.049	(0.050)	-0.137***	(0.051)	0.027	(0.048)	-0.015	(0.043)
Luxembourgish	-0.112***	(0.043)	-0.025	(0.044)	0.052	(0.040)	-0.067*	(0.036)
Obs	619		619		618		619	

Robust standard errors in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ . Each dependent variable takes value 1 if the individual answers strongly agree or somewhat agree, and it takes value 0 otherwise. The tax revenue variable is the expected revenue computed for each tax policy scenario showed to the respondent. The reported coefficients are the marginal effects. All regressions include dummy variables for the week the survey was collected, but their coefficients are not reported

Overall, an increase of 100 million EUR in tax revenues is associated with a reduction in the support for the tax of about 0.6 p.p.

Support for the hypothetical taxes does not appear to vary significantly with individuals characteristics. Notably, income is positively related with tax policy support in the first two models. In columns 2 and 3, in opposition to what Klemm and Mauro (2021) found, experiencing financial difficulties is negatively related to tax support. Speaking Luxembourgish at home (a proxy for Luxembourgish nationality) is also negatively associated to the support for taxes. Home ownership (an indicator of wealth) is negatively associated to tax support, but this is significant only in column 2. If overall support for taxes does not seem to vary much with individual characteristics, self-interest considerations could suggest however that individual characteristics may be more strongly associated with preferences over different types of taxes, rather than with overall support. We return to this point when discussing the other two models in Tables 3 and 4.

Table 3 shows the estimations of equation 2, that is, we run separate regressions for each tax policy and include the amount of tax revenues implied by each

**Table 4** Regression estimates of public support for tax policies (model 3)

Variable	Wealth tax	Inheritance tax	Labour income tax	VAT
<i>Policy characteristics:</i>				
	0.5%×2 m	5.0%×1 m	1.0%×2yr	0.25%×2yr
	(0.081)	(0.080)	(0.076)	(0.064)
	1.0%×2 m	5.0%×2 m	1.0%×3yr	0.25%×3yr
	(0.080)	(0.086)	(0.073)	(0.062)
	1.5%×2 m	7.5%×1 m	2.0%×1yr	0.50%×1yr
	(0.078)	(0.084)	(0.074)	(0.063)
	2.0%×2 m	7.5%×2 m	2.0%×2yr	0.50%×2yr
	(0.075)	(0.088)	(0.079)	(0.066)
	1.0%×4 m	7.5%×5 m	2.0%×3yr	0.50%×3yr
	(0.087)	(0.086)	(0.078)	(0.064)
	1.5%×4 m	10%×1 m	3.0%×1yr	1.0%×1yr
	(0.080)	(0.081)	(0.082)	(0.062)
	2.0%×4 m	10%×2 m	3.0%×2yr	1.0%×2yr
	(0.079)	(0.086)	(0.078)	(0.064)
		10%×5 m	3.0%×3yr	1.0%×3yr
		(0.085)	(0.080)	(0.070)
<i>Individual characteristics:</i>				
Age <40				
	-0.006	-0.088**	-0.035	0.019
	(0.042)	(0.043)	(0.040)	(0.036)
Age 60+				
	0.033	-0.028	0.148**	0.123**
	(0.075)	(0.073)	(0.066)	(0.059)
Male				
	0.067	0.034	-0.034	-0.009
	(0.044)	(0.044)	(0.040)	(0.036)
Married				
	-0.018	0.041	0.039	0.018
	(0.041)	(0.041)	(0.039)	(0.035)

Table 4 (continued)

Variable	Wealth tax	Inheritance tax	Labour income tax	VAT
Low education	0.074 (0.073)	0.143* (0.075)	-0.112 (0.070)	0.106* (0.059)
High education	0.093** (0.045)	0.019 (0.047)	-0.027 (0.044)	-0.019 (0.039)
Working	-0.028 (0.049)	-0.060 (0.049)	-0.005 (0.048)	0.052 (0.043)
Log income	0.031 (0.040)	0.054 (0.041)	0.113*** (0.040)	0.065** (0.033)
Financial difficulties	-0.053 (0.106)	0.073 (0.111)	-0.181* (0.110)	-0.252** (0.104)
Home ownership	-0.054 (0.049)	-0.141*** (0.051)	0.026 (0.048)	-0.015 (0.042)
Luxembourgish	-0.113*** (0.043)	-0.023 (0.044)	0.049 (0.040)	-0.076** (0.036)
Obs	619	619	618	619

Robust standard errors in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ . Each dependent variable takes value 1 if the individual answers strongly agree or somewhat agree, and it takes value 0 otherwise. The reference variable for the tax attributes is the combination of marginal tax rate and exemption amount or period leading to the lowest potential tax revenue. For the wealth tax is 0.5% and 4 million; for the inheritance tax is 5% and 5 million; for the labour income tax is 1.0% and 1 year; and for the VAT is 0.25% and 1 year. The reported coefficients are the marginal effects. All regressions include dummy variables for the week the survey was collected, but their coefficients are not reported

tax scenario.<sup>7</sup> Differences emerge regarding the association of tax revenues and tax support across the policies. In terms of the magnitude of variations on the support for tax policies, we observe that an increase of 100 million EUR in tax revenues is associated with a reduction of about 0.7, 13.6, 0.6 and 2.7 p.p. in the support for wealth, inheritance, income and value added taxes, respectively. Recall from Table 1 that tax collection varies greatly among tax policies, with the inheritance tax being the policy collecting less revenues (35–167 million EUR) and the wealth tax being the policy collecting the most (357–2,295 million EUR). Thus, the above mentioned marginal effects must be analysed according to the potential tax revenues. In terms of elasticity (evaluated at the means of tax support and tax revenues for each policy), we obtain that an increase of 1% in the amount of tax revenue leads to a reduction of 0.14%, 0.20%, 0.21%, and 0.35% in the support for wealth, inheritance, income and value added taxes, respectively.

Income is positively related with the support for a new temporary labour income tax and a temporary increase in VAT. This appears somewhat counter-intuitive as higher income respondents would pay a larger share of the proposed income tax. Note however the proposed income tax increase is not progressive: there is no exemption level and the *relative* contribution would not be larger for higher income people. This is unlike the proposed wealth and inheritance tax schedules which would be levied on the wealthy only. Moreover, with a lower marginal propensity to consume (Carroll et al., 2017), the burden of an increase in VAT would not be so high on high income individuals as it would be for poorer individuals.

Homeowners and younger individuals express lower support for inheritance taxation. Speaking Luxembourgish is associated with a statistically significant drop of 12.6 p.p. in the likelihood to support a one-time wealth tax. Note that native Luxembourg residents tend to be wealthier than foreign residents (Girshina et al., 2019) and would therefore be more likely to be affected by the wealth tax proposals. Luxembourgish speaking is also related with a drop of 7.3 p.p. in the probability to support an increase in VAT.

Financial difficulties is statistically significant in the support for a temporary labour income tax and a temporary increase in VAT. An increase of 1 p.p. in the index of financial difficulties is associated with a reduction of 0.19 p.p. and 0.25 p.p. in the probability of supporting temporary labour income and value added taxes, respectively. There is no statistically significant relationship between financial hardship due to COVID-19 and the support for a wealth tax.

The results of Table 4 are similar to those reported in Table 3, but instead of using the tax revenue collected for each policy-scenario, we include dummy variables for each of the tax scenarios presented to the individual. (Figure D-1 in Online Appendix D displays these estimates graphically.) In all regressions, the reference variable for the scenario dummies is the combination of marginal tax rate and exemption amount or period leading to the lowest potential tax revenue (i.e. lowest marginal tax rate and highest exemption amount), so that we should expect negative marginal

<sup>7</sup> The values of tax revenues used in the regressions come from Table 1. For the case of the income tax and VAT carried during 2 or 3 years, we multiply the potential tax revenue of one year by 2 and 3, respectively.

**Table 5** Regression estimates of public support for tax policies by societal concerns (augmented model 3)

Variable	Wealth tax	Inheritance tax	Labour income tax	VAT
Extremely concerned with the economy in general	0.013 (0.053)	0.061 (0.053)	-0.043 (0.051)	-0.016 (0.046)
Social cohesion	0.078 (0.058)	0.130** (0.058)	-0.058 (0.056)	-0.014 (0.053)
The evolution of share prices and other investments	-0.255*** (0.083)	-0.304*** (0.084)	-0.206** (0.094)	-0.133 (0.085)

Robust standard errors in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ . The regressions are as of Table 4 and including the covariates about societal concerns of the individual. Each dependent variable takes value 1 if the individual answers strongly agree or somewhat agree, and it takes value 0 otherwise. The reported coefficients are the marginal effects

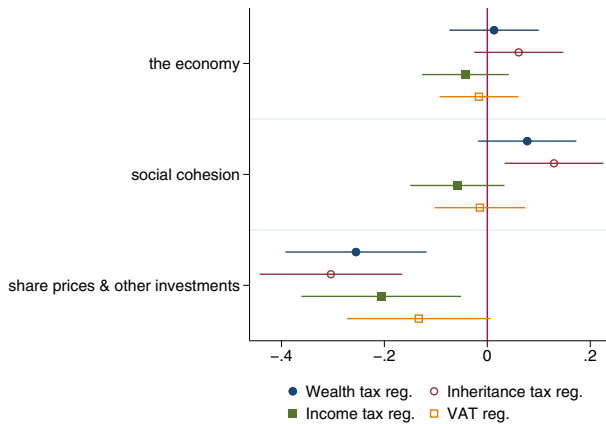
effects on tax support. For example, in the wealth tax, moving from a scenario with  $0.5\% \times 4$  m to another one with  $2.0\% \times 2$  m, the support for the wealth tax can drop by 20.1 p.p. The lowest statistically significant support for this tax is obtained when the features are a marginal tax rate of 2.0% and an exemption amount of 2 million EUR (which is the scenario collecting the most of revenues). The lowest support for the inheritance tax occurs when the marginal tax rate is 10% and the exemption amount is 1 million EUR, implying a marginal decrease of 21.2 p.p. with respect to the base scenario of  $5\% \times 5$  m. The scenario showing the lowest support for the income tax is a 3% tax rate for two years (18.3 p.p. marginal decrease), while for the VAT is a 0.50% tax rate for three year (20.8 p.p. marginal decrease). We return in Section 4.4 on the potential implications of these results.

### 4.3 Additional results

In an additional analysis, we inspected the relationship between the support for tax policy and whether the individual expressed concern about some challenges in the economy and society arising due to COVID-19. This was done by adding three additional variables to the list of individual characteristics in model 3. Two of the “concerns” included can be seen as ‘collective’ (concerns about social cohesion or, perhaps to a lesser extent, about the economy in general) while one can be seen as more ‘individualistic’ (concern about share prices and other forms of investment).

Regression estimates on these variables are shown in Table 5 and Fig. 3. We do not find any relation between being “concerned about the economy” and the support for tax policies, but we do find a positive relationship between being “concerned about social cohesion” and the support of inheritance taxes. It is interesting to find that people more concerned with social cohesion have also more favourable views on inheritance taxation since some of the arguments expressed in favour of inheritance taxation rest on fairness and distributive justice considerations (Schokkaert & Truys, 2017). Our estimates also show that individuals most “concerned with the





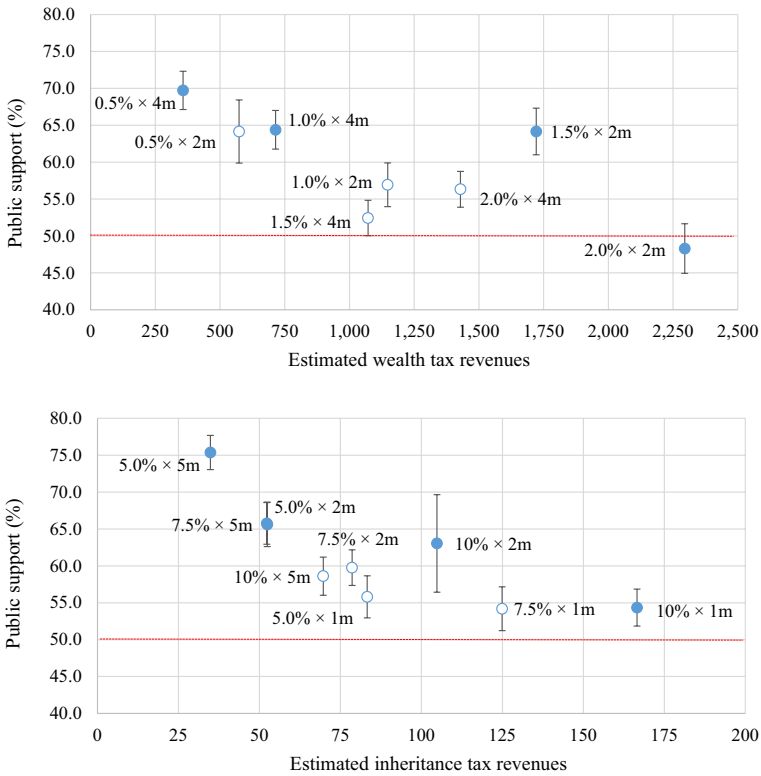
**Fig. 3** Estimated marginal effects of public support for tax policies and societal concerns. *Notes:* The figure plots the estimated coefficients of the covariates about societal concerns reported in Table 5. Confidence intervals are calculated at 90% of confidence

evolution of share prices and other forms of investments” are less in favor of all the tax policies considered, yet the size of the association is larger for wealth and inheritance taxes.

#### 4.4 Policy implications

Figures 4 and 5 show the relationship between the potential tax revenues and the conditional support for tax policies. In general, we observe an unsurprising negative relationship between revenues and tax support, but the relationship is not linear and some tax proposals appear to dominate others. We define a dominant proposal as one that both garners higher public support and expects higher tax revenues than another proposal. In each plot, configurations of tax parameters that are dominated by at least one alternative configuration are shown with hollowed markers and configurations that are not dominated by any other—within the same tax type—are shown with plain markers.

Although support for wealth taxation and inheritance taxation is much higher than for income and consumption taxes, differences in tax revenues for alternative configurations of parameters imply that no single tax type is dominated by all configurations of another tax type in our scenarios. For example, inheritance taxation brings much lower expected revenues than the wealth tax but one inheritance tax configuration ( $5\% \times 5m$ ) brings the highest support (at above 75%). The latter would be the optimal choice (among the proposed scenarios) for a government *only* sensitive to public support. Similarly, income taxation garners comparatively low support, but the configuration  $3\% \times 3yr$  is the one with the highest expected revenues

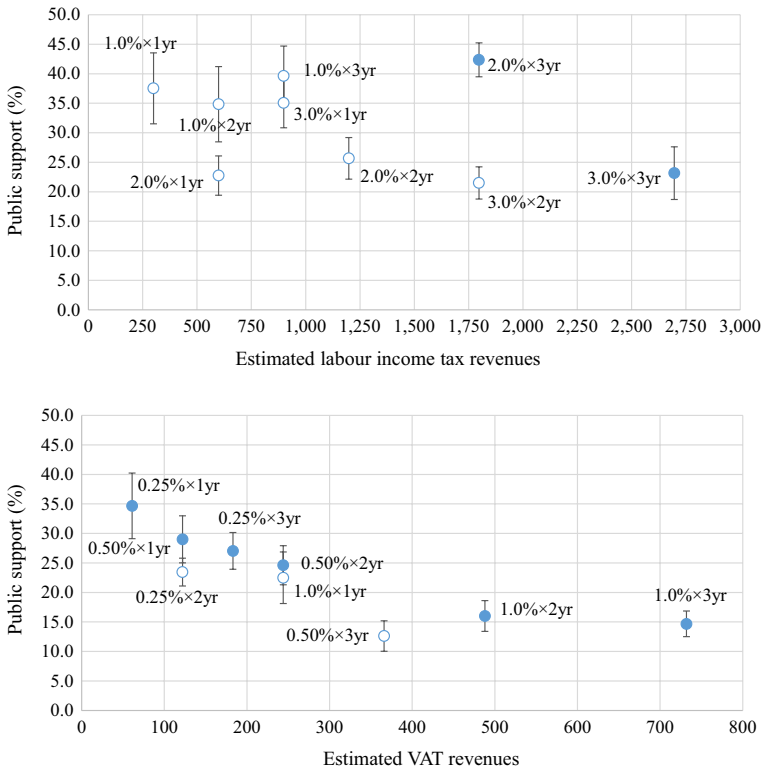


**Fig. 4** Public support (conditional estimates) for wealth and inheritance taxes and estimated revenues. *Notes:* The graphs plot the predicted percentage of individuals who support each type of tax policy against the estimated tax revenue implied by the policy. These values are computed with the regressions of table 4, and use calibrated population weights. The confidence intervals use 90% confidence level. The upper panel shows the results for the 8 scenarios of the wealth tax policy, and the bottom panel shows the results for the 9 scenarios of the inheritance tax policy

and therefore the optimal choice for a revenue-maximizing government unconcerned with public support.<sup>8</sup>

Due to nonlinearities in the tax scenarios and the heterogeneous public opinion about taxation, there is also no single dominant scenario within each tax type. We cannot determine which is the policy with both most public support and expected revenues. However, there are policy scenarios that dominate many others. For example, in the case of wealth taxation, the policy 1.5% × 2m dominates four other policies (0.5% × 2m; 1.0% × 2m; 1.5% × 4m and 2.0% × 4m). Since this policy shows a very similar public support as the policy 1.0% × 4m and a much larger revenue (1721 against 714 EUR millions), the government may prefer 1.5% × 2m to 1.0% × 4m. A possible workable compromise could be setting a one-time wealth tax policy closer to the scenario 1.0% × 2m, which could raise 1.8% of GDP.

<sup>8</sup> In a more realistic policy decision context, one should of course account for potential behavioural responses in the calculation of tax revenues.



**Fig. 5** Public support (conditional estimates) for income and value added taxes and estimated revenues. *Notes:* The graphs plot the predicted percentage of individuals who support each type of tax policy against the estimated tax revenue implied by the policy. These values are computed with the regressions of Table 4 and use calibration weights. The confidence intervals use 90% confidence level. The upper panel shows the results for the 9 scenarios of the labour income tax policy, and the bottom panel shows the results for the 9 scenarios of the VAT policy

The expected revenues from the policy scenarios of inheritance taxation are small, which is a common trend in other European tax systems (OECD, 2021). The policy raising the largest revenues is the one applying a tax rate of 10% to the inheritance amounts in excess of 1 EUR million.<sup>9</sup> This implies a revenue of 167 EUR (0.26% of GDP), which is larger than the 114 EUR millions collected in 2019 under the concept of *estate, inheritance and gift taxes*. Thus, introducing the taxation of inheritances above 1 EUR million received in direct line together with a 10% tax rate could more than double the current inheritance tax revenues. Keeping the same tax rate of 10% but applying it to inheritances larger than 2 millions may raise 105 EUR millions. The advantage of this last policy over the previous one is that this has higher public support (62.3% vs 53.9% according to conditional estimates). The bottom panel of Fig. 4 plots the expected tax revenues and the conditional public

<sup>9</sup> The exemption amount of 1 million has previously been advocated in the country by Caritas (2016) in its analysis of the last comprehensive fiscal reform of Luxembourg (that kicked off in 2018).

support for each policy scenario. There is not a dominant inheritance tax policy, but we find that policy  $10\% \times 2m$  clearly dominates two policies ( $7.5\% \times 2m$ ,  $10\% \times 5m$  and  $5.0\% \times 1m$ ). It seems the government could chose an scenario closer to  $10.0\% \times 2m$ .

Table 1 also includes the expected revenues from a temporary flat tax levied on labour incomes and a temporary increase in the VAT, although we only report the estimations performed for 2021 in order to compare the revenues across all the tax policies. We plot in Fig. 5 the expected revenues of all the alternatives of the income tax and VAT policy and their (conditional) public support.<sup>10</sup> As already mentioned in our descriptive analysis, individuals express low support both for labour income taxes and for increases in VAT rates. Across all the alternatives for the income tax, only an average of 31.2% of individuals support such a tax, whilst an average of 24.0% of individuals support an increase in the VAT. Given these results, the government may find difficult to introduce temporary labour income taxes or increases in VAT.

## 5 Discussion and conclusion

Relying on survey data from Luxembourg collected just after the first COVID-19 confinement, we have found that respondents would generally be supportive of the introduction of new taxes to bear the extraordinary financial costs of the pandemic. However, the form of taxation is important. Support for wealth and inheritance taxation is broad but opinions are less favourable to increases in VAT and income taxes.

Back-of-the-envelope calculations indicate that a one-time net wealth tax could raise substantial revenues and could obtain important public support. The introduction of a one-off wealth tax, as opposed to a permanent tax, also has attractive attributes. For example, Scheuer and Slemrod (2021) mention that this tax may not have behavioral distortions because it is only taxing past wealth accumulation and not future wealth. However, the authors note that this feature depends on the ability of governments to implement the policy on short notice and on the credibility of the government to stick to the temporary attribute of the policy and no re-introducing it.

An inheritance tax would also obtain support but would collect much less tax revenues. Cowell et al. (2019) show however that while inheritance taxation may involve low contemporaneous revenues, this tax has the ability to reduce the long-run distribution of wealth, i.e. lowering the equilibrium inequality in the future. It is standard to criticize inheritance taxes as unfair due to their double-taxation mechanism, i.e. the bequests have already paid taxes when they were earned in the past (e.g. accumulated savings from earnings). Against this critique, IMF (2017) argues that some incomes were never taxed in the past, so that taxing bequests may be seen as an opportunity to ensure minimum taxation; and any double taxation will mostly affect the very rich individuals if there is a sufficiently large exemption amount for the tax, which will strengthen the tax systems' overall progressivity.

<sup>10</sup> For this, we simply multiply by 2 or 3 the estimations done for the corresponding one-year tax revenues.

Scope for policy action is however constrained since our results also show that support for taxation declines with the size of expected revenues, irrespective of the tax instrument proposed.

The broader support for the wealth tax proposals relative to other types of taxes can have multiple explanations. The first is self-interest. The bulk of the tax would be borne by a minority of residents because our proposals have relatively large exemption levels and because of the high concentration of wealth (as compared to concentration of income or consumption). To the extent that a majority of respondents understand that ‘others’ would bear the cost, broad support from self-interested respondents is to be expected. A second potential explanation is preference for redistribution. Wealth is the most unequally distributed of the tax bases considered and the wealth tax schemes proposed have the strongest progressivity of the four. Stronger support for the wealth tax can arise from respondents’ preference for redistribution. A third tentative explanation is related to fairness considerations linked to perceptions about the nature of wealth itself. According to Stantcheva (2020), among the most important individual factors shaping preferences for tax policy are the perceived benefits of redistribution and fairness views (alongside views about the government). A high and sustained increase in housing values has driven wealth accumulation in Luxembourg (Mathä et al., 2018). Respondents may perceive such gains as only partially ‘deserved’ (or fair) and may therefore view wealth taxation as more acceptable than a tax on income or consumption. Respondents may have similar fairness views when thinking about wealth accumulation based on (weakly taxed) intergenerational transfers received. Fisman et al. (2020) show that individual support for wealth taxation increases when wealth comes from inheritance rather than own savings and Bastani and Waldenström (2021) find that informing respondents about the large salience of inherited wealth in the country and its link to equality of opportunity increases support for inheritance taxation. A fourth possible explanation is the one-time nature of a wealth tax proposal. As explained above, one-time taxes have advantages in terms of limiting behavioural responses and distortionary effects. Whether survey respondents factor in such more complex considerations in their answers is however uncertain. We are not able to distinguish between these (or other) possible explanations—but note that we generally find only statistically weak associations between respondent characteristics and support for different types of taxes in our regression results.

Our analysis was conducted in the context of the COVID-19 pandemic. The justification of the tax proposals in the survey were expressly framed “to finance measures supporting the economy and protecting households who have faced income losses”. Whether the patterns observed are generalizable to other contexts is an open question. In the absence of a pre-pandemic benchmark, we are unable to assess how much of the support is directly linked to the pandemic context and how much it reflects general attitudes portable to other, possibly less extraordinary, situations. We expect that the relatively high public support for taxation might be influenced by the context of the pandemic. However, there is no compelling reason to believe that the higher support for wealth and inheritance taxation relative to income or consumption taxes would be context-specific. Similarly, we do not expect the finding

of a decline in the support of a tax as a function of the size of the tax to be context-dependent, although the magnitude of this effect is likely to be.

What results from Luxembourg residents can possibly tell about attitudes in other countries is of course an open question. We expected support for taxation in Luxembourg to be comparatively low. We are looking at a country which was in a favourable fiscal position at the onset of the pandemic. The excess spending caused by the pandemic and policy responses was expected at the time of the survey to be similar to other European countries (in percentage of GDP). Substantial increases in taxation were therefore not necessarily perceived as “inevitable” in this context. Also, personal taxation was comparatively low in a European context at the baseline: Luxembourg does not have net wealth taxation and has comparatively low property tax, has limited inheritance taxation, has comparatively low VAT, and has moderate personal income taxation. Low tax levels at the baseline may reflect low acceptance for taxation generally—although it could also mean that some margin of action for tax increases exist. Overall, the support for a wealth tax that we observe is not very different from what is reported in other rich countries in WID (2021). Support (as we show) however depends on specific parameters and it is therefore difficult to compare results across studies.

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