Income, Taxes and Happiness*

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Abstract

We combine the subjective well-being and the public finance literature analyzing the effect of paying taxes on individual happiness. Using a long panel of very rich German household data we show that conditional on net income paying taxes is associated with higher levels of happiness. Increasing taxes by 1 standard deviation yields an increase in happiness by 2.7 standard deviations. In accordance with optimal tax theory, this positive effect is higher for people who consume public goods more frequently and for individuals that benefit more from redistributive policies. When conditioning on gross income, tax payments lead to a reduction of personal income and, hence, exhibit a negative effect on subjective well-being. Decomposing the population into subgroups, we show that East Germans, who have been brought up in a system with much more government intervention, tend to be relative more happy to pay taxes. Following the intuition, more educated individuals and leftist individuals are happier to pay taxes.

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1 Introduction

The economic literature on subject well-being (SWB) has grown substantially in the past two decades. While happiness research touches upon labor, health, family economics as well as other domains of profession[1], relative little research has been conducted in the field of public economics. This is especially interesting, since taxation, one of governments' main activities, is directly related to one of the most investigated questions in the happiness literature, that is the relationship between subjective well-being and income. One finding, which is accepted by most scholars, is that income has a positive effect on SWB in cross-sections, yet there is substantial adaptation, which weakens the positive relationship of income and SWB in time-series. Moreover, individuals compare themselves to others, thus relative income matters (Clark and Oswald, 1996; Ferrer-i Carbonell, 2005; Luttmer, 2005).

Relying on these stylized facts, the effect of taxation, interpreted as a withdrawal of personal income, on happiness should be negative. On the other hand, tax revenues are used to finance public goods whose consumption should generally increase well-being. The question of which effect predominates is an empirical one. On a different note, the progressivity of a tax system has an effect of one's relative position in the income distribution and thus have implication on the status, which clearly matters in happiness research.

Using 26 waves of the German Socio-Economic Panel (SOEP), a household panel that has often been used for subjective well-being research, we investigate the relationship between taxation and SWB. To the best of our knowledge, this is the first study addressing this issue. The very detailed household data allow us to differentiate the effect of taxes for different socio-economic groups, e.g. by political orientation.

We find that controlling for net income, taxation has a positive, significant and robust effect on happiness. Conditional on net income, a 1 percent increase in tax payments yields a 0.06 point increase in happiness, which is measured on a scale from 0 to 10. Intuitively, the effect of taxation on happiness is significantly negative

[1]See Oswald (1997); Frey and Stutzer (2002); Di Tella and MacCulloch (2006); Kahneman and Krueger (2006); Blanchflower and Oswald (2011) for survey articles.

when controlling on gross income instead.

The different sign of the tax coefficient depending on the income definition used as control is interesting – in particular when thinking about public goods which are financed though tax payments. We show that individuals who consume public goods less frequently are relatively less happy (more unhappy) to pay taxes when controlling for net (gross) income.

Looking at tax rates, we find that in line with public finance theory, average tax rates have a much higher positive effect on happiness than marginal tax rates. Interestingly, the positive effect on overall taxes seems to stem from income taxes, while payroll taxes have a negative effect on subjective well-being.

Decomposing the population into subgroups, we show that rich are less happy to pay taxes than poor ones and that people from former Eastern Germany, who have been brought up in a system where the government played a much bigger role, tend to be relative more happy to pay taxes. Our results are robust, in particular with respect to potential non-linear relationship between income and happiness - as well to the data, model and happiness measure used.

The rest of the paper is set up as follows. Section 2 gives a short overview of the existing subjective well-being literature with respect to government activity and taxation. Section 3 describes the data, Section 4 the model. We present our results in Section 5, while Section 6 concludes.

2 The effect of Taxes on Happiness

As far the association between the size of the government (or equivalently the welfare state) and the average life satisfaction of a nation is concerned, the evidence is mixed, ranging from a negative (Bjørnskov et al., 2007) to no effect (Veenhoven, 2000) of government size on a nation's average subjective well-being. In contrast, Bjørnskov (2003) shows that a country's social capital has a positive effect on average happiness of its citizens, explaining the high values observed in Switzerland and Scandinavia - a result confirmed by Helliwell (2003, 2006). Hessami (2010) finds an inverted U-shaped relationship between government spending and subjective well-

being analyzing individual data from 12 European countries for the period of 1990-2000.

As far as state interventions are concerned, Flavin et al. (2011) finds a positive association between state intervention and happiness in advanced industrial democracies, but only if the level of political freedom is not too high. In a similar, Frijters et al. (2004a) using the German unification as a natural experiment show that East Germans experienced an rise in subject well-being after the fall of wall. Similarly, Diener et al. (1995) show that people appreciate (in terms of subjective well-being) more political rights and more political freedom. Helliwell and Huang (2008) show that quality of government has a positive association with happiness. Finally, Frey and Stutzer (2001) show that institutional factors, such as direct democracy and local autonomy, systematically and sizeably raise self-reported individual well-being in a cross-regional econometric analysis. Di Tella et al. (2003) find that welfare states appear to be compensating forces: higher unemployment benefits are associated with higher national well-being – a result consistent with the finding of Alesina et al. (2004) who show that inequality has a negative effect on SWB, especially for Europeans, which perceive themselves to live in a less mobile society than the US.

Looking specifically on taxation and happiness the number of studies is rather limited. Theoretically, Oswald (1983) shows that if people's decisions are not altered by consumption of others, then optimal tax rates should be higher in a jealous world and lower in an altruistic one. Layard (2006) discusses the implication for optimal taxation in the light of the well-known adaption and social comparison effects, which have been recovered from the happiness literature. The paper is related to earlier work (Layard (1980)), in which status concerns and income expectations are accounted for in the government's maximization of human satisfactions. There are also a few theoretical papers, which depart from the findings of happiness research to reassess optimal taxation from a legal perspective (see Griffith (2004), Bagaric and McConvill (2005) or Weisbach (2008)).

Empirically, Gruber and Mullainathan (2005) show that higher excise taxes on cigarettes make people with a higher probability to smoke happier. As far as income taxation is concerned, Oishi et al. (2011) use the Global Gallup Poll data to

examine the effect of progressive taxation on happiness. They find that progressivity is positively associated with the subjective well-being. Furthermore, they show that this positive effect comes through the citizens' satisfaction with public goods such as education and public transportation. This finding is line with the results of a series of papers (Frey et al. (2009), Luechinger (2009), Luechinger and Raschky (2009)), which shows that people do value public goods. The underprovision of a public good (and as a consequence the prevalence of terrorism, pollution or flood disasters respectively) has a negative effect on life satisfaction. In a similar vein, Lubian and Zarri (2011) show that tax morale (i.e. paying taxes) has a positive effect on subjective well-being using Italian household data of the year 2004. [2]

3 Data

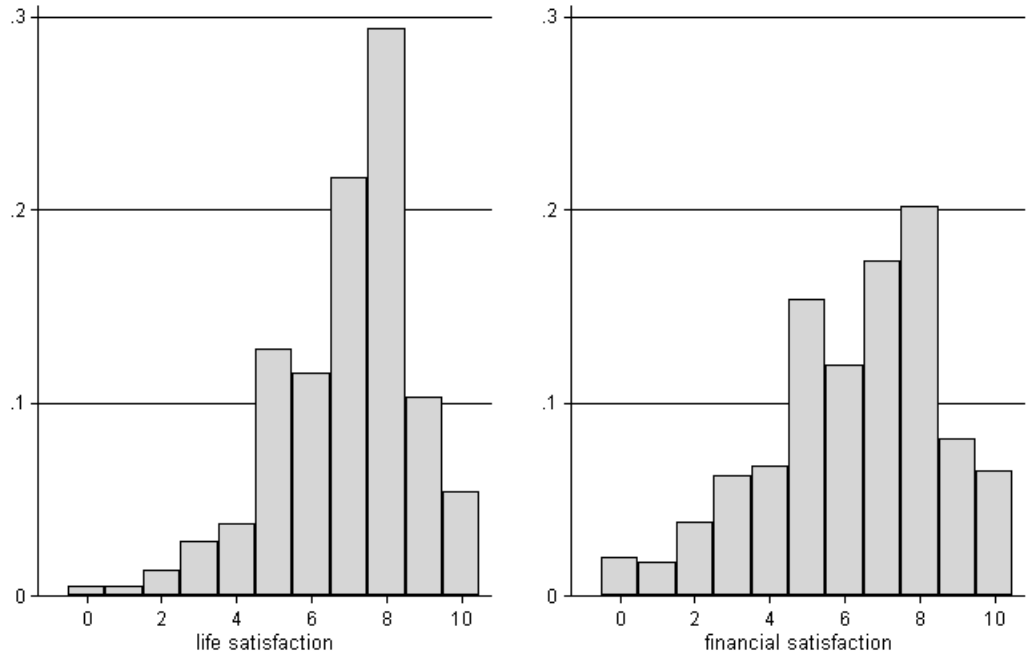
3.1 Data source

The German Socio-Economic Panel (SOEP) is a well-known household survey. It is a representative survey of the entire German population with about 25,000 sample individuals living in more than 10,000 households per cross-section (East Germany was added in 1990) (see Wagner et al. (2007)). We select the waves 1985 to 2010, constructing a panel of more than 110,000 individual-year observations in our baseline specification.

The SOEP contains very detailed labor-market related information such as labor-market status, gross wage, job type, industry, working time, household composition, age, education levels and housing costs. More specifically. Important for our study, we have information on total gross earnings and total taxes paid for the preceding months. In addition, a set of subject well-being questions is asked throughout the whole sample period. Besides the standard question on general life

[2]There is an even smaller empirical literature on the role of social benefits on subjective well-being. Kassenboehmer and Haisken-DeNew (2009) analyze the role of social assistance on happiness using the SOEP and a panel from 1995-2004 and find that social assistance has a strong negative effect on happiness, when controlling for income. In contrast using a natural experiment, Ifcher (2011) studies the effect of the 1997 US welfare reform and shows that the reform on average had a positive impact on happiness (Related papers analyzing the effect of health reforms on measures are of health outcome Blank, 2002; Bitler et al., 2005; Bitler and Hoynes, 2006).

Figure 1: Subjective well-being measures



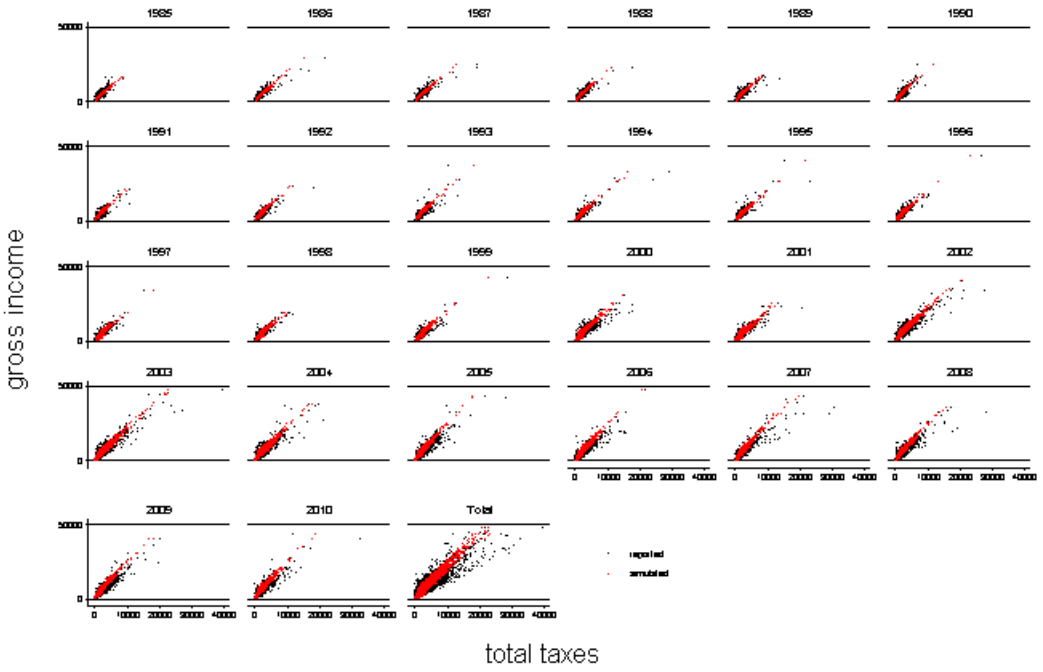
satisfaction ("*How satisfied are you with your life, all things considered?*"), there are several other questions asking the satisfaction with several domains such as income, job or living conditions. All SWB questions are coded on an 11-point scale, with 0 meaning totally unhappy and 10 meaning totally happy.[3] Figure 1 shows a histogram of general life satisfaction levels over the whole observation period 1985-2010.

3.2 Income and tax liabilities

Our measure of income is reported gross and net labor earnings of the month preceding the interview. The difference between the two variables are total taxes, which consist of income and payroll tax payments. This is the most immediate measure of income and taxation in the SOEP with respect to the subjective well-being questions asked. There are, however, several shortcoming of this measure. First, other earnings such as capital income or government benefits are not available for the current month of the interview. Secondly, we are not able to differentiate between

[3] The SOEP has been widely used in studies on subject well-being (see e.g. Frijters et al. (2004a,b); Ferrer-i Carbonell (2005); Luechinger et al. (2010)).

Figure 2: Correlation of monthly and simulated data by year



income and payroll taxes which might affect SWB differently.

For these reasons, we also link the SOEP data to the the tax and benefit simulation model of the Institute for the Study of Labor, IZAΨMOD, which incorporates all important features of the German tax and transfer system over the complete sampling period (see Peichl et al. (2010) and Peichl and Siegloch (2011)). The simulated income variables enable us to both have a more precise picture of household income including family (and potentially welfare) benefits and to disentangle the effect of income and payroll taxes.

To check whether the tax simulation works well, we plot monthly and simulated taxes against gross income for all years in our sampling period. Figures 2 reassuringly shows the high correlation between the two measures.

4 Empirical model

We estimate a standard happiness equation:

$$S_{it} = \alpha_0 + \boldsymbol{\alpha}\mathbf{I}_{it} + \boldsymbol{\beta}\mathbf{X}_{it} + \mu_i + \mu_t + \epsilon_{it} \quad (1)$$

of general life satisfaction, S_it on a set of standard socio-demographic control variables, $\mathbf{X}_{it}$,[4] and a vector $\mathbf{I}_{it}$, which contains different logged income measures depending on the specification. More precisely, $\mathbf{I}_{it}$ will contain only net income in our first model. In the second specification, we add taxes so vector $\mathbf{I}_{it}$ contains two elements net income and taxes. In the third specification, we replace net by gross income. This decomposition will allow us to separate out the distinct effects of income and taxes. In addition, we include time and State fixed effects.

We estimate the equation 1 using the Quasi Fixed-Effects (QFE) estimator (Akay and Martinsson, 2009). In principle, QFE uses an auxiliary distribution for the unobserved individual characteristics μ_i, decomopsing it into a time-varying and a time-invariant part (Chamberlain, 1984). We check the robustness of our results with respect to the estimator below.

5 Results

The following results are, if not stated differently, based on monthly reported income measures, which is the cleanest and most immediate income concept as it is not simulated and relates to incomes (and tax payments) of the month before the interview. Moreover, the sample covers all individuals in households (single and couple households) that pay taxes.

5.1 Baseline results

Table 1 presents the baseline results using a Quasi-Fixed Effects model and the monthly data. Specification (1) reveals that net income has a significantly positive effect on subject well-being. In specification (2) we add log tax payments to model. Interestingly, we find that when controlling for net income, people do not mind paying taxes. In fact, the opposite is true: paying taxes increases happiness. The coefficient suggests that a 1% increase in taxes yields a 0.06 point increase in the happiness score. In other words: an increase of 2% of the standard deviation of taxes payments, corresponds to 5% of a standard deviation of the happiness measure

[4] Including for instance age, skill as well as controls indicating labor market and family status.

within individuals over time. This positive effect of paying taxes could be due to the additional consumption of public goods which are financed by taxes. Another possible explanation, which we will address below is, that the coefficient might reveal an indirect inequality aversion of the people. We try to disentangle this effect further below.

Table 1: Baseline effects on life satisfaction, Quasi Fixed-Effects

Model	(1)	(2)	(3)
log net income	0.298***	0.263***	
	(0.014)	(0.015)	
log gross income			0.453***
			(0.022)
log total taxes		0.055***	-0.095***
		(0.009)	(0.013)
controls	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes
Adjusted/Pseudo R^2	0.293	0.293	0.294
Observations	113088	113088	113088

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

On the other hand, when decomposing net income into gross income and taxes as done in specification (3), the coefficient on gross income is much higher, whereas the tax effect turns negative. In other words, people experience a disutility when paying taxes, if we do not condition on their net income. Every extra dollar of taxes paid will reduced their net income. The coefficients on the covariates reveal well-known patterns: life satisfaction decreases with age; qualification has a positive impact on SWB, women are on average happier, while having children decreases happiness.

5.2 Identification

Naturally, gross and net income are both highly correlated with taxes. This might give rise to identification problems. We have to distinguish between econometric and economic identification. From an econometric point of view, it is sufficient that

income and taxes are not perfect correlates to identify the model. In the sample correlation between net income and taxes is around 0.9 both between individuals and within individuals over time. Although the correlation is not perfect, it is high, which leads to inflated variances and thus multi-collinearity problems. Yet, our results are highly significant even though our standard errors are likely to be upward biased, which shows that our coefficients are very precisely estimated. Finally, and in accordance with the point made below, we estimate our baseline model using maximum likelihood random effects and perform a likelihood ratio test on whether adding taxes to the model significantly increases the fit of the model. Results in Table 2 show that taxes improve the explanatory power of the model significantly.

Table 2: Effects on life satisfaction, ML-QFE estimates

Model	(1)	(2)
life satisfaction		
log net income	0.302***	0.265***
	(0.011)	(0.013)
log total taxes		0.055***
		(0.008)
controls	Yes	Yes
year fixed effects	Yes	Yes
Likelihood ratio	-190802	-190780
Observations	113088	113088
Likelihood ratio test		
LR chi2(2)	42.65	
Prob chi2	0.000	

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

From an economic point of view, identification might be scrutinized if the relationship between income and subjective well-being is non-linear (which is probably the case) and taxes, being itself a non-linear function of income, would simply capture this non-linearity. Taking logs of income and taxes is a first step to take into account the non-linear relationship between income and SWB, yet it might not be enough. In order to rule out the mentioned spurious correlation, we re-estimate our baseline specifications (2) and (3) from Table 1, replacing the logged income

variables with higher order income terms (up to the order of 10). Especially the higher-order polynomials, which are close to a non-parametric estimation, are flexible enough to capture any non-linear relationship between income and SWB. Table A.1 in the Appendix shows that effect of taxes remain significant and are very close to our baseline results.

5.3 Public goods

The public economics literature offers a potential explanation for the results positive coefficient on taxes when controlling for net income. Taxes are used to finance public goods and thus higher taxes lead on average to a higher public good consumption. The SOEP provides individual information on public good consumption (measured by the cultural activity of each individual). We exploit this variable to see whether people who attend public exhibitions and concerts more often are happier when paying taxes than those who do not consume these kinds of public offers. Table 3 shows that more culturally active people on average are more happy. Table 4 show that people who consume cultural public goods at least once a month do in fact enjoy paying taxes, while people who never make use of such public goods do not exhibit a significantly positive coefficient. This evidence is thus in favor of the public good hypothesis.[5]

Table 3: Mean values by by cultural activity

	life satisfaction	net income	gross income	total taxes	working hours
once a month	8.43	3284	5157	1873	33.7
less frequent	8.11	2753	4260	1506	33.4
never	7.85	2175	3278	1103	30.9
total	8.07	2622	4036	1414	32.6

[5] Note that we have also merged metropolitan area information on public good expenditure per capita to the SOEP to check whether people in regions with higher per capita expenditure are relatively happier to pay taxes. Yet, the regional variation was not enough to identify significantly different effects across public good intensity.

Table 4: Effects on life satisfaction - by by cultural activity

Model	(1)	(2)	(3)
log net income (once a month)	0.223***	0.175***	
	(0.022)	(0.027)	
log net income (less frequent)	0.283***	0.259***	
	(0.016)	(0.019)	
log net income (never)	0.333***	0.292***	
	(0.022)	(0.026)	
log total taxes (once a month)		0.066***	-0.038
		(0.019)	(0.028)
log total taxes (less frequent)		0.041***	-0.101***
		(0.012)	(0.017)
log total taxes (never)		0.064***	-0.118***
		(0.016)	(0.023)
log gross income (once a month)			0.312***
			(0.039)
log gross income (less frequent)			0.437***
			(0.026)
log gross income (never)			0.532***
			(0.036)
controls	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes
Adjusted R^2	0.296	0.296	0.297
Observations	110396	110396	110396

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

5.4 Inequality aversion

Another potential explanation for the positive coefficient of taxes when conditioning on net income might be that people are inequality averse (cf. Fehr and Schmidt (1999)) As taxes are used for redistribution which reduces inequality. In order to test this we will calculate State level Gini coefficients for every year and include them in the regression.

Results to be available soon

5.5 Tax rates and tax types

In this subsection, we intend to show first whether marginal or average tax rates have an effect on happiness. Second, we want to explore whether income taxes have a different effect on taxes than payroll taxes (which serve basically as insurance contribution in case of illness, unemployment and retirement). For both exercises we cannot rely on the monthly data. In order to calculate marginal tax rates, we need a counterfactual reform increasing gross income by a small amount. In addition, we are not able to disentangle payroll and income taxes in the data. We therefore make use of the tax-benefit calculator IZAΨMOD and use simulated income data instead.

In order to show the validity of our tax-benefit simulations, Table 5 shows that results are almost identical when using simulated data - implying that the tax-benefit calculator mimics the actual tax and transfer system reasonably well.[6]

[6] A results also suggested by Figure 2.

Table 5: Effects on life satisfaction - by data source

Data	Monhtly		Simulated	
Model	(1)	(2)	(3)	(4)
log net income	0.275***		0.288***	
	(0.019)		(0.032)	
log gross income		0.476***		0.439***
		(0.026)		(0.045)
log taxes	0.065***	-0.088***	0.072***	-0.071**
	(0.011)	(0.016)	(0.023)	(0.034)
controls	Yes	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	0.294	0.295	0.294	0.294
Observations	96873	96873	96873	96873

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

Yet, we dropped two percent of the observations: one percent for each the largest positive and negative differences between reported and simulated tax payments. Moreover, we had to restrict the analysis to tax payers that do not dispose of any income from self-employment since the monthly taxes payments are very different from the yearly one, which are simulated by IZAΨMOD.[7]

As far as tax rates are concerned Table 6 shows that both marginal and average tax rates have a positive effect on subjective well-being when conditioning on net income. Interestingly and line with public finance theory the effect of the average tax rate is much higher than the effect of the marginal tax rate.[8] Conditional on gross income, both tax rates do not affect happiness.

[7] After the simulation all income variables are divided by 12 to make them comparable to the monthly data

[8] In fact, in theory, the marginal tax rate should have a zero effect on well-being, while the effect of the average tax rate should be positive.

Table 6: Effects of tax rates on life satisfaction

Model	(1)	(2)	(3)	(4)
log net income	0.332***		0.356***	
	(0.017)		(0.017)	
log gross income		0.355***		0.362***
		(0.017)		(0.016)
average tax rate	0.007***	0.000		
	(0.001)	(0.001)		
marginal tax rate			0.002**	-0.001
			(0.001)	(0.001)
controls	Yes	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes	Yes
Adjusted/Pseudo R^2	0.295	0.295	0.295	0.295
Observations	99451	99451	99451	99451

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

As far as tax types are concerned, Table 7 suggests that paying income taxes increases subjective well-being, whereas paying payroll taxes decreases happiness. This results is somewhat puzzling since payroll taxes are used to finance social security and thus follow an individual and direct insurance motive, whereas income taxes are used for redistributive activities.

Table 7: Effects of tax type on life satisfaction

Model	(1)	(2)	(3)	(4)
log net income	0.235***		0.292***	
	(0.029)		(0.023)	
log gross income		0.423***		0.356***
		(0.044)		(0.024)
log total taxes	0.099***	-0.065*		
	(0.021)	(0.033)		
log income taxes			0.027***	0.002
			(0.007)	(0.008)
log payroll taxes			-0.016**	-0.031***
			(0.007)	(0.007)
controls	Yes	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes	Yes
Adjusted/Pseudo R^2	0.294	0.295	0.295	0.296
Observations	99665	99665	99665	99665

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

5.6 Heterogenous effects

In this section we test, wether the effects of taxes on happiness change for different subgroups. Note that all analyses are conducted for the tax payer sample. Descriptive statistics for all subgroup decompositions, including information on average life satisfaction, incomes, tax and working hours can be found in the Appendix (Tables A.2 to A.5).

Income quintiles First we check whether the positions of the subgroups in the income distribution affects your view on paying taxes. Thus, we interact the income and tax variables with a dummy variable for income quintiles. Table 8 shows that the relationship between gross/net income and happiness and the position in the distribution follows a U-shaped pattern. Even more interesting is that that the poor prefer to pay, while the rich do not conditional on net income. This might be explained by the fact that the poor pay a relatively small amount of taxes due to the progressive system while they benefit disproportionably more from the public goods

consumption. When conditioning on gross income all groups show a disutility of paying taxes, which is linearly increasing when moving up in the income distribution.

Table 8: Effects on life satisfaction - by income quintiles

Model	(1)	(2)	(3)
log net income (quint1)	0.189***	0.169***	
	(0.026)	(0.026)	
log net income (quint2)	0.165***	0.170***	
	(0.036)	(0.037)	
log net income (quint3)	0.240***	0.251***	
	(0.036)	(0.037)	
log net income (quint4)	0.240***	0.246***	
	(0.036)	(0.037)	
log net income (quint5)	0.233***	0.260***	
	(0.028)	(0.030)	
log total taxes (quint1)		0.087***	-0.037*
		(0.018)	(0.022)
log total taxes (quint2)		0.006	-0.084***
		(0.022)	(0.026)
log total taxes (quint3)		-0.020	-0.127***
		(0.024)	(0.028)
log total taxes (quint4)		-0.011	-0.139***
		(0.023)	(0.028)
log total taxes (quint5)		-0.050**	-0.207***
		(0.021)	(0.031)
log gross income (quint1)			0.432***
			(0.043)
log gross income (quint2)			0.388***
			(0.055)
log gross income (quint3)			0.439***
			(0.054)
log gross income (quint4)			0.466***
			(0.053)
log gross income (quint5)			0.444***
			(0.047)
controls	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes
Adjusted R^2	0.294	0.294	0.294
Observations	113088	113088	113088

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

Qualification We also differentiate the attitudes towards paying taxes by skill-level (in terms of education). High-skilled individuals have obtained a degree from a university or a technical college. Medium-skilled have completed vocational training or obtained the highest German high school degree *Abitur*. Low-skilled have neither completed a vocational training nor obtained the *Abitur*. From Table 9 it becomes obvious that the higher the skill level, the happier individuals are to pay taxes, conditional on net income (specification 2). This might be explained by the better knowledge of the political system and the necessity to pay taxes. Moreover, this evidence rules out that the tax results are purely driven by the position in the income distribution as Tables 8 might suggest. As income increases with skill-level (Table A.3), it is the relatively rich who like to pay more taxes in this subgroup analysis.

Table 9: Effects on life satisfaction - by skill level

Model	(1)	(2)	(3)
log net income (high skilled)	0.304***	0.254***	
	(0.019)	(0.023)	
log net income (medium skilled)	0.294***	0.264***	
	(0.017)	(0.019)	
log net income (low skilled)	0.310***	0.279***	
	(0.041)	(0.049)	
log total taxes (high skilled)		0.066***	-0.052**
		(0.015)	(0.022)
log total taxes (medium skilled)		0.051***	-0.113***
		(0.012)	(0.017)
log total taxes (low skilled)		0.049	-0.113**
		(0.031)	(0.046)
log gross income (high skilled)			0.388***
			(0.034)
log gross income (medium skilled)			0.480***
			(0.026)
log gross income (low skilled)			0.484***
			(0.069)
controls	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes
Adjusted R^2	0.293	0.293	0.294
Observations	113088	113088	113088

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

East/West Third, we check for regional difference in Germany. More specifically for a East-West divide in terms of attitudes towards the role of the government. This divide could a priori be caused by growing up in different political systems with very different orientation. As it turns out from looking at Table 10 Eastern Germans are indeed happier to pay taxes conditional on their income.

Table 10: Effects on life satisfaction - by East/West

Model	(1)	(2)	(3)
log net income (west)	0.270***	0.258***	
	(0.015)	(0.017)	
log net income (east)	0.382***	0.268***	
	(0.028)	(0.031)	
log total taxes (west)		0.025**	-0.108***
		(0.010)	(0.015)
log total taxes (east)		0.161***	-0.049*
		(0.019)	(0.027)
log gross income (west)			0.421***
			(0.024)
log gross income (east)			0.560***
			(0.042)
controls	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes
Adjusted R^2	0.293	0.294	0.295
Observations	113088	113088	113088

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

Political preference In a similar vein, political preferences might shape one's view on paying taxes. Thus we differentiate between left and right by interacting the variables of interest with a dummy indicating the political preference, where leftist is defined as voting for the Social Democratic Party (SPD) or the Green Party (*Die Grünen*) of the Left party (*Die Linken*) or any possible coalition containing those parties. Rightist is defined as having a preference of the Christian-Democratic Party (CDU/CSU) or the Liberal Party (FDP) or a coalition of the two. Indeed, following the intuition, we find that leftist seem to be more willing to pay taxes independent of the income definition used as control (Table 11).

Table 11: Effects on life satisfaction - by political preferences

Model	(1)	(2)	(3)
log net income (rightist)	0.270***	0.262***	
	(0.036)	(0.043)	
log net income (leftist)	0.353***	0.322***	
	(0.036)	(0.043)	
log total taxes (rightist)		0.018	-0.117***
		(0.029)	(0.041)
log total taxes (leftist)		0.045	-0.104**
		(0.029)	(0.041)
log gross income (rightist)			0.414***
			(0.061)
log gross income (leftist)			0.483***
			(0.060)
controls	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes
Adjusted R^2	0.292	0.292	0.293
Observations	20629	20629	20629

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

Other groups We also decompose the tax effects by gender, work intensity and labor market group (i.e. wage workers, self-employed, civil servant). Yet, we do not find systematic differences between those groups.

5.7 Robustness

We conduct several robustness checks, the results of which are presented in the Appendix. First, we check the sensitivity of our results with respect to the estimator. As noted above we apply the quasi fixed-effects (QFE) estimator following Akay and Martinsson (2009). Potentially, there are two things to worry about. First, QFE might not take out all unobserved individual effects. Second, subjetive well-being is measured on a ordinal not a cardinal scale, which is not taken into account when using a linear random effects model. Both concerns, however, can be discarded, as Table A.6 suggests, as OLS, Fixed Effects and Ordered Probit estimators yield basically identical results.

Secondly, there is no clear rule of how to treat individuals in couples and their incomes. Is spouse income a public good, or a private good? What is the

sharing rule? In order to check he sensitivity of our results, we first estimate the baseline model separately for singles and couples (see Table A.7). Results are quite similar, but individuals in couples seem to be less happy to pay taxes. Secondly, we experiment with the definition of income for couples suggesting two extreme scenarios: couple income might be 100 per cent a public good, meaning that each spouse gets assigned the full household income (and full tax liabilities) or it might be a 100 per cent a private good, meaning that each partner only get half of the income.[9] Table A.8 presents the results.

Moreover, Table A.9 shows that the results are qualitatively comparable when using financial satisfaction instead of general satisfaction as dependent variable. Yet, and reassuringly, the magnitude of the effects is much higher, when looking at the financial satisfaction which is more closely related to income concerns. Finally, as Tables A.10 and A.11 in the Appendix suggest, the results are neither sensitive to whether we use net or disposable income nor to the health measure used as a control variable.[10]

6 Conclusion

In this paper, we combined the subjective well-being and the public finance literature analyzing the effect of paying taxes on individual happiness. From a theoretical perspective, taxes are a withdrawal of personal income, on the one hand, which should yield negative effects on subjective well-being. On the other hand, taxes are used to finance public goods, which, in turn, are consumed by (parts of) the taxpayers. This public good consumption should yield increasing levels of happiness.

Using 26 waves of the German Socio-Economic Panel, we do find that controlling for net income, taxation has a positive, significant and robust effect on happiness. This positive effect is indeed higher for individuals consuming public goods more frequently. It is also higher for people at the lower part of the income

[9] We assume a 50:50 sharing rule.

[10] In the baseline, we use the most common health measure,i.e. the subjective evaluation of personal health measured on a 1-5 scale. as alternatives we employ satisfaction with health and a more objective measure, measuring annual doctoral visits.

distributions, i.e. those who benefit more from redistributive policies. In line with public finance, theory the effect of the average tax rate is much more positive than the coefficient of the marginal rate.

We also find evidence in favor of our hypothesis of withdrawn personal income. When conditioning on gross instead of net income, taxes have an unambiguously negative and significant sign for all subgroups. Decomposing the population into subgroups, we show that Eastern Germans, who have been brought up in a system where the government played a much bigger role, tend to be relative more happy to pay taxes. Following the intuition, more educated individuals and leftist individuals are happier to pay taxes.

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A Appendix

Table A.1: Effects using different income polynomials

Income polynomial	Order 1		Order 2		Order 3		Order 4		Order 5		Order 6		Order 7		Order 8		Order 9		Order 10	
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
netincpoly1	0.568***		0.956***		1.432***		2.089***		2.639***		3.305***		4.090***		4.699***		3.965***		5.182***	
	(0.096)		(0.073)		(0.114)		(0.119)		(0.148)		(0.189)		(0.262)		(0.322)		(0.251)		(0.367)	
netincpoly2			-0.103***		-0.557***		-1.469***		-2.509***		-4.103***		-6.596***		-8.915***		-5.907***		-10.739***	
			(0.023)		(0.100)		(0.131)		(0.218)		(0.355)		(0.653)		(0.940)		(0.572)		(1.160)	
netincpoly3					0.040***		0.252***		0.756***		1.949***		4.731***		8.116***		3.154***		10.375***	
					(0.008)		(0.031)		(0.099)		(0.239)		(0.637)		(1.163)		(0.417)		(1.495)	
netincpoly4							-0.012***		-0.087***		-0.408***		-1.662***		-3.839***		0.000		-4.207***	
							(0.002)		(0.015)		(0.062)		(0.267)		(0.679)		(0.000)		(0.728)	
netincpoly5									0.003***		0.038***		0.289***		0.971***		-0.577***			
									(0.001)		(0.007)		(0.051)		(0.200)		(0.106)			
netincpoly6											-0.001***		-0.024***		-0.132***		0.212***		0.550***	
											(0.000)		(0.005)		(0.031)		(0.042)		(0.115)	
netincpoly7													0.001***		0.009***		-0.033***		-0.184***	
													(0.000)		(0.002)		(0.007)		(0.041)	
netincpoly8															-0.000***		0.002***		0.027***	
															(0.000)		(0.001)		(0.006)	
netincpoly9																	-0.000***		-0.002***	
																	(0.000)		(0.000)	
netincpoly10																			0.000***	
																			(0.000)	
marketincpoly1		0.199***		0.508***		1.120***		1.820***		2.356***		3.180***		4.130***		4.974***		5.769***		6.401***
		(0.039)		(0.052)		(0.079)		(0.108)		(0.132)		(0.178)		(0.229)		(0.263)		(0.356)		(0.430)
marketincpoly2				-0.060***		-0.402***		-1.046***		-1.729***		-3.100***		-5.107***		-7.225***		-9.655***		-11.904***
				(0.010)		(0.036)		(0.080)		(0.133)		(0.239)		(0.391)		(0.501)		(0.873)		(1.195)
marketincpoly3						0.028***		0.184***		0.467***		1.296***		2.957***		5.155***		8.326***		11.893***
						(0.003)		(0.019)		(0.051)		(0.134)		(0.299)		(0.439)		(1.015)		(1.620)
marketincpoly4								-0.009***		-0.050***		-0.252***		-0.854***		-1.911***		-3.921***		-6.781***
								(0.001)		(0.007)		(0.032)		(0.106)		(0.189)		(0.604)		(1.170)
marketincpoly5										0.002***		0.022***		0.125***		0.383***		1.058***		2.326***
										(0.000)		(0.003)		(0.018)		(0.042)		(0.196)		(0.485)
marketincpoly6												-0.001***		-0.009***		-0.042***		-0.168***		-0.495***
												(0.000)		(0.001)		(0.005)		(0.036)		(0.120)
marketincpoly7														0.000***		0.002***		0.015***		0.066***
														(0.000)		(0.000)		(0.004)		(0.018)
marketincpoly8																-0.000***		-0.001***		-0.005***
																(0.000)		(0.000)		(0.002)
marketincpoly9																		0.000***		0.000***
																		(0.000)		(0.000)
marketincpoly10																				-0.000***
																				(0.000)
log total taxes	0.074***	0.074***	0.056***	0.035***	0.045***	-0.011	0.035***	-0.046***	0.030***	-0.063***	0.026***	-0.081***	0.024***	-0.094***	0.024***	-0.102***	0.024***	-0.106***	0.023**	-0.108***
	(0.010)	(0.011)	(0.009)	(0.011)	(0.009)	(0.012)	(0.009)	(0.012)	(0.009)	(0.013)	(0.009)	(0.013)	(0.009)	(0.013)	(0.009)	(0.013)	(0.009)	(0.013)	(0.009)	(0.013)
controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.258	0.256	0.259	0.257	0.260	0.259	0.261	0.260	0.261	0.260	0.261	0.261	0.262	0.261	0.262	0.262	0.262	0.262	0.262	0.262
Observations	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

Table A.2: Mean values by income quintiles

	life satisfaction	net income	gross income	total taxes	working hours
quint1	7.63	1298	1811	512	23.5
quint2	7.99	1934	2777	843	27.9
quint3	8.07	2361	3513	1151	32.4
quint4	8.21	2903	4473	1571	35.8
quint5	8.43	4523	7481	2957	38.9
total	8.07	2604	4010	1407	31.7

Table A.3: Mean values by skill level

	life satisfaction	net income	gross income	total taxes	working hours
high skilled	8.20	3379	5311	1932	36.5
medium skilled	8.03	2392	3651	1259	31.5
low skilled	7.94	1958	2947	989	23.0
total	8.07	2604	4010	1407	31.7

Table A.4: Mean values by East/West

	life satisfaction	net income	gross income	total taxes	working hours
west	8.20	2709	4188	1479	30.9
east	7.57	2195	3323	1128	35.1
total	8.07	2604	4010	1407	31.7

Table A.5: Mean values by political preferences

	life satisfaction	net income	gross income	total taxes	working hours
rightist	8.05	2554	3935	1381	31.4
leftist	8.13	2752	4238	1486	32.8
total	8.07	2604	4010	1407	31.7

Table A.6: Effects on life satisfaction - by estimator

Estimator	OLS			Fixed Effects			Quasi FE			Ordered Probit		
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
log net income	0.401***	0.370***		0.270***	0.237***		0.298***	0.263***		0.278***	0.255***	
	(0.011)	(0.014)		(0.021)	(0.022)		(0.014)	(0.015)		(0.008)	(0.010)	
log gross income			0.599***			0.411***			0.453***			0.417***
			(0.019)			(0.031)			(0.022)			(0.014)
log total taxes		0.036***	-0.164***		0.055***	-0.079***		0.055***	-0.095***		0.026***	-0.114***
		(0.009)	(0.013)		(0.012)	(0.017)		(0.009)	(0.013)		(0.006)	(0.009)
controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.263	0.263	0.264	0.226	0.226	0.226	0.293	0.293	0.294	0.083	0.083	0.083
Akaike IC	405847	405828	405728	337118	337075	337025	.	.	.	384907	384887	384775
Observations	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088	113088

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

Table A.7: Effects on life satisfaction, separately by household type

	Singles			Couples		
Model	(1)	(2)	(3)	(4)	(5)	(6)
log net income	0.215***	0.184***		0.359***	0.339***	
	(0.030)	(0.029)		(0.015)	(0.018)	
log gross income			0.476***			0.489***
			(0.054)			(0.024)
log total taxes		0.104***	-0.070**		0.029***	-0.115***
		(0.018)	(0.029)		(0.011)	(0.015)
controls	Yes	Yes	Yes	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted/Pseudo R^2	0.275	0.276	0.277	0.296	0.296	0.296
Observations	26136	26136	26136	86952	86952	86952

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

Table A.8: Effects on life satisfaction - by sharing rule

Data	100 pc public			100 pc private		
Model	(1)	(2)	(3)	(4)	(5)	(6)
log net income	0.294***	0.259***		0.294***	0.259***	
	(0.014)	(0.016)		(0.014)	(0.016)	
log gross income			0.448***			0.447***
			(0.022)			(0.022)
log taxes		0.054***	-0.095***		0.054***	-0.094***
		(0.009)	(0.013)		(0.009)	(0.013)
controls	Yes	Yes	Yes	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.293	0.294	0.294	0.293	0.294	0.294
Observations	113088	113088	113088	113088	113088	113088

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

Table A.9: Results by satisfaction measure

Data	Life satisf.		Financial satisf.	
Model	(1)	(2)	(3)	(4)
log net income	0.298***		0.976***	
	(0.015)		(0.026)	
log gross income		0.504***		1.634***
		(0.021)		(0.027)
log total taxes	0.053***	-0.114***	0.222***	-0.316***
	(0.009)	(0.013)	(0.013)	(0.017)
controls	Yes	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	0.257	0.258	0.261	0.264
Observations	113088	113088	112774	112774

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

Table A.10: Effects on life satisfaction: net vs. disposable income

Model	(1)	(2)	(3)	(4)
log net income	0.336***	0.298***		
	(0.013)	(0.015)		
log disposable income			0.294***	0.259***
			(0.014)	(0.016)
log total taxes		0.053***		0.054***
		(0.009)		(0.009)
controls	Yes	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	0.257	0.257	0.293	0.294
Observations	113088	113088	113088	113088

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).

Table A.11: Effects on life satisfaction - by health measures

Health measure	Subjective health		Satisf. with health		Doctoral visits p.a.	
Model	(1)	(2)	(3)	(4)	(5)	(6)
log net income	0.258***		0.274***		0.332***	
	(0.017)		(0.015)		(0.017)	
log gross income		0.453***		0.464***		0.566***
		(0.023)		(0.021)		(0.023)
log total taxes	0.044***	-0.111***	0.049***	-0.105***	0.052***	-0.136***
	(0.010)	(0.015)	(0.009)	(0.013)	(0.010)	(0.014)
controls	Yes	Yes	Yes	Yes	Yes	Yes
year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.246	0.247	0.287	0.288	0.089	0.091
Observations	89145	89145	113088	113088	106862	106862

Note: Robust standard errors in parentheses. All money variables are in 2010 euros. Significance levels are 0.1 (*), 0.05 (**), and 0.01 (***).