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Tax simulation in the SHP

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by

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Abstract

This paper describes a simulation package designed to estimate the annual income taxes paid by respondents of the Swiss Household Panel (SHP). In Switzerland, the 26 cantons have their own tax system. Additionally, tax levels vary between the over 2000 municipalities and over time. The simulation package takes account of this complexity by building on existing tables on tax levels which are provided by the Swiss Federal Tax Administration Office. Because these are limited to a few types of households and only 812 municipalities, they have to be extended to cover all households and municipalities. A further drawback of these tables is that they neglect several deductions. The tax simulation package fills this gap by taking additionally account of deductions for children, double-earner couples, third pillar and support for dependent persons according to cantonal legislation. The resulting variable on direct taxes not only serves to calculate household income net of taxes, but can also be a variable for analysis by its own account.

1 Introduction

Net household income, where direct taxes for the government have been deducted, is an important variable for the assessment of the financial situation of households or individuals and particularly suited for international comparisons. This implies that taxes paid by households have to be measured or simulated. Besides being a prerequisite for the calculation of net household income, information on taxes paid is critical for studying the income distribution, poverty and the effects of tax and transfer programs (redistribution).

Household income net of taxes is a variable included in the Cross National Equivalent File (CNEF) of different household panels. Within the CNEF-project, the SHP had to develop and implement a strategy how to construct a variable indicating (personal and) household taxes that is compatible with information on income. Simulating income in Switzerland is complicated by the fact that there are 26 different tax systems (according to cantons) and tax levels vary between the ca. 3000 political municipalities.

This paper describes a simulation package designed to estimate the annual income taxes paid by respondents of the Swiss Household Panel (SHP) at the federal, cantonal and municipal level. The paper is structured in the following way: Section two briefly informs about the Swiss fiscal system in Switzerland. The particularity of the system lies in its federal structure. Section three presents the information on income and taxes available in the SHP. Section four then discusses different alternatives for the construction or simulation of household taxes in order to justify the final strategy adopted. This final strategy is then presented in detail in section five. This paper is restricted to taxes on income and thus not includes taxes on wealth. This is due to the fact that in the SHP so far, no information on wealth is available for waves 1 to 10. From wave 11 on, estimation on wealth has been included in the household-questionnaire.

Variables on simulated taxes are available in the CNEF-version of the SHP or are sent to researchers upon demand.¹

Finally, a few words on the terminology used within this paper seem necessary. As *net income* we refer to income after deduction of (income) taxes and social security contributions.² *Gross income* is the total of all income sources before deductions of social security contributions and taxes. As *taxable income* we refer to gross income minus deductions allowed according to the tax system (e.g. social security contributions, deductions for children). *Tax units* are either individuals (from 18 years on) or married couples

2 Fiscal system in Switzerland

Generally, everybody who lives and works in Switzerland is liable for the taxation of his income and assets. The fiscal system in Switzerland is based on the Swiss federalism and thus has three fiscal sovereignties. This means that the Swiss citizens contribute to the federation, the cantons (26 cantons) and municipalities (2721 municipalities at January 1st 2007).

¹ Email to ursina.kuhn@fors.unil.ch

² Social security contributions deducted from salary include state old-age pension (AHV/AVS), private pension plans, invalidity insurance, unemployment insurance, accident and mortality insurance.

At the Federal level, direct income taxes make up only about 26 percent of total income of the federal government, with the rest including indirect value-added taxes, withholding tax on interest received, petroleum tax, customs and other taxes.

Cantons and municipalities receive the major part of income taxes paid by individuals. They raise not only taxes on income, but also on fortune, inheritance, capital and property gains and other taxable objects. Each of the 26 cantons has its own fiscal system. This implies that tax levels, progression and deductions vary strongly among the 26 cantons. Most of the cantons have a progressive tax system, what means that the tax rate becomes automatically higher, when the income increases. For the ca. 3000 municipalities, the respective cantonal tax system is applied, but municipalities remain generally free to set their tax rates or establish new taxes, on condition that the competent canton gives its authorization. As a result of this federal fiscal system there is a quite intense tax-competition between cantons as well as between municipalities.

Generally the income of a person is taxed according to its marital status; the income from husband and wife for example is aggregated and taxed together. Tax units are thus either individuals or married couples.

3 Measurement of income and taxes in the SHP

In the individual questionnaire of the SHP, each respondent is questioned about income from a series of income sources. Sources include income from employment, self-employment, old-age insurance, private pension plan, invalidity insurance, social assistance, unemployment, grant, family allowances, other institutions, private persons outside of the household, other persons within the household and other income sources.³ Each respondent is asked whether he or she received income from these sources since the interview of the preceding wave or – if the person has not participated in the preceding wave – in the last 12 month. After each affirmation for an income source, respondents are then asked to indicate the amount received. They can either report monthly or yearly amounts or one-off payments and they can report either gross or net amounts. If respondents did not report the amount of any source they received income from, they are also asked about total income taking all sources together. Using standard assumptions regarding social security contributions, both net and gross income are calculated for the SHP user files. These files contain constructed variables on yearly income for each income source and for total income.

In the household questionnaire, the reference persons are asked to indicate total household income of all individuals in the household taken together, but no further distinction between different income sources is made. For the SHP user-file, variables on yearly (gross and net) household income are constructed. In three cases, household income is constructed at the basis of information from the individual questionnaires: Firstly for one-person households (where household income is not even asked), secondly for households where total income amounts of all individuals in the household are known and thirdly for households where the sum of individual incomes exceeds the household income indicated.

³ From 1999-2003, some of these sources have been grouped together (cf. Kuhn, Ursina (2008). Collection, construction and plausibility checks of income data in the Swiss Household Panel. Working Paper 1_08, Swiss Household Panel, FORS.)

With regard to taxes, the SHP has so far not provided information on direct income taxes at the individual level. But at the household level, reference persons are asked in the household-interview about total amount of taxes paid by the household. This question is however not restricted to income taxes. Note that in the variables on “net incomes” provided in the SHP user files, direct taxes have not been deducted.

4 Strategies to obtain information on taxes paid

There are different ways how tax-amounts can be obtained. The – at first sight – simplest strategy would be to rely on total household indicated by the reference person in the household questionnaire of the SHP. Because there are several problems with this option we have to consider alternatives. One is to simulate taxes individually for each household according to tax legislation. Another is to rely on tax simulations already established by others. Because these have substantial drawbacks, we will rely on a solution which parts from existing estimates and extends them to be applicable to the SHP-data. In the following, we will briefly present each strategy and discuss its advantages and disadvantages.

4.1 Self-reported taxes and CNEF variables on income

The variable on household taxes is needed to calculate net household income. It is therefore crucial that the tax amount is somehow related to the household income. There are several reasons why the self-reported tax amount might be incompatible to the household income. Firstly, we cannot know whether the reference-person indeed takes account of the taxes of all household-members (e.g. also of children) and how precise the estimation is. Secondly, the question wording about taxes paid at the household level does not refer to income taxes only, but rather to all taxes including taxation on wealth. A third problem arises because information on income amounts in the CNEF variables has been collected or imputed at the individual level, while taxes are given at the household level by the reference person. The CNEF-variables on income refer – with the exception of labour income – uniquely to the household level. However, these variables are all constructed by summing the income sources of the individuals in the household. Missing income sources have been imputed at the individual level for both item- and unit- non response. As a consequence, the total household income obtained by summing all (reported or imputed) individual income sources, might not be correctly related with total taxes indicated in the household questionnaire.

Because of all these reasons, subtracting household taxes from total income (as constructed for the CNEF file) does not result in a reliable measure of net income. Apart from this compatibility problem, self-reported tax variables have many missing values and would need to be imputed in any case.

4.2 Direct calculation for each tax unit

A tax simulation parts from total income and then estimates percentages of total income that have to be paid as (direct) taxes. A tax simulation should preferably be carried out at the unit of tax-units, which are either individuals or married couples. As with income variables in the CNEF-files, these simulated tax-amounts are then aggregated to the household level. The construction of a model that simulates taxes to be paid for each tax unit implies the following steps

- Taxable income: Construct 26 models (for each canton) for tax-deductions in order to simulate taxable income.
- Cantonal taxes: construct 26 models (for each canton) that simulate cantonal taxes at the basis of taxable income.
- Municipal taxes: construct 26 models (for each canton) that simulate municipal taxes at the basis of taxable income. This includes finding out the tax level of each of the ca. 3000 municipalities.
- Federal taxes: one model fitting all households

Because this information would have to be collected separately for each year and involves detailed knowledge of each cantonal tax system, a direct calculation of taxes would be very costly.

4.3 Already available models

4.3.1 *Tax calculators available on the internet*

There are some tax calculators available from the internet that simulate tax levels for each municipality. Advantages of such calculators are that taxes can be simulated for each municipality and take account of a series of deductions. In addition, they are very easily applied. Disadvantages are firstly that it remains unknown how taxes are simulated exactly, because the syntax is not openly available. Secondly, many deductions (such as 3rd pillar), age-dependence of child deductions, double income deductions are usually not taken into account. Because the syntax is not available, it is unknown which deductions have been considered. Thirdly, such systems are usually only able to simulate taxes for the current period. For the data of the SHP, we need to be able to simulate taxes for all years from 1999 on.

4.3.2 *Swiss Federal tax administration office (SFTA)*

The Swiss federal tax administration office (SFTA) provides tables on (direct) tax-burden at the municipal, cantonal and federal level. This information is provided for

- 18 income levels,
- 4 standard types of households (single adult with income from work, married couple with no children and working income, married couple with two children and income from work, married retired couples),
- 812 Swiss municipalities (large municipalities),
- years from 2000 on.

Total tax burden (of direct taxes) can be simulated by adding federal taxes to communal and cantonal taxes. Taxes for the Catholic Church are assumed and included. The models take account of the following deductions (based on assumptions): job related expenditures that can be applied without further justification (lump-sum deductions), insurance costs and interests saving accounts.

Disadvantages of the SFTA-models are firstly that many households do not fit into one of the four standard types. This particularly applies household with children, because only a model

for households having two children below 18 years is available. Secondly, tax levels for households living in other than the 812 municipalities are missing. Finally, many deductions are not included into the models (3rd pillar, age and educational status of children, care of elderly or handicapped...). In the SHP, we have much more information on whether such deductions would apply or not. Not taking account of these deductions results in an overestimation of taxes which have to be paid.

The tables of the SFTA are a good starting point for the simulation of taxes. The model however has to be developed further in order to take account of the whole sample in the SHP, so that all household-types and all municipalities can be considered. Such a model should equally account for eligible deductions as far as possible.

4.4 Combining SFTA models and individual assignment of taxes

In a first step, we have to calculate taxable income that takes account of deductions we have information on. This involves constructing 26 algorithms, one for each canton. In a second step taxes are estimated at the basis of taxable income, where we rely on information of the Swiss Federal tax administration office (SFTA) as far as possible. However, information for many households in the SHP is missing:

- 1) Percentages are provided for four standard types of households (e.g. no information for households with 1 child or more than 2 children),
- 2) Percentages are provided for 812 municipalities (→ no information for each household living in another than these 812 municipalities).

To account for the shortcomings, we have to apply the following corrections and extensions:

- Take account of more deductions (as far as we know that households are eligible),
- Assign each household of the SHP to one of the standard types of households. Particularly households with children are problematic here, because there models include either married couples with no children or married couples with two children,
- Impute tax levels for municipalities not covered in the SFTA models.

The SFTA provides the percentage of taxes to be paid for different levels of gross income. We therefore subtract the additional deductions from the gross income. The basis to assign taxes is thus not exactly gross income (as in the SFTA models) but rather gross income minus deductions not considered in the SFTA model. Also deductions for children are simulated and deducted from household income. Then, tax percentages for married couples without children are applied. This procedure is presented in more detail in the next section.

5 Steps taken to estimate individual and household taxes

5.1 Gross income of tax units in SHP

- Starting point: individual total gross income in SHP (constructed for the SHP user file at the basis of the individual questionnaire or imputed for the CNEF variables). This corresponds to the sum of gross income from labour, from old-age pension, invalidity pension, private pension plan, income from unemployment insurance, from social institutions, from scholarships, from private individuals, family allowances and income from other sources, such as interests on wealth. Imputed values are taken

whenever an income source is missing. Also income from individuals who did not respond to the individual questionnaires (unit non-response) has been imputed.

- Convert income of individuals to income of tax units. For non-married person this implies no changes. However, for married partners living in the same household, the two incomes are added because married couples represent one tax-unit.

5.2 Select tax model to apply

- Tax burden provided by the SFTA: percentage of gross income of tax units that has to be paid for cantonal and municipality taxes
- We take account of three different models provided by the SFTA, which assume standard deductions: economically active single person, married couples, retired person.⁴ Each tax unit in the SHP is assigned to one of these models.

Assumptions and algorithms are described in more detail in Appendix A.

5.3 Simulate taxable income (deductions)

Apart from the standard deductions already in the SFTA tables (job related expenditures that can be applied without further justification, insurance costs and interests saving accounts), we take account of other deductions. We subtract these from the gross income, which results in a pseudo-taxable income. These additional deductions include the following if applicable:

- Deductions for children (depending on number of children and characteristics of children such as age and education status) according to cantonal legislation. Details for each canton are presented in Appendix B.
- Deductions for amounts paid to children not in households (aliments for children living with a former partner, support for children living outside of the household and being in education) according to cantonal legislation and where this is observable in the SHP.
- Deductions for support for elderly and handicapped where this is observable in the SHP (see Appendix C for details).
- Deductions for married couples where both have a labour income (double income deduction) according to cantonal legislation (cf. Appendix D for details).
- Church taxes (Catholics are assumed in the SFTA model, so taxes have to be adjusted if respondent/s is not a church member).
- Deduction for 3rd pillar (cf. Appendix E for details).

There are other important deductions which we can however not consider because information in the SHP is not sufficient:

⁴ There is a fourth model available for married couples with 2 kids. We need however the possibility to simulate income also for families with a different number of children. Additionally, deductions for children depend on age and other characteristics of children which vary between cantons, and do not apply to the standard scenario provided by the SFTA.

- Employment (or self-employment) related deductions can vary considerably, especially for travel expenses and if an additional apartment or room has to be rented. We do however not have information on such costs, so just standard deductions (as already included in the SFTA models) are assumed.
- Health expenditures (if above 15 percent of taxable income).
- For owner-occupiers of houses, costs for mortgages and renovations can be deducted from income. However also money saved because no rent has to be paid, have to be added to the income. We neither consider this imputed rent nor deductions relevant for owner occupiers in the estimation of taxes.
- Taxes for wealth are not considered.
- Deductions for debts.

5.4 Apply SFTA-model to taxable income

- We do not apply the original gross income, but the gross income minus additional deductions (“pseudo” taxable income as presented in 4.3) in the SFTA-table to find the percentage of that income which has to be paid for communal and cantonal taxes.
- This percentage is found according to income level and the community for each tax unit in the SHP.
- Information is only included for 812 municipalities. For the SHP-data, this means that we can simulate taxes for 80% of the individuals (data for 2007). 20% of individuals live in municipalities, which are not included in the SFTA-tables.
- For those households we have two possibilities:
 1. Check tax level in that particular community on lists provided by the cantons and apply the tax calculation for another community with the same tax level.
 2. Assume a particular tax level and tax level of an average community in the canton.

For cantons in which tax information for many households in the SHP are missing (precisely the cantons ZH, AG, TI, VD, BE) we adopt strategy 1. For the other cantons, we assume tax level of the cantonal capital according to strategy 2.

6 Output, descriptive statistics

Unlike most publications on tax levels in Switzerland, this approach of simulating taxes does not compare the tax-level of a hypothetical individual or family in different institutional settings, but refers to actual residents and takes account of the various municipal tax-levels and household-situations.

6.1 Percentages of gross income to be paid in taxes

According to taxes simulated for the SHP-data in 2007, percentages of gross income to be paid as direct taxes on the municipal, cantonal and federal level vary between 0 and 40 percent. The median tax-rate is 10.6 percent and the mean tax rate at 10.9 percent. Figure 1 shows the relationship between gross income and simulated tax percentages.

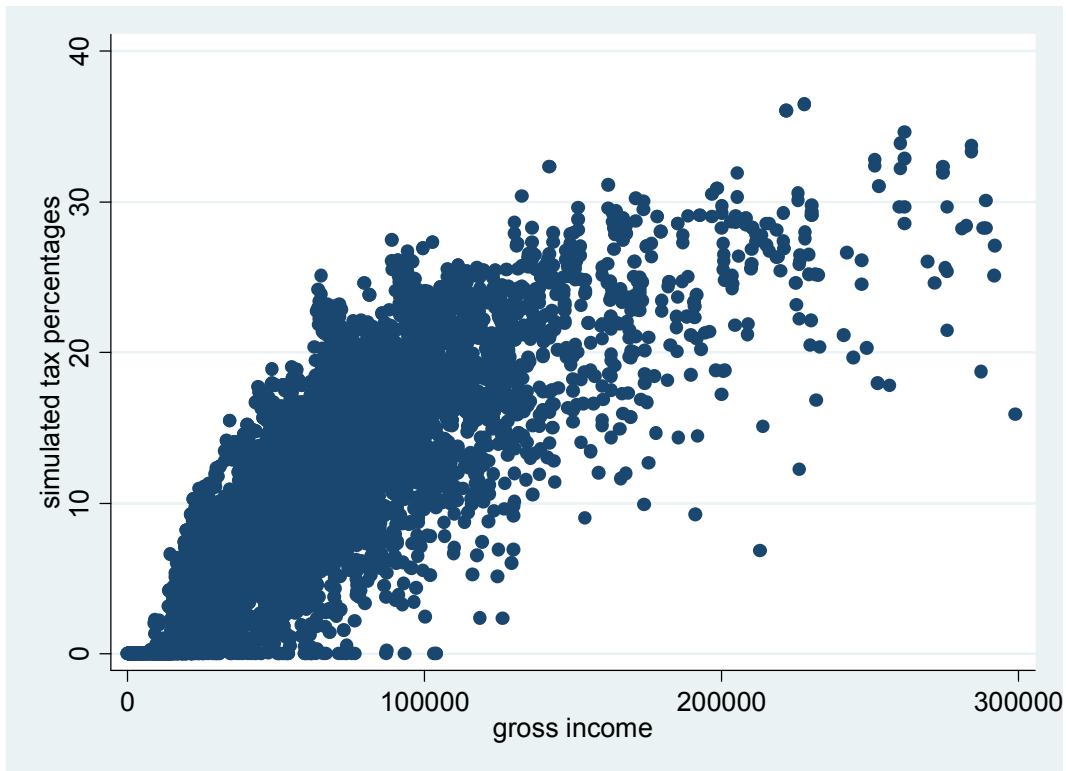


Figure 1 : Scatterplot of gross income and simulated tax percentages

Mean tax-levels presented in Table 1 vary strongly between cantons, with the lowest average tax level in the canton of Zug (6.1 percent) and Uri (6.2 percent) and the highest in the canton Jura (14.4 percent) and Neuchatel (13.4 percent). Variation in tax levels is lowest in Zug, Schwyz and Obwalden and highest in Basel-town and Geneva. Differences do not only reflect differences in tax systems, but also differences in income levels and household types.

| canton07 | p5 | p25 | p50 | p75 | p95 | mean | sd | N |
|----------|-----|-----|------|------|------|------|-----|------|
| AG | 0.0 | 4.0 | 10.4 | 15.7 | 22.5 | 10.3 | 7.5 | 594 |
| AI | 0.0 | 6.9 | 8.9 | 14.0 | 22.2 | 9.7 | 6.7 | 10 |
| AR | 0.0 | 6.3 | 10.5 | 15.4 | 24.3 | 10.8 | 6.8 | 48 |
| BE | 0.0 | 6.7 | 11.9 | 17.4 | 25.6 | 11.8 | 7.9 | 824 |
| BS | 0.0 | 3.7 | 13.3 | 18.3 | 26.8 | 12.0 | 8.6 | 108 |
| BL | 0.0 | 4.4 | 10.4 | 16.9 | 23.2 | 10.6 | 7.8 | 248 |
| FR | 0.0 | 5.8 | 11.6 | 16.3 | 23.2 | 11.1 | 7.2 | 251 |
| GE | 0.0 | 0.0 | 8.6 | 15.0 | 22.6 | 8.9 | 8.2 | 269 |
| GL | 0.0 | 3.9 | 10.7 | 13.5 | 21.6 | 9.6 | 6.4 | 35 |
| GR | 0.0 | 4.2 | 9.0 | 14.2 | 20.7 | 9.3 | 6.9 | 151 |
| JU | 8.6 | 9.6 | 13.1 | 19.8 | 25.5 | 14.4 | 5.5 | 14 |
| LU | 0.0 | 6.0 | 10.9 | 13.9 | 21.4 | 10.1 | 6.7 | 377 |
| NE | 0.0 | 7.9 | 15.1 | 19.5 | 25.0 | 13.4 | 7.9 | 289 |
| NW | 0.0 | 6.4 | 10.8 | 14.0 | 19.3 | 10.6 | 5.3 | 35 |
| OW | 0.0 | 6.6 | 10.6 | 13.2 | 18.4 | 9.7 | 5.1 | 39 |
| SG | 0.0 | 4.9 | 11.3 | 15.7 | 23.4 | 10.8 | 7.6 | 417 |
| SH | 0.0 | 3.8 | 10.4 | 16.2 | 21.0 | 10.2 | 7.1 | 60 |
| SO | 0.0 | 7.5 | 12.9 | 17.5 | 25.3 | 12.3 | 7.5 | 253 |
| SZ | 0.0 | 3.3 | 6.5 | 9.1 | 15.8 | 6.7 | 5.0 | 117 |
| TG | 0.0 | 2.6 | 10.0 | 14.3 | 20.3 | 9.5 | 6.9 | 152 |
| TI | 0.0 | 0.7 | 5.3 | 10.6 | 20.3 | 6.8 | 6.7 | 225 |
| UR | 0.0 | 0.1 | 5.1 | 11.0 | 15.6 | 6.2 | 5.9 | 24 |
| VD | 0.0 | 0.8 | 10.3 | 15.6 | 21.5 | 9.4 | 7.8 | 650 |
| VS | 0.0 | 4.8 | 9.3 | 15.9 | 22.0 | 9.8 | 7.3 | 246 |
| ZG | 0.0 | 2.2 | 5.8 | 9.2 | 14.6 | 6.1 | 4.8 | 86 |
| ZH | 0.0 | 4.9 | 8.9 | 13.3 | 20.2 | 9.3 | 6.4 | 1236 |
| Total | 0.0 | 4.1 | 10.1 | 15.3 | 22.8 | 10.2 | 7.4 | 3758 |

Table 1: Tax levels by canton (percent of gross income): percentiles (p5, p25, p50, p75, p95), mean, standard deviation (sd), number of observations (N)

6.2 Comparison of reported and simulated taxes

In the Household-questionnaire of the SHP, one person of the household is asked to estimate the amount of direct taxes paid by the household. While these amounts refer to the household-level, simulated taxes refer to tax units. However, in the two following cases taxes of tax units and households are equal: firstly in single adult households and secondly in households with married couples (one tax unit) and no adult children. In these cases we will thus contrast self-reported taxes and simulated taxes.

For one person household the medium difference between self-reported taxes and simulated taxes is 0 (statistics for 2007, 1049 persons), on average taxes are however overestimated by 1049 CHF. Figure 2 shows the distribution (densities) of the self-reported and simulated percentages from gross income to be paid. It shows that for lower income, we slightly overestimate taxes and for higher income slightly underestimated (if self-reported taxes are correct). In the simulated data, taxes are thus more equal than for self-reported data. The correlation between the two measures is 0.26 (excluding households self-reporting a tax-level of over 40% of their income).

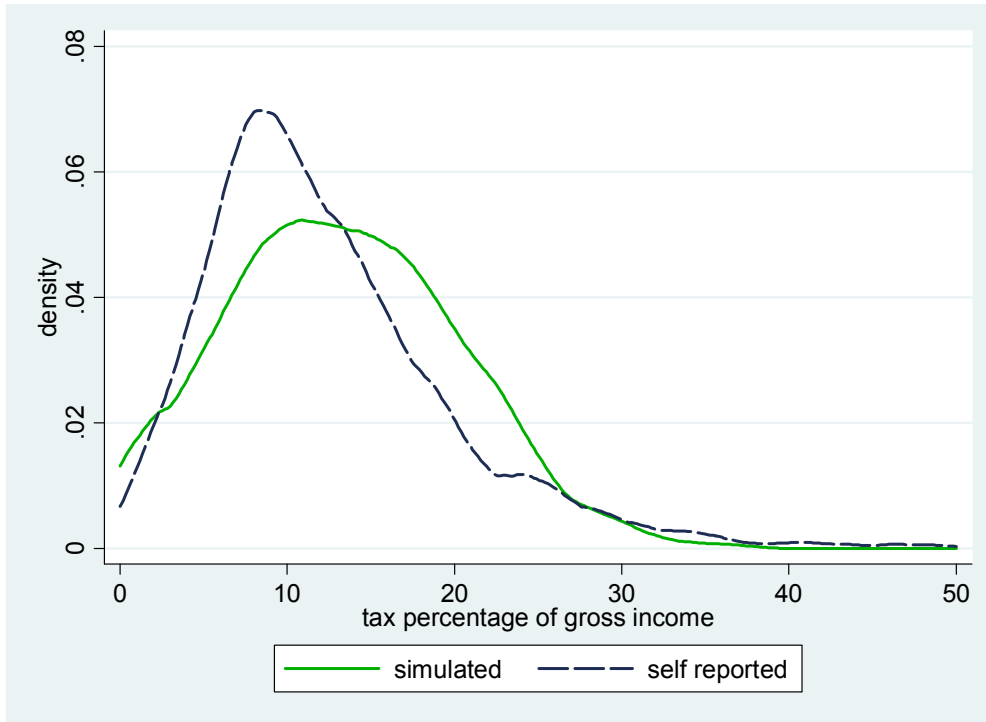


Figure 2: Taxes of one-person households as a percentage of gross income

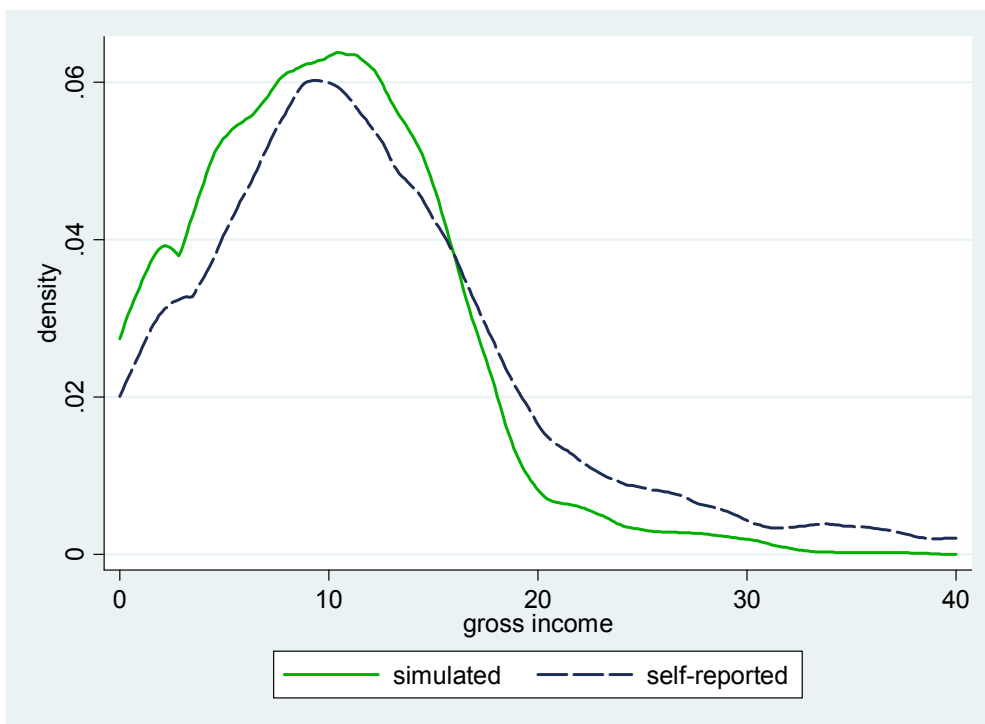


Figure 3: Taxes of married couples as a percentage of gross income

For married couples not living with other adults (one tax unit in the household), taxes of the median household are underestimated by 224 CHF, but are on average overestimated by 4124 CHF. Figure 3 shows the density distributions of simulated and self-reported income. The

variance in the two distributions is about equal. The correlation between the two measures amounts to 0.30.⁵

Different values for simulated and self-reported taxes do not necessarily imply that any of the two is false. There are many reasons of why self-reported and simulated tax might be different:

- Certain deductions are not taken account for the simulation of taxes.
- Assumptions taken to simulate taxes are not accurate.
- Self-reported taxes might include other taxes than income taxes (most likely wealth)
- The tax amount given might not correspond to the same time period as the income on which tax simulations are based. The income amount always refers to the year preceding the interview date.
- Self reported taxes are given independently of the (household income) and sometimes even exceed self-reported income, whereas simulated taxes are calculated at the basis of given (or imputed) income.
- Self-reported taxes might not correspond to actual taxes because of measurement errors, because respondents do not remember correctly, do misinterpret the questions or through coding errors.

For these reasons, it is difficult to assess the overall quality of the simulated taxes relative to the self-reported taxes, because we do not know which one is most accurate. Overall, properties of the simulated taxes however seem reasonable and are similar to self-reported taxes. But the usefulness and accuracy of simulated tax rates need to be tested also by application in data analyses.

The variable indicating tax amounts is not only a necessary element for the construction of net household income, which is particularly suited for comparative research, but might be interesting in its own account. It reflects not only the different tax systems in Switzerland, but takes account of the heterogeneity among households. One possible application would be to analyse how the tax system affects geographical mobility.

Variables containing the simulated taxes at the household level are part of the SHP-CNEF data. Additionally, they are sent to data users upon request.⁶

⁵ Households where self-reported taxes are higher than 40 percent of their income have been excluded.

⁶ Please email to ursina.kuhn@fors.unil.ch

Appendix: Rules and assumptions applied for taxable income

Appendix A Assignment of SFTA model to apply

As mentioned above, for each individual (or tax-unit) one of the models available from the SFTA is assigned. The model “married couple with no children and labour income” is applied to the following individuals:

- married civil status and spouse lives in the same household
- single parent (are taxed according to the same scale like married couples)

The model “married retired couple” is applied to the following individuals:

- both partners are over 65 years old
- one partner is over 65 years old and the other does not have an income from employment

For all other individual, the model “single adult with income from work” is applied.

Appendix B Deductions for children

General rules to simulate deductions for children

- Only children up to 40 years old living in the same household considered
- Necessary variables to simulate child deductions
 - o number of children
 - o age of each child
 - o education of each child (in education vs not in education, academic education vs other education (TI))
 - o income of children
- In education:
 - o occupa\$\$=2 (part-time paid work 5-36 h), occupa\$\$=3 (part-time paid work (1-4 h) or occupa\$\$=4 (in school, training, apprentice, pupil).
 - o If information on the grid level (variable occupa\$\$) contradicts information in the individual questionnaire, priority is given to information from the individual questionnaire in the following cases
 - According to occupa\$\$ the individual is not in education, but in the individual questionnaire the individual indicates to be currently in education (p\$\$e14>1)
 - According to occupa\$\$ the individual is in education, but in the individual questionnaire s/he indicates not to be in education (p\$\$e14=2)
 - o If a child already finished a first education (educat\$\$>8 & educat\$\$<11), is older than 18 years old and earns more than 40'000 CHF from employment, no deductions are considered for that child
 - o If a child earns over 100'000 CHF from employment, no deductions are considered for that child
- Calculations are based on own children living in the same household. For married couples, also additional children of the spouse are taken into account
- If parents of a child live together but are not married (and hence pay taxes separately), deductions for children can only be applied once. Deductions are assigned to the partner with the higher income in these cases.
- For variables that would have been necessary but are not available, we do have to assume their values
 - o geographic location of education of children (inside canton, outside canton, return home for meals, out of home during the week)
 - o children in education living outside the household

Rules by canton

Rules have to be adjusted for each year. The following table presents the rules according to cantonal legislation 2007. Rules and amounts however vary slightly by years.

| | |
|----|--|
| ZH | <ul style="list-style-type: none"> - 6800 per child from 0 to 18 years - 6800 per child from 18 to 26 years still in education - 700 CHF per child (0-18 years) for insurance premiums |
| BE | <ul style="list-style-type: none"> - 4400 per child from 0 to 18 years or being in education - CHF per child (0-18 years) for insurance premiums |
| LU | <ul style="list-style-type: none"> - 2500 per child from 0 to 18 years or being in education - 300 CHF per child (0-18 years) for insurance premiums |
| UR | <ul style="list-style-type: none"> - Assumption: up to 18 years meals at home, from 18 years on deductions for meals outside of home, children are assumed to live in the household (also during the week) - 6100 CHF per child from 0 to 18 years - 10100 CHF per child from 18 years on and in education |
| SZ | <ul style="list-style-type: none"> - 7500 per child from 0 to 18 years - 11500 per child from 18 years on and in education - 600 CHF per child (0-18 years) for insurance premiums |
| OW | <ul style="list-style-type: none"> - Assumption: up to 18 years not in professional education or university, child does not need to live outside of the household because of the education - 4000 CHF per child from 0 to 18 years - 5600 CHF per child from 18 years on and in education - 500 CHF per child (0-18 years) for insurance premiums |
| NW | <ul style="list-style-type: none"> - 5000 per child from 0 to 18 years or being in education - 300 CHF per child (0-18 years) for insurance premiums |
| GL | <ul style="list-style-type: none"> - 6000 CHF per child from 0 to 18 years or being in education - 600 CHF per child (0-18 years) for insurance premiums |
| ZG | <ul style="list-style-type: none"> - 8300 CHF per child from 0 to 18 years or being in education - 500 CHF per child (0-18 years) for insurance premiums |
| FR | <ul style="list-style-type: none"> - For first and second child between 5500 und 7000 CHF - From third child on : between 6500 and 8000 CHF - The exact amount depends on the income level. Above a critical amount, the deduction is reduced by 100 CHF for each 1000 CHF of income. The critical amount is 60'000 for one child and increases by 10'000 CHF for each additional child. - 700 CHF per child (0-18 years) for insurance premiums |
| SO | <ul style="list-style-type: none"> - 6000 CHF per child from 0 to 18 years or being in education - 300 CHF per child (0-18 years) for insurance premiums |
| BS | <ul style="list-style-type: none"> - 6800 CHF per child from 0 to 18 years or being in education |
| BL | <ul style="list-style-type: none"> - 5000 CHF per child from 0 to 18 years or being in education - 200 CHF per child (0-18 years) for insurance premiums |
| SH | <ul style="list-style-type: none"> - 6000 CHF für Kinder von 0 bis 18 Jahren oder in Ausbildung - 200 CHF per child (0-18 years) for insurance premiums |
| AR | <ul style="list-style-type: none"> - 4000 CHF per child in pre-school age (Assumption: below 6 years) - 5500 CHF per child in school or education - 500 CHF per child (0-18 years) for insurance premiums |
| AI | <ul style="list-style-type: none"> - 4000 CHF per child from 0 to 18 years or being in education - 500 CHF per child (0-18 years) for insurance premiums |

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| SG | <ul style="list-style-type: none"> - 4800 CHF per child from 0 to 18 years or being in education - 600 CHF per child (0-18 years) for insurance premiums |
| GR | <ul style="list-style-type: none"> - 5000 CHF per child in pre-school age (Assumption: below 6 years) - 8000 CHF per child being in education |
| AG | <ul style="list-style-type: none"> - 6400 CHF per child from 0-14 years - 8000 CHF per child from 14 to 18 years - 95CHF per child from 18 years and in education |
| TG | <ul style="list-style-type: none"> - 7000 CHF per child from 0-16 years - 8000 CHF per child from 16 to 20 years and in school or education - 10'000 CHF per child from 20 to 26 years and in school or education - 200 CHF per child (0-18 years) for insurance premiums |
| TI | <ul style="list-style-type: none"> - 10900 CHF per child from 0 to 18 years or being in education - Additionally 1200 CHF per child non-academic but post-compulsory education (Assumption: education is in canton TI) - Additionally 6200 CHF per child academic education (Assumption: education is in canton TI) |
| VD | <ul style="list-style-type: none"> - System with income quotient (takes account of civil status and number of children). We therefore apply the tax model for non-married persons for each tax unit. - 1200 CHF per child (0-18 years) for insurance premiums - From legislation : <ul style="list-style-type: none"> o système du quotient familial. Il consiste à cumuler les revenus des conjoints, dont le total est ensuite divisé par 1.8 pour le couple et 0.5 par enfant. Ainsi, un couple avec deux enfants est imposé à un taux correspondant à son revenu total divisé par 2.8. o Un correctif a été apporté: le quotient familial a été "plafonné" en 2006 (art. 43 LI). Désormais, au-dessus d'un revenu imposable de CHF 180.000.-, la part de 0,5 par enfant est accordée une seule fois (ce montant de CHF 180.000.- est toutefois augmenté de CHF 20'000 par enfant supplémentaire). |
| VS | <ul style="list-style-type: none"> - 4260 CHF for children from 0-6 years - 5330 CHF for children from 6-16 years - 6400 CHF for children from 6-18 years or above 18 years and in education - 310 CHF per child (0-18 years) for insurance premiums |
| NE | <ul style="list-style-type: none"> - 5500 CHF for 1. child 0-18 years old or in education - 6000 CHF for 2. child 0-18 years old or in education - 6500 CHF ab 3. child 0-18 years old or in education - 100 CHF per child (0-18 years) for insurance premiums |

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| GE | <ul style="list-style-type: none"> - Deduction on tax amount: <ul style="list-style-type: none"> o 6754 CHF for each child below 18 years and earning less than 14668 CHF o 3377 CHF for each child below 18 years and earning between 14668 and 22000 CHF o 6754 CHF for each child between 18 and 26 years and being in education and earning less than 14668 CHF o 3377 CHF for each child between 18 and 26 years and being in education and earning between 14668 and 22000 CHF - 750 CHF per child (0-18 years) for insurance premiums |
| JU | <ul style="list-style-type: none"> - 4600 CHF for first and second child from 0-18 years or being in education - 5200 CHF from 3rd child from 0-18 years or being in education on - 350 CHF per child (0-18 years) for insurance premiums |

Appendix C

Deductions for dependent persons (other than children)

- If in the household questionnaire, the reference person reports payments to persons not in the household, we assume that they are either for child allowances, for a former partner, for elderly, for handicapped or any other person so that the amount can be validly deducted from income
- Make sure that the amount is only deducted once in a household. If there are several tax units in the same household, the deduction is assigned to the one who contributes most to the household income (i§§i57a).
- Variables not available in the SHP and which are therefore not considered in the calculation: care for elderly living in the same household, number of supported persons, services to children and parents which are constantly in need of care (BE)

Appendix D

Deductions for double income

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| ZH | 5400 CHF |
| BE | 2%, maximum 8800 CHF |
| LU | 4200 CHF |
| UR | <ul style="list-style-type: none"> - 2000 if income from employment and self-employment is not higher than 15000 CHF. - If income from employment and self-employment is higher than 15000 CHF, total income of both partners is reduced by 35% of the smaller income. |
| SZ | 2000 CHF |
| OW | 1700 CHF for each partner |
| NW | 1000 CHF |
| GL | 10%, maximum 5000 CHF |
| ZG | maximum 4100 CHF |
| FR | 500 CHF |
| SO | 1 000 CHF |
| BS | 1100 CHF |
| BL | The total income of both partners is reduced by the smaller income, but by maximum 1000 CHF. |
| SH | 800 CHF |
| AR | 2400 CHF |
| AI | 500 CHF |
| SG | 500 CHF |
| GR | 3500 CHF |
| AG | 600 CHF |
| TG | - |
| TI | 7400 CHF |
| VD | 1600 CHF |
| VS | 5790 CHF |
| NE | 25%, maximum 1200 CHF |
| GE | Deduction of tax amount that corresponds to the amount that results when the personal deduction increased by 3640 CHF (5200 CHF if gross income of both partners is smaller or equal than 52000 CHF). |
| JU | 2400 CHF |

Appendix E Deductions 3rd pillar

- Deduct maximal amount for 3rd pillar if at least one person in the household has a third pillar (information from household questionnaire). The exact amount varies by year.
- If the reference person works full time (occupa\$\$=1), the deduction is made from their income
- If the partner of the reference person works full time, the deduction is made from their income
- If the partner doesn't work full time, the amount is deducted for reference persons working part time (occupa\$\$=2). If both partners work part time, the deduction is only made for the reference person.

Appendix F Taxes for church

- In the standard assumption of the SFTA, affiliation to the Roman Catholic Church is assumed
- In the example provided by the SFTA, taxes of the Catholic Church amount to 5 percent of taxes to be paid.
- We assume the same amount has to be paid for the Protestant and the Christian Catholic Church. For respondents not being affiliated to neither of these churches, we deduct 5 percent of the taxes to be paid.