

Personal Income Tax and gender

Marisa Bucheli Cecilia Olivieri



dECON

Facultad de Ciencias Sociales
UNIVERSIDAD DE LA REPÚBLICA

XIV Arnoldshain Seminar
5th October 2016

Outline of the presentation

- Introduction
- Traits of Uruguayan economy
 - A socio-economic gendered picture
 - The Personal Income Tax
- Data and methods
 - Data and imputations
 - Gendered classification of the population
 - Empirical strategy
- Results
 - A global incidence analysis
 - Exploring differences among households of workers
 - The burden tax of non-employed
- Conclusions

- Stotsky (1996):
 - Explicit bias: arises from the tax code, when it identifies and treats men and women differently
 - Implicit bias: provisions in the tax systems that tend to generate different incentives for men than for women, due to the culture or socioeconomic arrangements
- Many of the studies focused on the implicit bias under joint taxation:
 - Optimal taxation perspective: individuals with higher labor supply elasticity should be less taxed. (Alesina et al., 2011)
 - Gender equity perspective: joint taxation discourages the participation of married women in the labor market and men's participation in unpaid domestic work creating gender biases (Bach et al., 2013; Guner et al., 2011, Apps and Reese, 2010)
- Under the gender equity perspective: schedular income tax with individual filing (Apps and Reese, 2009)

- Motivated for several reasons, there has been a trend in developed countries to reform their PIT systems to dual regimes (that tax capital and labor separately) with individual filing (Genser and Reutter, 2007)
- However, gender bias may arise even under individual filing and a schedular system. For example, Rodriguez Enriquez et al. (2010) find a gender bias in Argentina because women are more prone to be employed in occupations that are taxed at lower rates than occupations intensive in men
- In Uruguay in 2007: dual tax with individual filing
- We use the Household Survey carried out in 2013 by the Statistical Office in Uruguay. Our unit of analysis is the household. We assess the effect of household type on the ratio PIT to income through the estimation of a zero-one inflated beta model (ZOIB)

- We are particularly interested in comparing PIT incidence in three typical cases:
 - a) households supported by a worker man who lives with a dependent housewife who is not engaged in paid employment
 - b) households in which both couple members work
 - c) households in which a single woman works

- We find that, given per capita income household, PIT incidence is higher for male breadwinner households, followed by dual earner households
- Following Elson (2006) and Grown (2010), we consider this result consistent with gender equality because it is in line with an equal gender time allocation within the family
- However, male breadwinner households also bear a higher incidence than female breadwinner households with a dependent spouse. This gender difference is originated in their different structure of income sources
- Finally, the female lone breadwinner type exhibits the lowest PIT incidence mainly because the high participation of non-taxed sources in their household income

- Implementation of a new strategy to analyze the data in the study of gender and taxation
- Presentation of evidence about the gendered impact of PIT in a developing country which recently passed a tax reform that follows the main guidelines of the regimes in advanced economies.

	Uruguay			Average of Latin American countries		
	All	Women	Men	All	Women	Men
Children per woman ^{a/}		2.04			2.14	
Life expectancy ^{a/}	77.0	80.5	73.3	74.8	78.1	71.5
Population older than 64 ^{b/ c/}	14.0	16.5	11.2	6.7	7.5	5.9
Years of education ^{b/ d/}	9.8	10.2	9.5	8.7	8.7	8.8
Participation rate ^{b/ c/ e/}	76.1	66.9	85.7	68.5	54.8	82.6
Households structure ^{b/ f/}						
One person households	21.9			11.0		
Couple family without children	17.2			9.0		
Couple family with children	33.2			39.9		
Lone-parent family	12.0			11.9		
Other households	15.7			28.2		
Notes: ^{a/} 2005-2010; ^{b/} 2010; ^{c/} Percentage of population; ^{d/} Population ages 25-59; ^{e/} Population ages 15-64; ^{f/} Percentage of households						

Main characteristics

- Individual filing system without explicit gender bias
- Dual tax:
 - Capital income is taxed at a flat rate
 - Labor income and pensions are subjected to progressive rates
- A relevant characteristic of the dual structure is that a flat rate on capital income eliminates the incentive for capital income splitting between the household members and the government incentive to rule on ownership and splitting (for pros and cons of dual income taxes, see Genser and Reutter, 2007)

Main characteristics

- The tax is equal to a primary tax minus tax credits
- Tax credits:
 - Contributions and taxes levied on labor income
 - A fix amount per child (with a higher level in case of disabled child) and mortgage payments when the house is used for permanent residence and its cost is lower than a threshold
- The tax credit for children can be distributed between parents
- When parents are divorced and they do not agree about this distribution, each one can deduct 50%
- In order to calculate the amount of the tax credit, a progressive rate schedule applies that range from 10% in the first bracket to 30% in the sixth
- After subtracting these tax credits, tenants are allowed to additionally subtract 6% of their rent

PIT burden by income for selected individual types

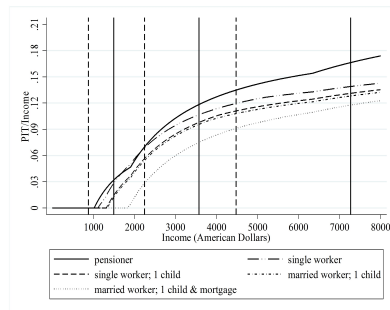
Pensioners: exempted up to around US\$ 1000 per month.

Workers: US\$ 900, but a single worker pays taxes only when the gross earnings exceeds US\$ 1100 because of tax credits.

20% of pensioners and 36.8% of workers paid the PIT in 2012 (Burdin et al., 2015).

Children: tax credits per child.

Married with children: rate of contributions to Health Fund vary.

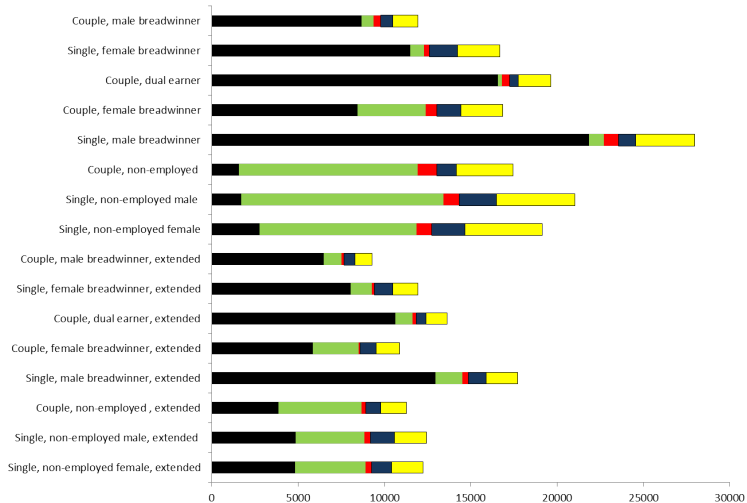


We overlapped dotted vertical lines at percentiles 75, 90 and 99 of the distribution of pensions meanwhile continuous lines indicate the same percentiles of the distribution of labor income

- Household Survey (ECH) of 2013 carried out by the Statistical Office (INE)
- It inquires income after taxes and contributions. We estimated taxes and contributions of employees using the statutory rates in force in 2013
- Capital income: we computed the taxable capital gains as the sum of the total amount of capital income sources. We assumed that there is no evasion and that conditions for deductions were no present
- Labor income: the ECH reports whether or not the worker contributes to the Social Security System. We assumed that there is no partial evasion of contributors whereas non-contributors do not pay contributions or taxes
- Credits: we considered contributions and children benefits, but we did not impute deductions related to mortgages and rents
- Credits for children were assigned to the head of the

Household Category	Weighted cases (%)
All population	100.0
Couple, male breadwinner	18.6
Single, female breadwinner	7.8
Couple, dual earner	30.6
Couple, female breadwinner	3.2
Single, male breadwinner	3.2
Couple, non-employed	7.0
Single, non-employed male	1.3
Single, non-employed female	6.1
Couple, male breadwinner, extended	4.0
Single, female breadwinner, extended	4.1
Couple, dual earner, extended	4.5
Couple, female breadwinner, extended	0.8
Single, male breadwinner, extended	1.7
Couple, non-employed , extended	2.2

Per capita income of households by source



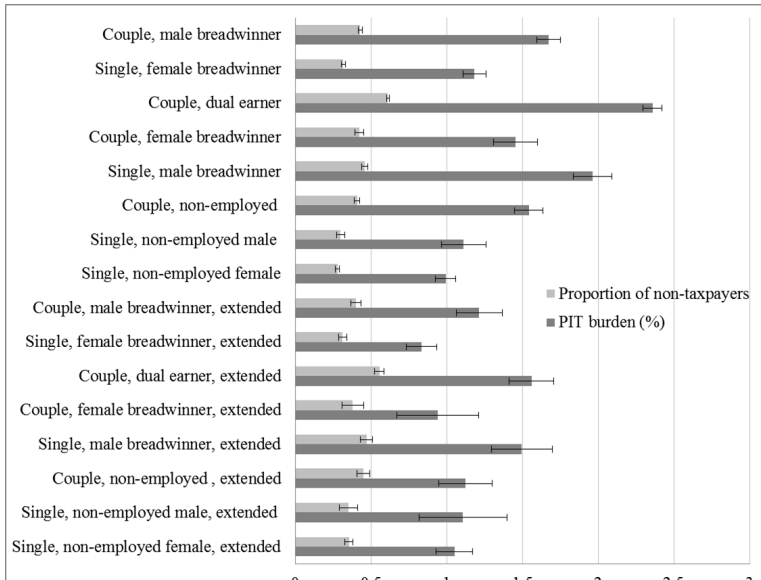
- We aim to identify gender differences in the PIT tax burden as well as to examine the role of some specific household characteristics in the explanation of those differences
- A particular issue is that the main variable of interest, the proportion of PIT in gross income, is a fraction
- Given that most of the households are not taxed and that no household is taxed at 100%, the variable has a high proportion of zeros and no presence of ones

- Several authors (Paolino, 2001; Kieschnick and McCullough, 2003; Smithson and Verkuilen, 2006) argue that the beta regression model is the most suitable for distributional asymmetries
- In practice, the beta distribution is not suitable for modeling data that contains zeros or ones. Therefore, we apply a combination of two distributions. For a detailed description of this methodology see Ospina and Ferrari (2010, 2012)
- We carry out all the estimations using the Stata module `zoib` developed by Buis (2012). The `zoib` command consists of a maximum likelihood estimation of the combined model; a logistic regression for whether or not the proportion equals zero and a beta regression for the proportions in the interval $(0, 1)$. We perform all the estimations using robust standard errors

- PIT is progressive but the distributive effects are limited because of the tax size and exemptions:
 - Kakwani Index: 0.3596
 - Pre-tax Gini: 0.4261
 - Post-tax Gini: 0.4130
 - Reynolds-Smolensky Index: 0.0131
 - Average tax burden: 0.018; given payment: 0.039
 - Around 54% of the population lives in households that do not pay the tax

A Global Incidence Analysis

Exploring differences among households of workers
 Exploring differences among households of non-workers



- PIT is progressive but the distributive effects are limited because of the tax size and exemptions:
 - Kakwani Index: 0.3596
 - Pre-tax Gini: 0.4261
 - Post-tax Gini: 0.4130
 - Reynolds-Smolensky Index: 0.0131
 - Average tax burden: 0.018; given payment: 0.039
 - Around 54% of the population lives in households that do not pay the tax

- Households of workers:

- Couple, dual earner $>$ Couple, male breadwinner (\approx Single, male breadwinner) $>$ Single, female breadwinner (\approx Couple, female breadwinner)

- Households of non-workers:

- Couple $>$ single

- Extended households:

- Similar patterns

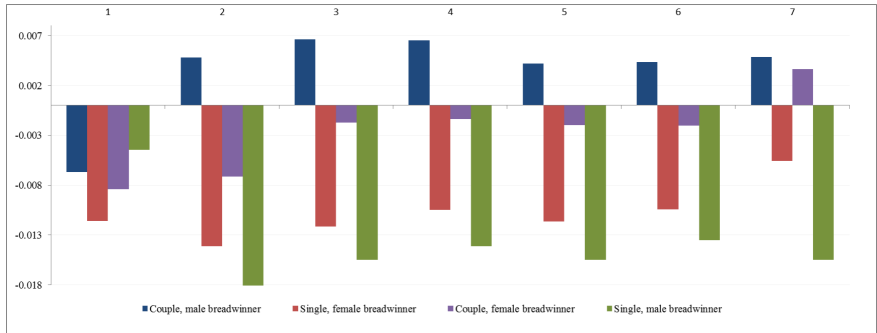
Specifications of the model

- Departing from an estimation in which the independent variables are only the household types, we introduce one by one:
 - Per capita income
 - Household size
 - Presence of children
 - Number of earners
 - Number of informal workers
 - Per capita income by sources (labor, pensions, capital and not taxed sources)

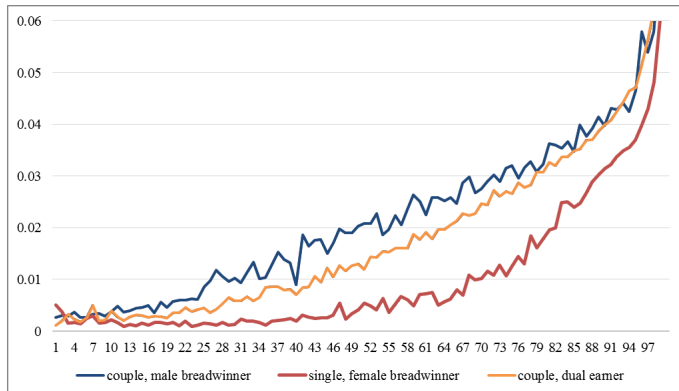
Marginal effects estimated by a zero-inflated beta regression

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Couple, male breadwinner	-0.0067***	0.0048***	0.0066***	0.0065***	0.0042***	0.0043***	0.0048***
Single, female breadwinner	-0.0116***	-0.0141***	-0.0122***	-0.0105***	-0.0116***	-0.0104***	-0.0056***
Couple, female breadwinner	-0.0084***	-0.0071***	-0.0017	-0.0013	-0.0020***	-0.0020***	0.0036***
Single, male breadwinner	-0.0045***	-0.0184***	-0.0155***	-0.0141***	-0.0155***	-0.0135***	-0.0155***
Per capita income		0.0205***	0.0240***	0.0258***	0.0262***	0.0241***	
Presence of children (Yes=1)			0.0142***	0.0112***	0.0097***	0.0087***	0.0085***
Household size				0.0030***	0.0038***	0.0039***	0.0043***
Number of earners					-0.0022***	-0.0007***	-0.0042***
Informal workers						-0.0064***	-0.0047***
Per capita capital income							0.0571***
Per capita labor income							0.0292***
Per capita pension							0.0279***
Per capita public transfer							-0.0037***
Per capita imputed rent							-0.0051***
Observations	124987	124987	124987	124987	124987	124987	124987

Marginal effects estimated by a zero-inflated beta regression

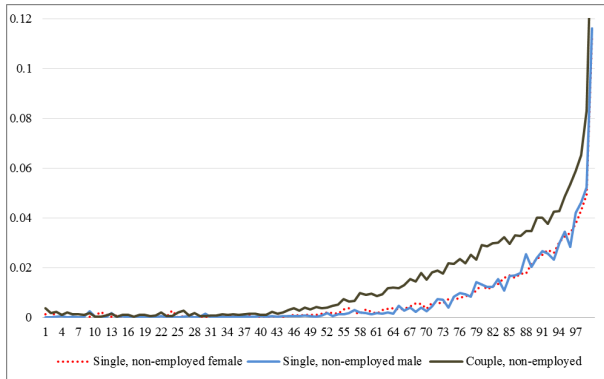


Predicted PIT burden by household type and percentiles of income



Zero-inflated beta model estimation: model (7) where the sources of income are interacted with household type. For the prediction, all variables (except household type) are valued at their mean.

Predicted PIT burden by household type and percentiles of income



Zero-inflated beta model estimation: model (7) where the sources of income are interacted with household type. For the prediction, all variables (except household type) are valued at their mean.

- Given the per capita household income, PIT incidence is higher for male breadwinner households, followed by dual earner households
- This implies an incentive to the equal gender time allocation within the family, which is consistent with a gender unbiased tax
- However, part of this result is due to a higher frequency of labor informality among dual earner households
- Besides, male breadwinner households also bear a higher incidence than female breadwinner households with a dependent spouse

- With regards to the female lone breadwinner type, it exhibits the lowest PIT incidence
- The low level of tax paid by the female types is related to the high participation of non-taxed sources in their household income

- We also study three typical types of non-employed households
- The non-employed couples bear a higher PIT burden than single types given per capita income and other demographic characteristics
- We do not find differences between female and male single categories