BANCA D'ITALIA
EUROSISTEMA

The SHIW as a tool to measure unobserved economic activities

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Introduction

Survey of Household Income and Wealth

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Survey of Hidden Income and Wealth

Crucial for Italy where the size of underground labour and tax evasion is huge

Heterogeneous phenomena in terms of sector, geography, type of employment → at odds with homogeneity, at least de jure, in terms of tax and audit/punishment policies, burden of regulation and bureaucracy

What we do

We show how the SHIW can be exploited to derive estimates on underground labour and tax evasion

For irregular employment we update the exercise in Cappariello & Zizza (2010) to 2014, to assess the consequences of the double recession

We review methodology and available estimates on the propensity to evade personal income tax – from Marino & Zizza (2012) – and on tax morale

Sketch of the talk

- Is the SHIW a suitable tool?
- What has been done so far
- **Underground labour**
- **Tax evasion**
- **Tax morale**
- What else can we learn from SHIW? ("Bonus" material)
- Conclusions

Is the SHIW a suitable tool?

Alternative data sources on income (e.g. social security or tax records) do not serve for the scope as they only cover regular jobs and declared income

Reliance on microdata is important to address the heterogeneity issue

Participation to the survey is not compulsory; questionnaire is multipurpose; respondents are granted anonymity → truthful income reports (respondents do not feel threatened or suspicious)

Interviews are quite long and are delegated to professional interviewers

Is the SHIW a suitable tool?

Household surveys are usually affected by underreporting in self-reported (real and financial) wealth wrt administrative records. Especially due to

- increasing complexity of financial portfolios
- presence of dwellings not used as principal residence
- population ageing

SHIW is not an exception. Cannari & D'Alessio (1990), D'Aurizio et al. (2006), Neri & Zizza (2010) address this issue

We focus on hidden labour and income. The extent of hidden wealth is analysed by Pellegrini & Tosti (2011) and by papers in this session relying on other data sources

What has been done so far: the official statistics

Istat produces estimates of both irregular labour and under-declaration of income to achieve GDP exhaustiveness

Recent in-depth revision of methodologies, based on the reliance on microdata and on the integration between survey (LFS) and administrative sources (Istat, 2014; De Gregorio & Giordano, 2014)

The new method addresses the critiques posed to Franz (1985)

- tailored to different firms types
- considering the business cycle and the economic context in which the firm operates
- suitable to account for more complex production units

What has been done so far: academia and institutions

Estimates of the size of the **underground sector** have mostly exploited sources such as:

- currency data (Bovi, 1999; Schneider & Enste, 2000; Zizza, 2002; Ardizzi *et al.*, 2014)
- consumption of electricity (Kaufmann & Kaliberda, 1996; Lackò, 1996)
- audit data (Bordignon & Zanardi, 1997; Di Porto, 2009)
- **SHIW data** (Brandolini & D'Alessio, 2002; Boeri & Garibaldi, 2005; Cappariello & Zizza, 2010; Capasso & Jappelli, 2013; Di Porto & Elia, 2014)

Model- and survey-based estimates are not suitable for NA compilation but can represent an improvement in terms of timeliness and heterogeneity

What has been done so far: academia and institutions

Two main approaches in the literature to measure **tax evasion**

Macroeconomic → comparison between National Accounts and tax data (Visco, 1984; Bernardi, 1996; Bernardi & Bernasconi, 1997; SOGEI, 1999)

Microeconomic → comparison between **SHIW data** and tax records (Cannari et al., 1997; Bernasconi & Marenzi, 1997; Bordignon & Zanardi, 1997; Fiorio & D'Amuri, 2005; Marino & Zizza, 2012)

Underground labour
(Cappariello & Zizza, 2010)

Identification of underground workers from SHIW

→ **Narrow** and **broad** measures of irregular labour

Modelling the probability of being underground as a function of demographic and socio-economic characteristics

(*in the original paper*) focus on the role of education

(*in this paper*) role of the different characteristics before and after the crisis

Identification of underground workers from SHIW. Narrow measure

Data on self-reported individuals' social security positions

"Considering the lifetime work experience of ..... (name) , did he/she ever pay, or his/her employer pay, pension contributions, even for a short period (and even if long ago)?"

if "no" and the respondent says he has been working

↓

he has been working off the books *throughout his entire career*

Those who are currently irregular but have contributions in the past, or those whose main occupation is regular but hold an irregular second job are not labelled as underground workers

Measure on the conservative side and not strictly comparable with NA which includes those who are currently underground (and hours/second jobs worked underground)

Identification of underground workers from SHIW. Broad measure

SHIW asks number of years/months the individuals (or their employers) have been paying contributions up to the time of interview (YCONTR)

Social contribution evasion if YCONTR < EXPER

SHIW allows calculating *potential* experience POTEXPER, coinciding with EXPER only if working history is very regular (unemployment spells, on-leave periods, voluntarily payments of contributions, imputed contributions)

"tolerance" criteria to identify those who spent a *significant* fraction of their working life underground

Identification of underground workers from SHIW. Broad measure

A worker is labelled partially underground

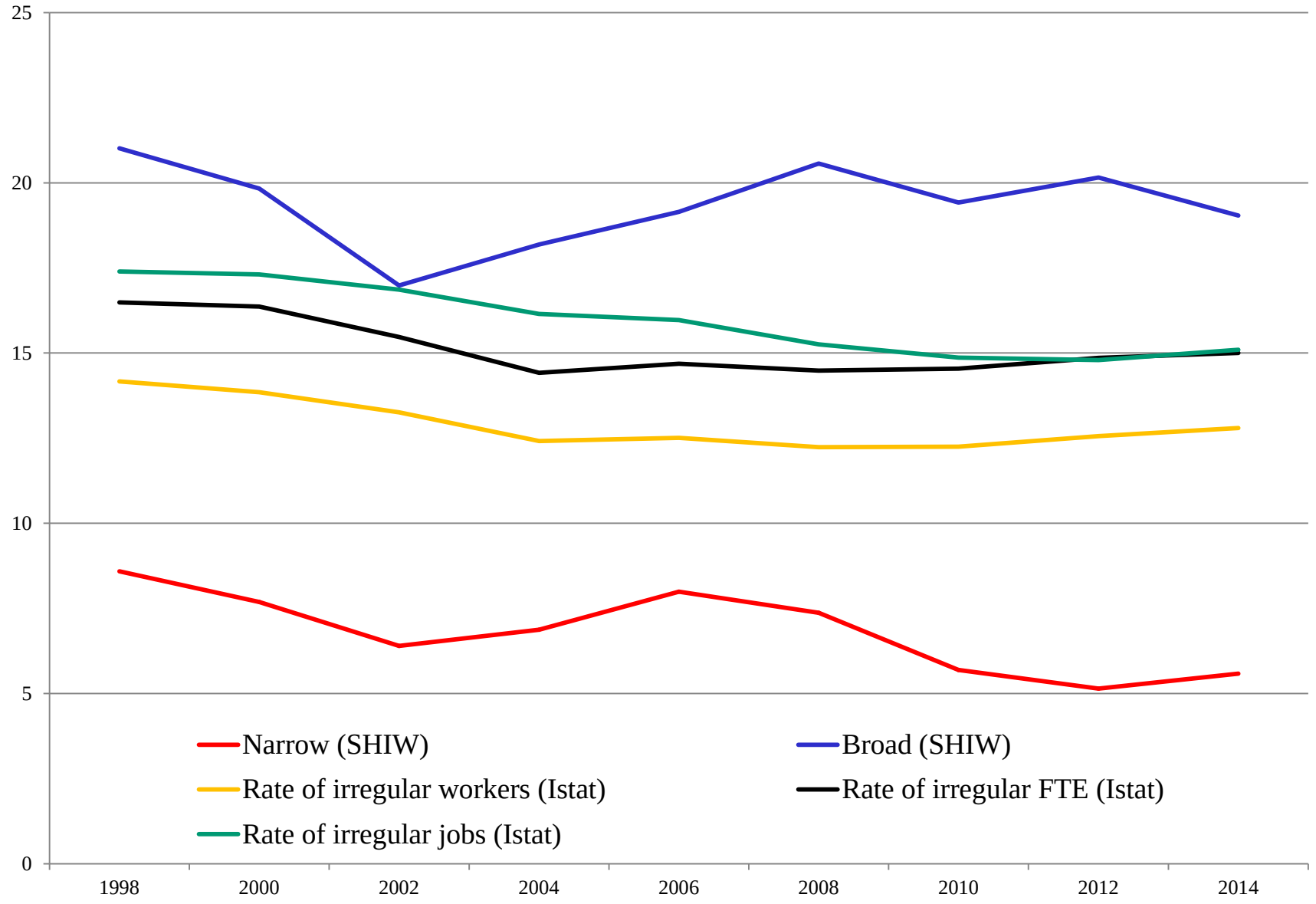
YCONTR / POTEXPER < p25 (relative criterion)
(POTEXPER-YCONTR) > 10 (absolute criterion)

p25 = 1st quartile of the distribution of pension coverage across individuals of the same gender reporting the same number of jobs held (e.g. more discontinuous career profiles for women)

➡ BROAD measure = NARROW measure + partially underground

Still not comparable with NA as it includes workers who were "chronically" underground in the past but are regular today and excludes those irregular today but possibly regular for most of their life

Incidence of irregularity: estimates from SHIW and Istat



Incidence of irregularity in selected groups

Groups	Narrow 1998-2008	Narrow 2010-2014	Broad 1998-2008	Broad 2010-2014	
Men	6.5	4.6	16.9	18.4	M<F
Women	8.7	6.6	22.4	20.9	
14-30 years old	16.6	12.1	17.5	12.9	Y<O
31-40 years old	7.8	7.2	17.6	19.5	
41-50 years old	5.3	4.7	20.9	23.3	
51-67 years old	4.2	2.9	20.2	18.7	
North	3.9	2.4	13.9	13.7	
Centre	7.8	4.7	18.7	17.9	N<S
South and Isles	13.8	11.4	29.6	30.7	
Compulsory school or below	8.4	7.7	25.9	28.7	
High school	6.3	4.2	13.1	14.6	HS<LS
College degree or beyond	7.4	3.4	11.7	9.8	
Always dependent worker	7.0	5.4	18.3	19.3	
Always independent worker	14.2	9.0	24.6	18.6	DE<SE
Either independent or dependent	4.5	3.0	20.2	21.9	
Only one job in working history	9.7	6.6	19.9	17.4	
More than one job in working history	4.9	4.4	18.5	21.7	
Agriculture	7.2	7.6	22.0	24.6	M&S<
Manufacturing	3.6	1.9	11.2	12.5	A&C
Construction	10.6	7.7	29.8	33.4	
Services	6.2	4.6	13.7	14.4	
Total	7.5	5.5	19.3	19.5	

Y>O

Modelling the probability of being underground: a simple probit model

Pooled probit regressions, 1998-2014 surveys. Individuals aged 14-67 years. Dependent variable = 1 if underground, 0 elsewhere

RHS variables:

- highly invariant or permanent conditions (gender, educational attainment, geography)
- Variables accounting for the past working history (no. employers, kind of occupation)
- Exception: sector of economic activity (which refers to the latest job held) → separate regression

Probability of working underground (broad measure)

Explanatory variables	Model A			Model B		
	Entire sample (1)	<=2008 (2)	>2008 (3)	Entire sample (4)	<=2008 (5)	>2008 (6)
Male	-0.0844***	-0.0909***	-0.0691***	-0.0181***	-0.0225***	-0.00661
	(0.00269)	(0.00325)	(0.00480)	(0.00262)	(0.00316)	(0.00469)
Age 31-40	-0.000783	-0.0166***	0.0549***	-0.0142***	-0.0288***	0.0353***
	(0.00444)	(0.00491)	(0.0103)	(0.00386)	(0.00424)	(0.00902)
Age 41-50	0.0152***	-0.00285	0.0712***	-0.00643*	-0.0232***	0.0437***
	(0.00437)	(0.00491)	(0.00955)	(0.00380)	(0.00423)	(0.00836)
Age 51-67	-0.0206***	-0.0248***	0.0044	-0.0501***	-0.0511***	-0.0341***
	(0.00400)	(0.00457)	(0.00827)	(0.00349)	(0.00398)	(0.00725)
More than 1 working experience	0.0231***	0.0127***	0.0434***	0.0420***	0.0324***	0.0640***
	(0.00294)	(0.00354)	(0.00526)	(0.00282)	(0.00340)	(0.00504)
High school	-0.120***	-0.117***	-0.126***	-0.0846***	-0.0792***	-0.0950***
	(0.00256)	(0.00306)	(0.00467)	(0.00251)	(0.00301)	(0.00453)
Degree or beyond	-0.134***	-0.124***	-0.151***	-0.0881***	-0.0770***	-0.106***
	(0.00251)	(0.00318)	(0.00418)	(0.00266)	(0.00343)	(0.00430)
Always independent	0.0712***	0.0802***	0.0461***	0.0728***	0.0813***	0.0526***
	(0.00471)	(0.00557)	(0.00877)	(0.00454)	(0.00539)	(0.00841)
Either depend. or indep.	0.0370***	0.0427***	0.0290***	0.0361***	0.0491***	0.0127*
	(0.00449)	(0.00549)	(0.00787)	(0.00422)	(0.00522)	(0.00714)
Manufacturing				-0.118***	-0.127***	-0.0843***
				(0.00302)	(0.00349)	(0.00667)
Building sector				-0.0237***	-0.0349***	0.0238**
				(0.00467)	(0.00511)	(0.0112)
Services				-0.131***	-0.139***	-0.0852***
				(0.00438)	(0.00488)	(0.00920)
Observations	92.878	64.296	28.582	87.196	60.270	26.926

Notes: variables are all dummies. See Table 2 for omitted categories. Marginal effects evaluated at the sample mean. Robust standard errors are reported in parentheses. The symbols ***, **, * indicate a significance level of 1 per cent, 5 per cent and 10 per cent respectively.

with the crisis:
- the gender divide disappears
- Irregularity becomes more frequent among core age workers and in the building sector (it was agriculture before)

Irregularity always more diffuse among:
- Those with more than 1 job
- Low skilled (but no gain from college)
- Self-employed

Main results

Socio-economic characteristics (education, kind of job, sector) play a greater role than demographic ones (gender, age) in explaining the probability of working underground

Results are fairly consistent when the narrow measure is used and when sample weights are included

Exception: having had more than one working experience has a negative effect; an individual working for more than just one employer is less likely be stuck - either deliberately or not - in an irregular job position throughout his entire career

Tax evasion
(Marino & Zizza, 2012)

Estimate the propensity to evade the personal income tax (Irpef); 70% of Italian population is subject to Irpef, which accounts for about 1/3 of total tax revenues of the public administration

Tax evasion is estimated by comparing per capita income in 2004 from SHIW with that from tax records provided by SOGEI (the society managing the tax information system on behalf of the Italian Tax Administration)

Derive 126 evasion rates (by cell: e.g. young woman living in the Centre earning only income from dependent work)

Elements of novelty

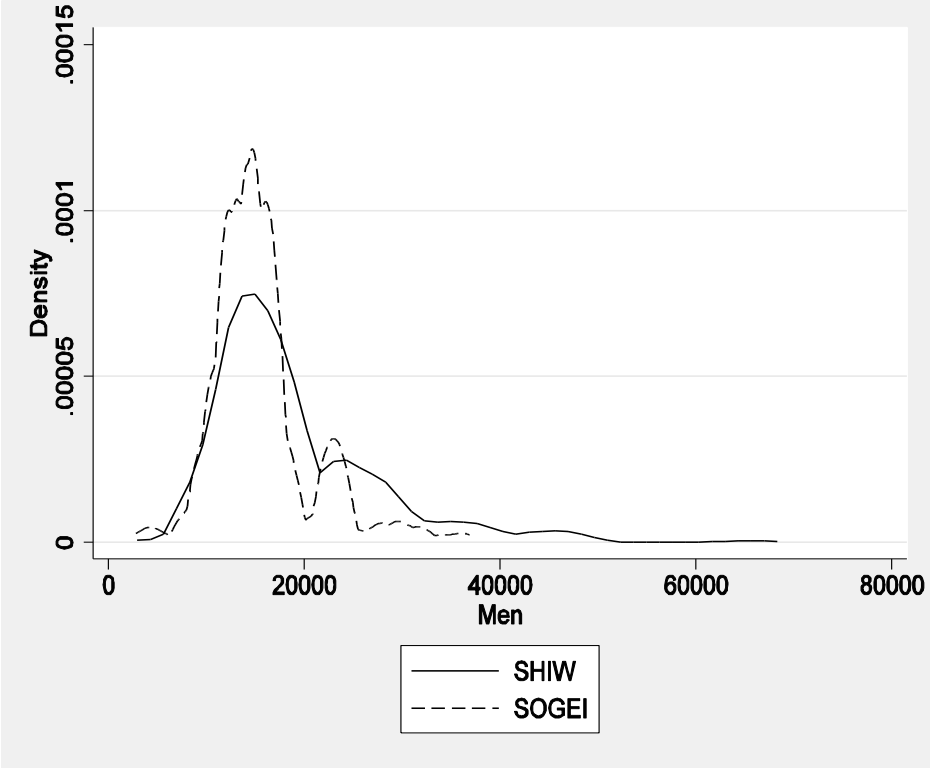
Well-known risks associated with the use of sample surveys are mitigated → "adjusted" SHIW (Neri & Zizza, 2010) more consistent with NA in terms of number of recipients, secondary jobs, amount of certain income types

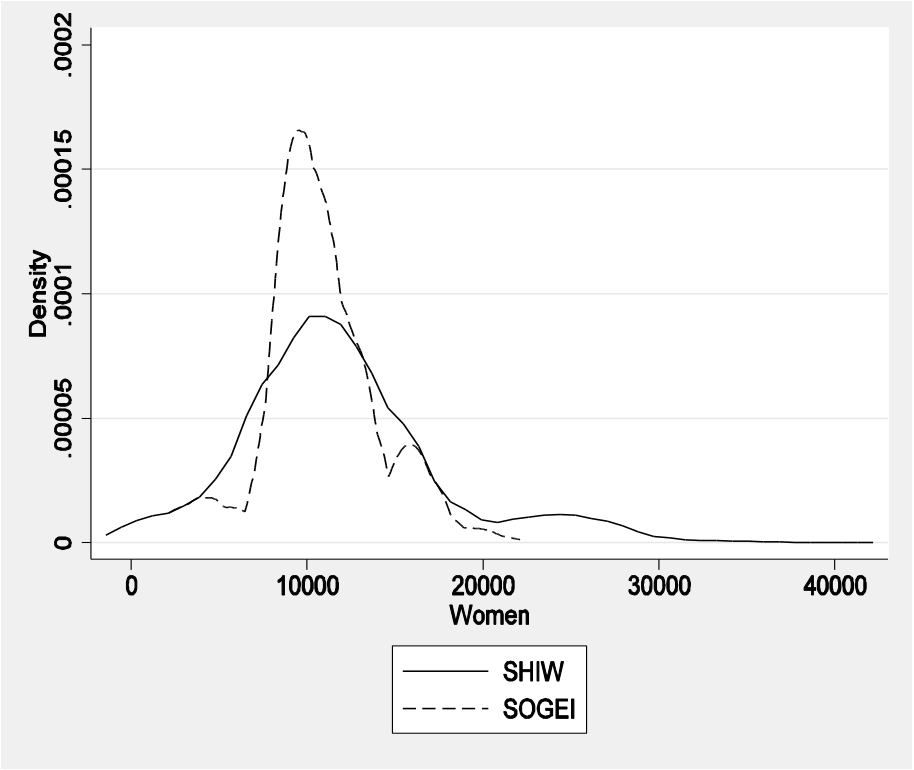
Estimates of tax evasion with a high level of detail (by gender, age, geographical area, income type)

Taxpayers are classified also taking into account secondary jobs and inactive positions: beyond standard dichotomy dependent versus independent workers

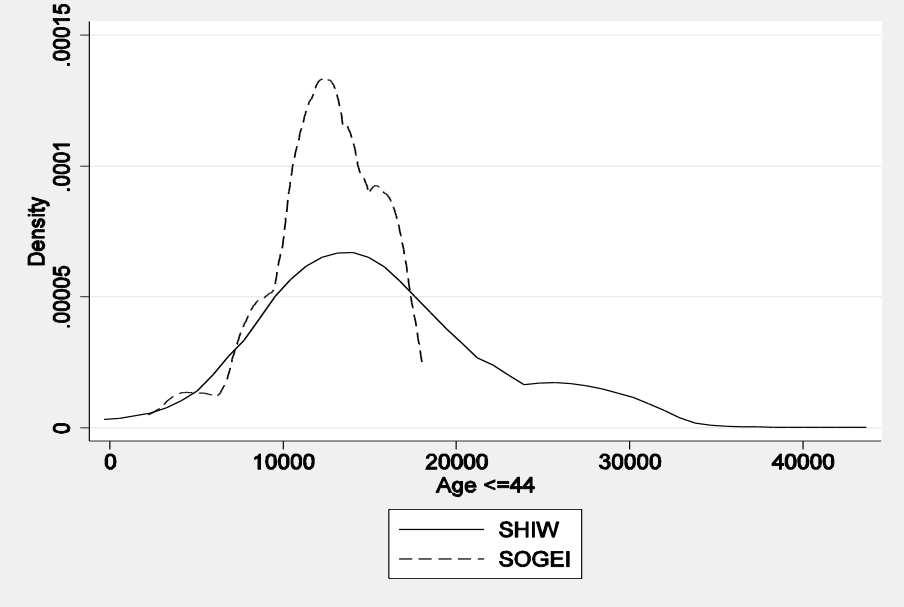
Harmonisation issue taken care of as much as possible (e.g. cadastral revenue retrieved from imputed rents; income from CoCoCo and transfers converted into income from dependent work)

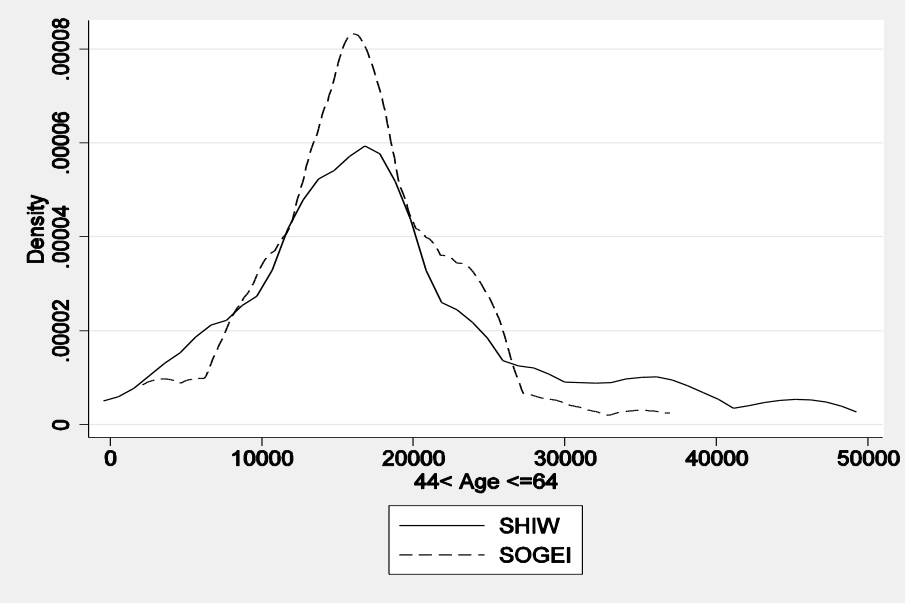
Distribution by gender (from M&Z, 2012)

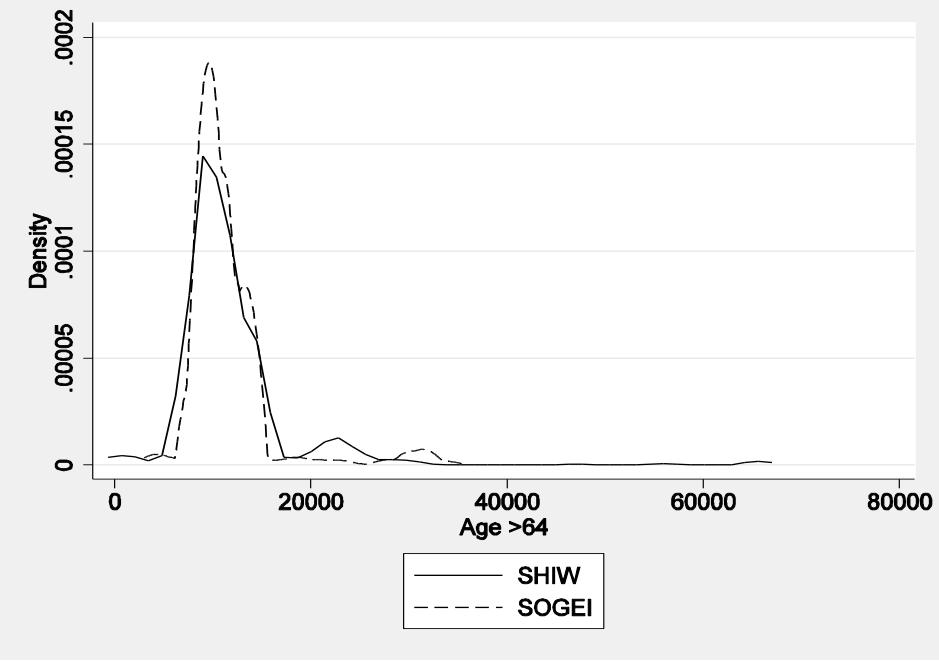




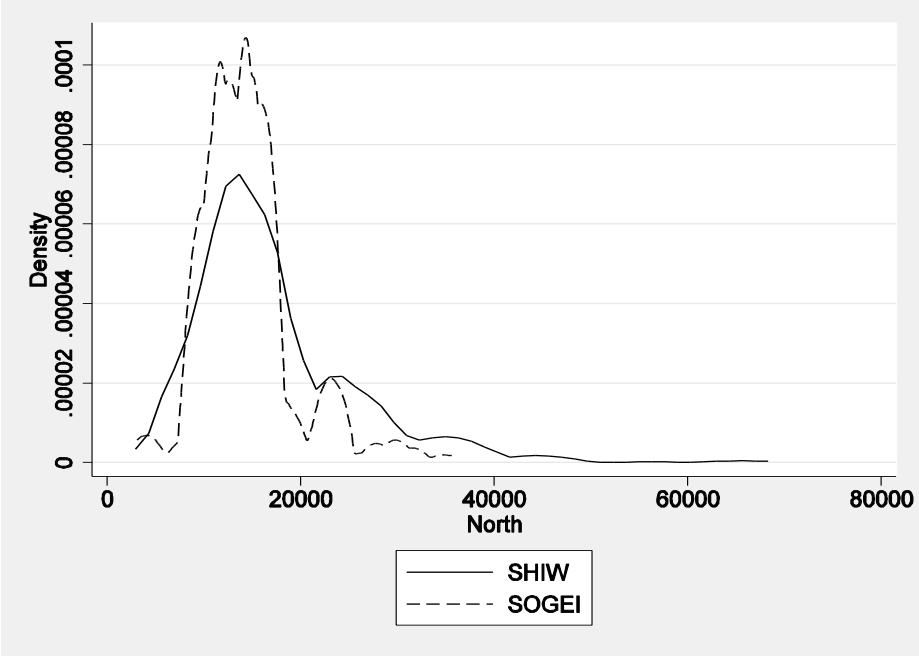
Distribution by age (from M&Z, 2012)

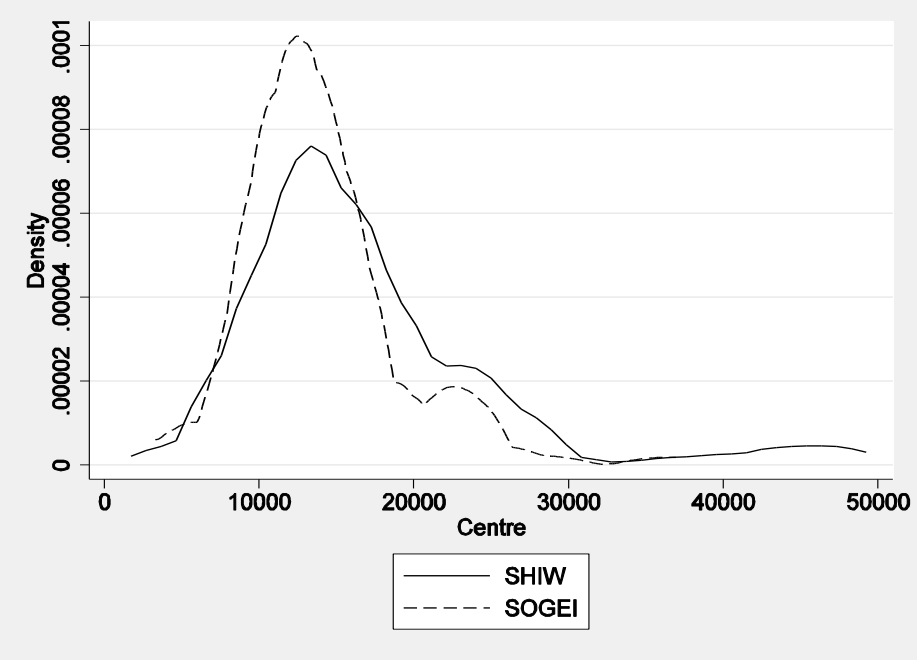


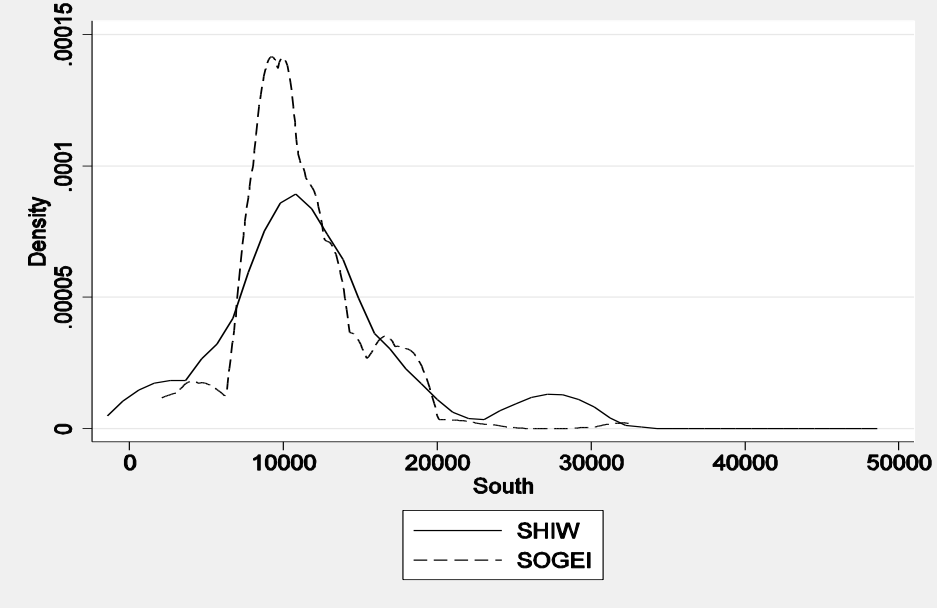




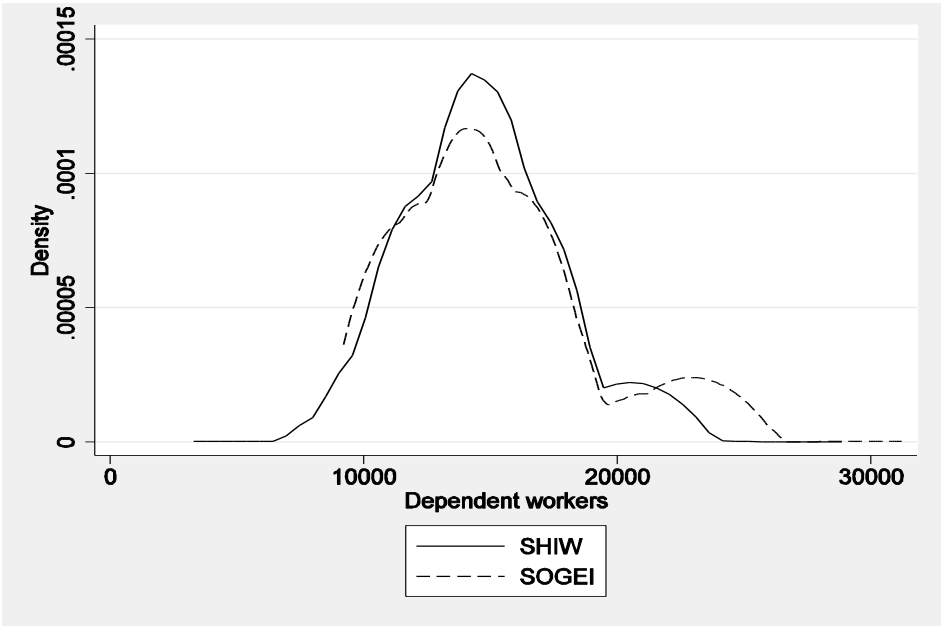
Distribution by geographical area (from M&Z, 2012)

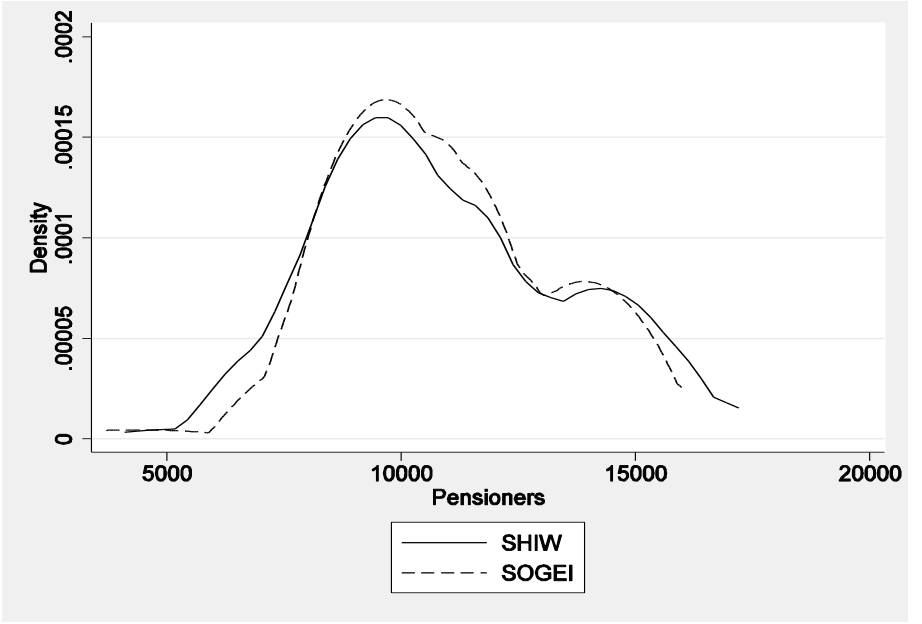


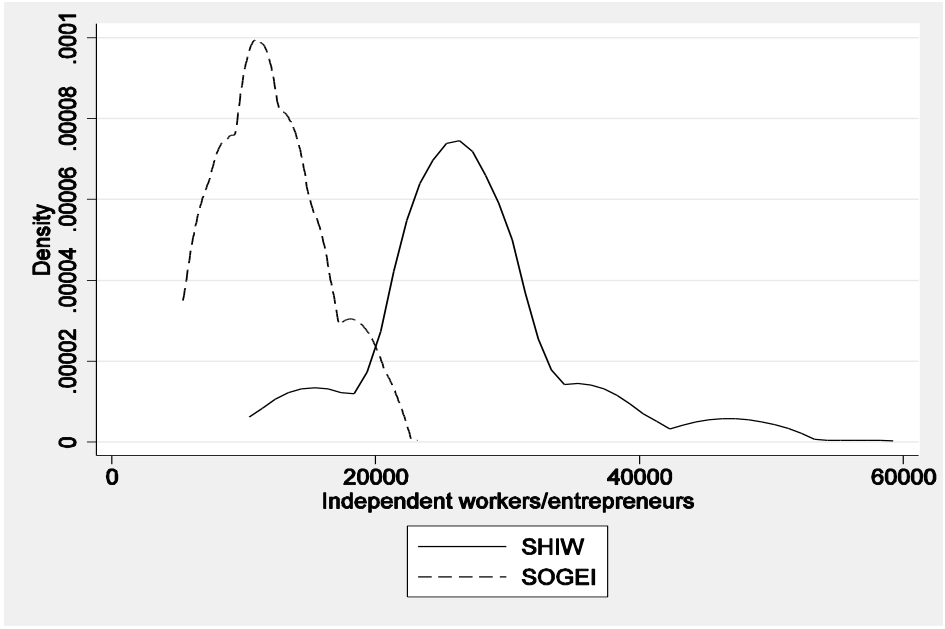


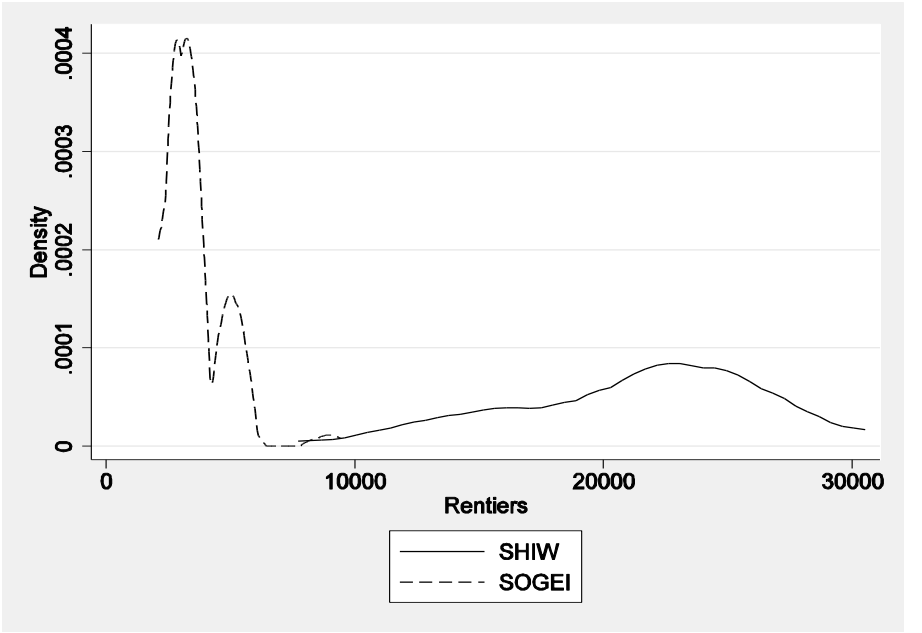


Distribution by income type (from M&Z, 2012)

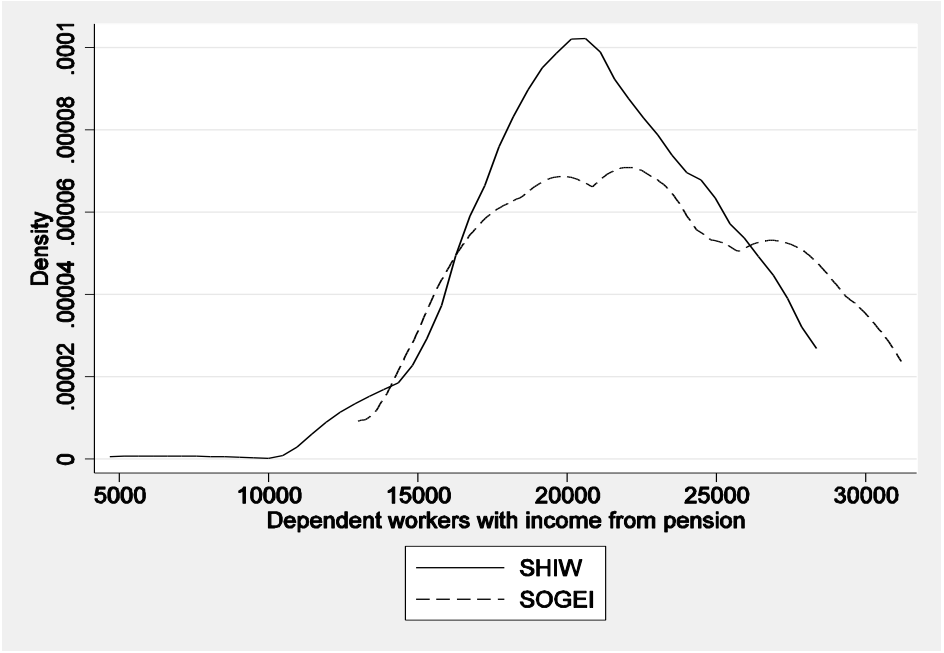


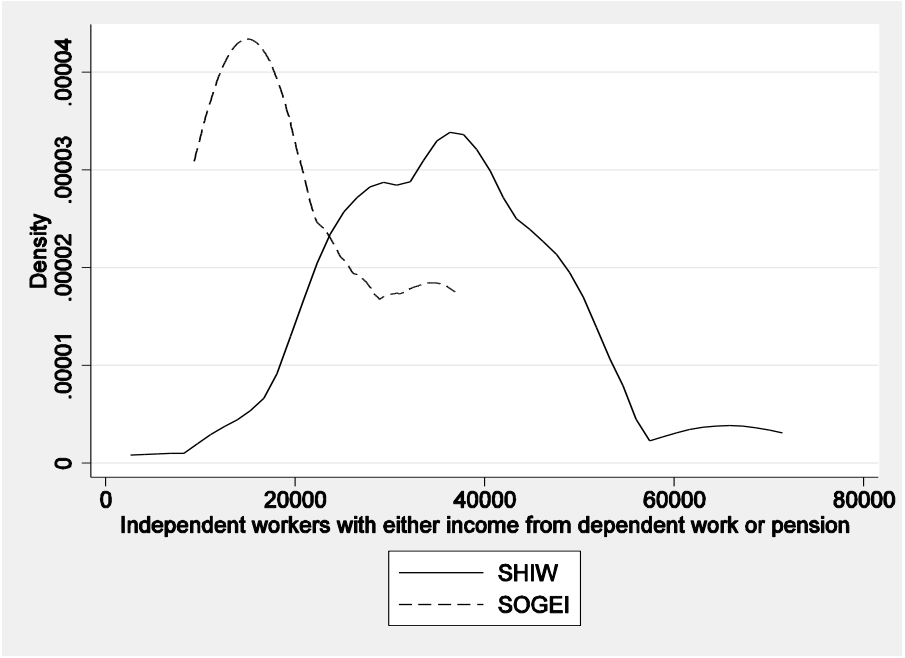


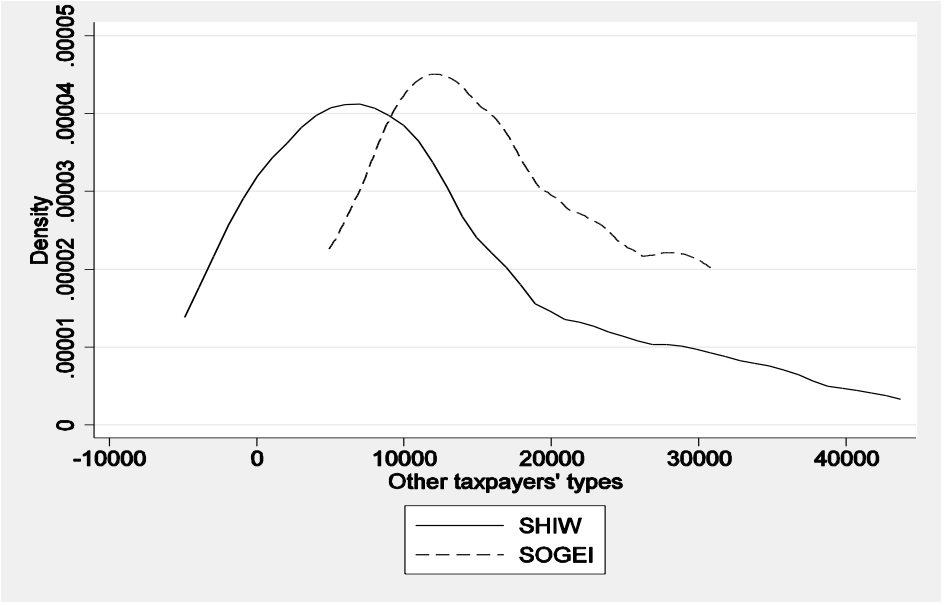




Distribution by income type (from M&Z, 2012)







Evasion rates by characteristics

Characteristics	SHIW		SOGEI		Difference between per capita income (1)	Evasion rate
	Taxpayers	per capita net income (1)	Taxpayers	per capita net income (1)		
Gender						
Man	20,699,048	18,932	21,612,453	15,653	3,278	17.3
Woman	20,335,554	11,904	18,879,643	10,725	1,178	9.9
	41,034,602		40,492,096			
Age						
age ≤ 44	17,432,387	15,428	17,192,526	12,363	3,065	19.9
44 < age ≤ 64	13,096,415	18,386	12,186,526	16,441	1,945	10.6
age > 64	10,505,801	11,822	11,113,044	11,508	314	2.7
	41,034,603		40,492,096			
Geographical area						
North	19,763,271	17,063	20,033,653	14,530	2,532	14.8
Centre	8,469,568	16,850	8,120,830	13,914	2,936	17.4
South	12,801,763	12,030	12,337,613	11,080	950	7.9
	41,034,602		40,492,096			
Taxpayer's type						
dependent worker	16,513,566	14,690	17,675,343	14,931	-240	-1.6
pensioner	12,223,823	10,940	13,582,001	11,023	-83	-0.8
independent worker/entrepreneur	4,645,534	27,020	4,318,697	11,798	15,222	56.3
rentier	1,122,165	21,286	1,122,929	3,462	17,824	83.7
dependent worker and pensioner	1,063,240	21,065	675,158	22,694	-1,629	-7.7
indep. worker + pension or dep. worker	910,369	36,745	1,222,658	20,372	16,373	44.6
Other	4,555,905	11,494	1,895,310	16,942	-5,447	-47.4
	41,034,602		40,492,096			
Whole population	41,034,602	15,449	40,492,096	13,356	2,093	13.5

Total evasion captured only partially. Composition effect? (workers in the public sector and pensioners)

Regression of evasion rates on characteristics

Evasion rate	Baseline regression		Regression with tax morale indicator	
	Coefficient	T statistic	Coefficient	T statistic
Man		Omitted variable		
Woman	-0.37	-0.28	-0.56	-0.39
Age ≤ 44	9.18	3.51**	8.24	2.92**
44 < age ≤ 64	1.67	-0.75	1.25	-0.53
Age > 64		Omitted variable		
North	0.15	-0.10	0.58	-0.31
Centre	3.02	-1.64	3.23	-1.65
South		Omitted variable		
Dependent worker		Omitted variable		
Pensioner	5.82	2.38*	5.08	-1.96
Independent worker/entrepreneur	53.94	24.72**	53.70	22.69**
rentier	78.63	18.41**	78.45	17.29**
Dependent worker with pension	5.25	-1.22	5.29	-1.16
Indep. worker with either pension or income from dep. Work	26.83	5.92**	26.52	5.61**
Other	9.97	4.39**	9.75	4.09**
Tax morale			20.38	-0.31
Constant	-4.82	-1.71	-4.24	-1.42
Number of observations	124		113	
Adjusted R-square	0.89		0.89	
F-test (p-value in parenthesis)	89.86 (0.00)		75.76 (0.00)	

Notes: * significant at 5 per cent, ** at 1 per cent. Regressions weighted with the number of taxpayers in SHIW.

Only age and income type matter

Results on age consistent with Fiorio & D'Amuri (2005) and Cannari & D'Alessio (2007)

Results on income type and on geography consistent with Cannari & D'Alessio (2007)

Tax morale: see infra

Tax morale

The risk of being caught and the size of sanctions are not enough to explain tax compliance

Emphasis on the role of tax morale, i.e. the individual intrinsic motivation to comply with fiscal obligations

SHIW 2004 featured a monographic section on personal attitudes towards tax evasion

"Generally speaking, among the problems facing the Government, how serious is tax evasion (very serious, serious, the same as any other, marginal, non-existent)?"

"Do you think it would be a good thing if tax inspections were made more often?"

"Among the solutions listed, which would be the most effective to counter tax evasion?"

Tax morale

Also opinions on remarks such as:

"Paying taxes is one of the basic duties of citizenship"

"Not paying taxes is one of the worst crimes a person can commit because it harms the whole community"

"It is right not to pay taxes if you think they are unfair"

"In Italy, it's always the same groups of people that pay taxes"

"Even if someone thinks a tax is unfair, he/she should pay it first and then complain if necessary"

"Some people are obliged to evade tax in order for their business to survive"

"It is right to pay taxes because it helps the weak"

"People are happy to pay taxes if the country functions properly"

"People will be more willing to pay taxes if they know everyone else does"

Tax morale

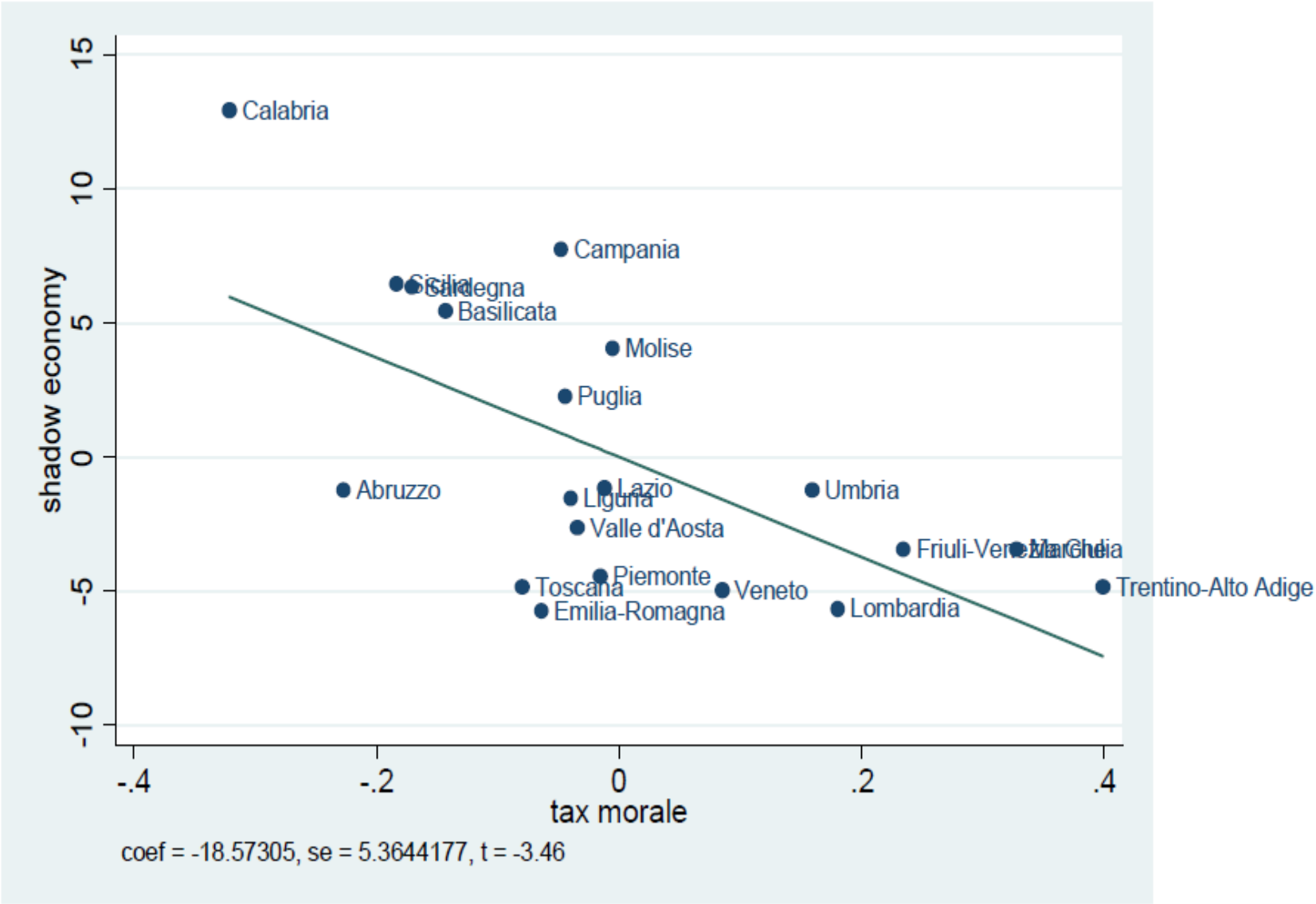
Tax evasion is held a serious or very serious problem by ¾ respondents

The size of tax evasion is correctly perceived by the majority of respondents, who posit the loss of tax revenues as a result of tax evasion in a range between 10% and 20%

Cannari & D'Alessio, 2007; Fiorio & Zanardi, 2008; Barone & Mocetti, 2011; Filippin, Fiorio & Viviano, 2013 use a subset of these statements to build an individual index of tax morale using PCA

Some of these papers shed light on the relationship between tax morale and the efficiency of the public sector

Figure 3: Tax morale and shadow economy



Source: Barone & Mocetti (2011)

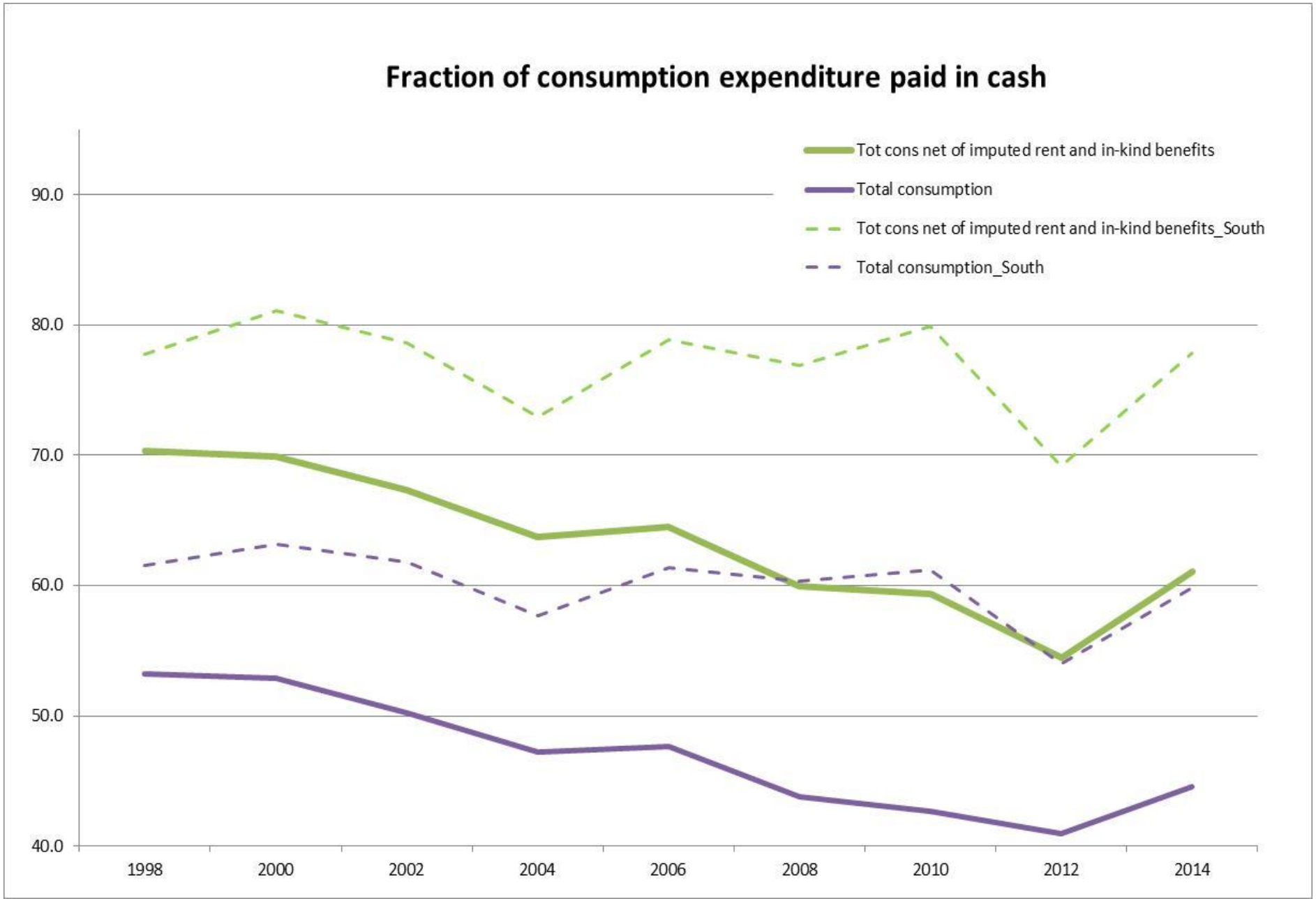
Back

What else can we learn from SHIW on unobserved activities?

Feeding the policy debate on thresholds in cash use….

- **Fraction of income received in cash** (as in Capasso & Jappelli, 2013): equal to 31% on average in 1995-2004; in 2006, the last year in which the information was collected, we obtain a fraction equal to 27% (49% in the South)

- **Fraction of consumption expenditure paid in cash**


Fraction of consumption expenditure paid in cash
Tot cons net of imputed rent and in-kind benefits
Total consumption
Tot cons net of imputed rent and in-kind benefits_South
Total consumption_South
90.0
80.0
70.0
60.0
50.0
40.0
1998
2000
2002
2004
2006
2008
2010
2012
2014

Conclusions

Individual data are needed against the background of heterogeneous and complex phenomena; they also allow to better address harmonisation issues

"Nothing compares to SHIW" as far as measurement of hidden labour and income is concerned

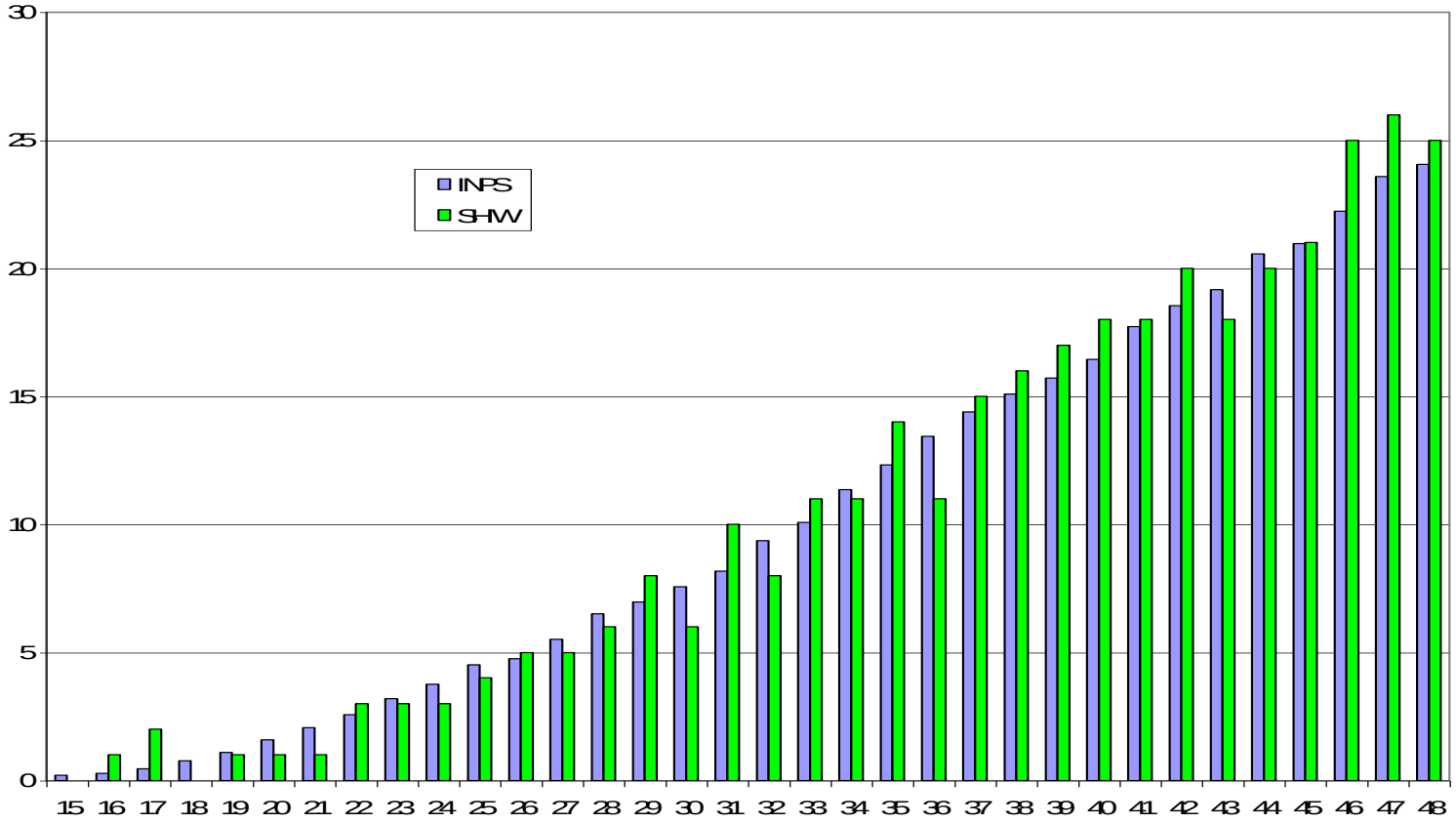
Socio-economic characteristics (education, kind of job, sector) play a greater role than demographic ones (gender, age) in explaining the probability of working underground

Updating the estimates on tax evasion would be helpful; dialogue and exchange of information with other institutions are opportunities that cannot be missed

Comparison between SHIW and Social Security records

Median no. of years when pension contributions have been paid by age

Men and women



Notes: agricultural and public sectors excluded from SHIW and focus on individuals working in 2004 and born after 1956, as Inps archive starts recording only from 1970

Back

SHIW adjustment

(Neri & Zizza, 2010)

- Using EU-SILC (linked with administrative data) number of perceivers/income sources (especially from secondary jobs) is realigned with NA
- Income from self-employment revised upwards using Pissarides & Weber (1989)
- Income from financial assets revised upwards using D'Aurizio et al. (2006), via correction of the assets
- Rents revised upwards using Cannari & D'Alessio (1990) who impute "missing" secondary dwellings from Population Census