

Distributional implications of income tax evasion in Greece, Hungary and Italy*

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Abstract

Even though tax evasion has been the focus of a growing volume of research in recent years, the issue of its distributional impact is still relatively neglected. This paper is an attempt to analyse empirically the implications of tax evasion in terms of inequality, poverty, redistribution and progressivity of the income tax system in Greece, Hungary and Italy (three countries featuring an extensive informal economy, variously estimated to range from one-quarter to one-third of official GDP). The paper applies the discrepancy method, i.e. compares two sets of data, household budget surveys and income tax returns, to derive ratios of under-reporting by income source and geographical area. The tax-benefit model EUROMOD is used to estimate the distributional impact of tax evasion comparing household disposable incomes to a full compliance counterfactual.

Keywords: tax evasion, inequality, microsimulation

JEL subject codes: H26, H23

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1. Introduction

Even though interest in tax evasion has been growing in recent years, the large volume of research generated includes few attempts to study its distributional impact. Yet, tax evasion raises significant issues from the point of view of distributional analysis.

In terms of horizontal equity, individuals with similar income may differ in terms of opportunity and inclination to under-report it. As a result, tax evasion violates notions of fairness and equal treatment, and undermines the idea of reciprocity which lies at the heart of the social contract between tax payers and the state.

In terms of vertical equity, “if the poor had more opportunity of evading taxes than the rich, or were better at it, then the egalitarian policy maker might have good reason to smile indulgently on evasion: up to a point anyway” (Cowell 1987, p. 195). However, it could also be that tax evasion softens rather than strengthens the redistributive impact intended by the tax schedule.

The aim of this paper is to provide preliminary estimates of the size and distribution of income tax evasion in Greece, Hungary and Italy. As discussed in the next section, in all three countries the informal economy is widely held to be very extensive, accounting for between one-quarter and one-third of official GDP.

Ignoring tax evasion not only distorts the intended effects of policy changes in social benefits and the tax system, it also affects the estimation of such effects through tax-benefit models. This poses a difficult challenge to microsimulation. Conversely, correcting for tax evasion may significantly improve the accuracy and credibility of tax-benefit models.

The structure of the paper is as follows. Section two offers a brief literature review. Section three presents data and explains the methodology. Section four reports the results. Section five discusses our findings. Section six raises issues for further research.

2. Literature review

According to recent estimates, the share of the undeclared economy ranges between 26% and 28% of GDP in Greece, Italy and Hungary (Schneider and Klinglmaier 2004, referring to 2002/2003), while undeclared work as a proportion of the labour force is estimated to be in the region of 16% to 18% in Hungary and Italy, and over 20% in Greece (European Commission 2004, referring to 1995-2001).

Comparative evidence on tax evasion, which is only a part of the shadow economy, is more limited. Christie et al. (2005) find that compliance with respect to Personal Income Taxes (PIT) and Social Security Contributions (SSC) in Hungary and Italy in 2002 ranged between 62% and 83% (corresponding to tax evasion between 17% and 38%). Official estimates are more cautious: the “tax gap” is calculated to be “over 10%” of total tax receipts in Hungary (Ministry of Finance, cited by World Bank 2008, p. 15). Evasion of all taxes in Greece in 1997 was estimated at 14.7% of GDP (Tatsos 2001).

Evidence on patterns of non-compliance has some common features across countries. The self-employed are more likely to conceal their incomes than employees. Typical sectors include agriculture, construction, tourism and services. Evasion was found to be more common among men in Estonia (Kriz et al. 2007) and Hungary (Elek et al. 2009). People with lower education are more likely to evade taxes in Estonia (Kriz et al. 2007) and Greece (Tatsos 2001). Some studies highlight the higher frequency of young age groups (Tatsos 2001), others those of pre-retirement age (Elek et al. 2009), others both – adding that the middle-aged are less likely to evade taxes (Kriz et al. 2007). The evidence related to income is mixed. While Fiorio and D’Amuri (2005) conclude that in Italy the proportion of income concealed from tax authorities decreases with income, Tatsos (2001) finds that high income earners in Greece are more inclined to tax evasion.

The measurement of tax evasion tends to comparisons of various alternative data sources, including tax audit data, actual tax return data, survey data, or data generated through laboratory experiments. Tax audit data appear at first sight to be the most accurate, showing the difference between reported tax and the correction by the tax examiner for non-compliance. However, these do not detect all evasion, especially in the form of income understatements (Andreoni et al. 1998, p 836). In addition, tax audit data tend to be non-random, while at the same time little is known on the selection of tax forms for auditing. This appears to be the main reservation against the study by Bordignon and Zanardi (1997) on Italy, who found that 84% of self-employed workers under-reported their income at an average rate of 45% (calculated as a rate of reported over audited income).

The main intuition of the consumption-based approach is that if the self-employed and dependent employees have the same preferences regarding food, and if the latter truthfully reveal their income in a survey, then estimated differences in the relationship of reported income to food expenditure between the two groups can be attributed to income under-reporting on the part of the self-employed (Pissarides and Weber 1989, Lyssioutou et al. 2004). Income surveys provide an alternative source of information on non-compliance. On the grounds that tax evaders have no incentive to conceal their true income when responding to an income survey, some studies have combined survey information with random samples of tax forms in order to estimate tax evasion (Marenzi 1996, Bernasconi and Marenzi 1997, Fiorio and D'Amuri 2005). Our study is also based on this assumption, comparing income surveys to administrative tax records. The methodology is discussed next.

3. Data and methodology

Our estimation of the size and incidence of tax evasion in the three countries relies on the following assumption: respondents to an income survey have no incentive to conceal their income and are therefore more likely to reveal it truthfully; the opposite is the case when individuals fill in their tax return, as tax payers who decide to hide part of their income have a good chance of ending up with a higher post-tax income than would have been the case under full compliance. The paper applies a variation of the “discrepancy method”: we estimate the extent and distribution of income under-reporting for the purposes of tax evasion by comparing the tax returns and income survey responses of identical or similar individuals.

More specifically, we draw on two sets of data: (a) incomes observed in a household budget survey, and (b) incomes reported in tax returns.

In the case of Greece, we compare data from the 2004/05 Household Budget Survey on 17,400 individuals in 6,600 households, with a sample of unaudited tax returns filed in 2005 by 41,300 tax payers in 27,400 tax units. Both sources report incomes earned in 2004.

In the case of Hungary, we compare information on 24,500 individuals in 9,000 households from the Household Budget Survey, with a random sample of the tax records of 228,000 individuals. Both datasets contain information on incomes earned in 2005.

In the case of Italy, we compare data on 21,100 individuals in 8,000 households from the Bank of Italy Survey of Household Income and Wealth, with aggregate statistics on the number of tax payers, taxable income and tax paid as published by the Italian Ministry of Finance. Both sources refer to incomes earned in 2002.

Comparability issues between the two sets of data arise immediately. To some extent, income surveys and tax records are drawn from different populations and report incomes differently. Clearly, failure to account for this will bias findings.

On the other hand, it is well known that income surveys are plagued by measurement and reporting errors. Such errors are likely to be higher at the two ends of the income distribution than in the middle, and to affect certain types of income (e.g. capital gains) and categories of people (e.g. pensioners) more than others.

A more fundamental problem concerns the assumption that surveys approximate the (unknown) distribution of true incomes better than tax returns. Given that individuals have no incentive to report lower-than-true incomes to survey interviewers (as their disposable income will not be affected by their response), this assumption seems reasonable – and has been explored to great effect (recently by Fiorio and D’Amuri, 2005). Nevertheless, income under-reporting in surveys cannot be simply assumed away. For instance, the consumption-based approach to tax evasion takes as a point of departure the intuition that expenditure data are more reliable than income data in surveys reporting both (see Pissarides and Weber, 1989; Lyssioutou et al., 2004). Moreover, there is some evidence (Elffers et al., 1987) that the factors contributing to tax evasion (low trust, low tax morale and so on), together with the wish of tax-evading individuals to be somehow “consistent”, may cause under-reporting of incomes in the survey as well, albeit at a lower level.

The adjustments we made in response to the above concerns are discussed below, while the residual implications for our results are revisited in the concluding section.

A great deal of effort was put into ensuring that the income variables are consistently defined and that the reference population is comparable in the two sets of data analysed in each country. In all three countries, most or all incomes in the survey are reported net of taxes and social contributions, while in tax returns most or all are recorded in gross terms. Therefore, a first task was to make the necessary adjustments so that the income concepts are consistent across datasets.

In the case of Greece, this required careful treatment of farming and self-employed incomes (reported gross of social contributions in the survey), and of wages or salaries and pensions (reported net of social contributions in the tax records). Also, in view of the fact that renting out rooms or apartments is often associated with informal activity in tourism, property incomes were merged with incomes from self employment.

Similar adjustments were made in the other two countries, where only incomes from dependent employment and self employment were considered. In the case of Hungary, pensioners not reporting labour income were excluded from the sample since most social benefits including pensions are tax-exempt. In the case of Italy, most property income is imputed rent from owner-occupied housing, which is estimated subjectively in the survey but is taxed “objectively” according to a standard formula. Moreover, the possibility of under-reporting pension incomes with a view to tax evasion was ruled out, and differences between the two sources were mostly attributed to respondents misclassifying contributory minimum pensions (taxed as income) and non-contributory social pensions (not subject to income tax).

With respect to identifying the reference population, we had to reweight the sample of tax returns so as to make it representative of the population of tax payers, then reconcile the reweighted sample of tax returns with the survey.

In the cases of Greece and Hungary, the sample of tax returns was reweighted by occupation and geographical area in terms of both the population distribution and the corresponding distribution of average household (tax unit) income, while the reweighted sample of tax returns was reconciled with the survey to ensure that the population of tax payers was similar in the two datasets. In Italy no adjustments to the tax records could be made, as only aggregate income tax statistics were accessible.

A further adjustment concerned the distinction between income under-reporting and tax evasion. In the cases of Hungary and Italy, where no personal allowances are available, €1 of labour income under-reported is worth €0.18 income tax saved – assuming no detection by the tax administration – even at very low income levels (as explained in the Appendix, in the years considered the standard rate was 18% in both countries). In the case of Italy, this effect is mitigated by the availability of tax credits. Interestingly (and probably in recognition of, and in an attempt to “compensate” for, tax evasion), tax credits are more generous for employees than for the self-employed. In contrast, in the case of Greece, a tax-free personal allowance is available, again set higher for employees or pensioners than for the self-employed. In view of the above, comparisons between survey incomes and incomes reported in tax returns were restricted to the population of tax payers, defined as those liable to pay an amount of tax that is greater than zero.

Furthermore, with respect to obtaining adjustment factors needed to correct incomes for tax evasion, we allocated the total incomes of the reference population into a number of mutually exclusive categories defined as combinations of geographical area and income source. Each adjustment factor is defined as $\alpha_{ij} = \bar{y}_{ij}^{\text{IR}} / \bar{y}_{ij}^{\text{HBS}}$, where \bar{y}_{ij}^{IR} and $\bar{y}_{ij}^{\text{HBS}}$ denote the average income from source j of residents in geographical area i as reported in tax returns and in the survey respectively.

In all three countries, small rates of over-reporting were actually observed in some geographical areas for income from wages and salaries (and, in the case of Greece, for pension incomes as well). The corresponding adjustment factors were set equal to one, on the grounds that no-one knowingly reports higher incomes in a tax return than in an income survey. ($\bar{y}_{ij}^{\text{IR}} / \bar{y}_{ij}^{\text{HBS}} \leq 1, \forall ij$). Finally, the adjustment factor for farming income in Athens was set equal to 1 minus the average under-reporting rate across geographical areas (53.2%) for that income source, as the relevant category was too small in the survey ($n=8$).

The resulting adjustment factors by income source and geographical area are shown in Table 1.

[TABLE 1]

The implications of income under-reporting in terms of tax evaded and the resulting distribution of post-tax household disposable incomes were drawn out by comparing our approximation of the real world on the basis of our estimate of income under-reporting by category with the counterfactual of full tax compliance using the European tax-benefit model EUROMOD (<http://www.iser.essex.ac.uk/msu/emod/>).

4. Results

Our results are summarized in Tables 2-4.

Table 2 shows our estimated rates of under-reporting by income quantile, defined by reference to non-equivalised personal pre-tax incomes.

[TABLE 2]

The overall rate of under-reporting is very similar in the three countries (10-12%).

In Greece, the extent of income under-reporting seems to be largest at the two ends of the distribution. Income is mostly concealed from the tax authorities by people in the top income decile (about 15%), followed by those in the bottom three income deciles (10-11%). The rate of under-reporting in the top centile is 24%, and falls somewhat to 19% in the top 1‰ of the distribution.

In Hungary, the estimated rate of under-reporting peaks locally to 12% around decile 3, then rises again in the upper half of the distribution to almost 16% in the top income decile.

In Italy, income under-reporting appears to increase from 2% to 2.5% in the bottom two deciles to almost 7% in decile 5, and then again from around 4% to almost 21% in the

top decile. In both countries, the rate of under-reporting continues to rise further up the distribution, to around 26% in the top 1% and to around 39% in the top 1%.

Table 3 presents the fiscal implications of tax evasion, as a comparison of taxable income and the resulting tax liability under income under-reporting with the counterfactual of full tax compliance. It is worth highlighting our finding that tax evasion reduces the income tax yield rather considerably: by 19% in Hungary, by 21% in Italy, and by as much as 26% in Greece.

[TABLE 3]

Our estimates of the distributional implications of tax evasion vs. full compliance in terms of poverty, inequality, tax progressivity and redistribution (analysed on the basis of the distribution of equivalised household disposable income) can be seen in Table 4.

[TABLE 4]

Since tax evasion increases post-tax incomes, it is quite likely that median equivalised household disposable incomes will rise as well. By implication, the poverty line at 60% of median will also go up. In this case, it rises by 1% in Greece and by around 3.5% in Italy and Hungary. In response to that, our two poverty indices, headcount rate and poverty gap, increase in the case of Greece and Italy (significantly at the 5% level), and decrease in the case of Hungary (not significantly at the 5% level).

In contrast, our five inequality indices (S80/S20, Gini, Atkinson for $e=0.5$ and $e=2$, and Theil) increase considerably in all three countries, implying that tax evasion results in a more unequal income distribution. This effect is especially pronounced with respect to the Theil index and the Atkinson index for $e=0.5$. Finally, our results for the three indices of tax progressivity and redistribution estimated here (Kakwani, Reynolds-Smolensky, Suits) show that the effects of tax evasion are strongly negative. Specifically, the decline in the Kakwani index ranges from 10% to 16%, the reduction in the Suits index from 13.5% to

22%, while the estimated decrease in the Reynolds-Smolensky index was more dramatic: from 23.5% in Greece and 27% in Hungary to 40% in Italy.

5. Discussion

As shown earlier, the ratio of income from dependent employment that is reported in tax records to income from the same source as observed in household budget surveys is close to one in all three countries. In contrast, the estimated rate of under-reporting with respect to income from self employment ranges from 24% in Greece to 51% in Italy to as much as 71% in Hungary.

This is a striking finding, but broadly consistent with both the empirical literature and prior notions as to the different opportunities for tax evasion presented to different occupations. For instance, Sandmo (2005) noted that as wage income is typically reported to tax authorities by the employer, under-reporting by the employee would lead to certain detection (p.649). As a matter of fact, the US Taxpayer Compliance Measurement Program reported that the rate of under-reporting in 1988 was 58.6% for self-employment income, compared to 0.5% for wages and salaries (cited in Slemrod and Yitzhaki 2002, p. 1440). In Italy, Fiorio and D'Amuri (2005, p. 253) estimated that under-reporting of self-employment income was up to 27% higher than in the case of income from dependent employment.

Even though there are good reasons to accept that the rate of under-reporting of income from self employment is very high in the countries considered here, it nevertheless seems unlikely that under-reporting of income from dependent employment is near zero. Indeed, the assumption that, because wages and salaries paid to employees are reported by employers, under-reporting must be zero does not hold in the case of collusion – when the employer and the employee agree to conceal all or part of the wage paid in order to reduce both employers' labour costs and workers' take-home pay.

In fact, empirical evidence suggests that all three countries feature a large shadow economy centred on unregistered, precarious jobs. In 2003, an inspection of 145,000 firms by the Italian National Institute of Social Protection INPS (cited in Fiorio and D'Amuri 2005, p. 255) showed that approximately 63% of firms used irregular payment methods such as “pay on the side”, while the National Statistical Service ISTAT estimated the size of irregular labour force at 14%. In the same year, the Greek Social Insurance Foundation IKA estimated that 12% of firms failed to pay employer social contributions for its workforce in 2003, while 20% of workers remained unregistered. In Hungary, a recent study estimated the share of unregistered employment at 17% of the labour force, while more than half of employees reporting earning at the minimum wage in 2003 in fact received about one-third of their actual pay in a “brown envelope” (Elek et al. 2009). In all three countries, such “informal” practices were particularly widespread in retail trade, the construction sector, tourism and so on.

We think there are three reasons we failed to detect much under-reporting of wages and salaries earned by the informally employed. To start with, a large proportion of those concerned belong to ethnic minorities and other disadvantaged groups (illegal immigrants, the Roma) who tend to be under-represented in household budget surveys. On the other hand, tax records are truncated, either in the sense that unregistered workers by definition are invisible to tax authorities, or because those earning below a very low level (€3,000 a year in Greece) are legally exempt from the obligation to fill in a tax return, or because in order to compute adjustment rates we deliberately restricted our analysis to those liable to pay an amount of tax that is greater than zero. Thirdly, following up on the last point, given that our original samples of tax records and of household budget surveys were drawn from different populations, as a consequence of which a considerable amount of reweighting had to be done, it is possible that some variability was smoothed out.

A further striking result concerns the pattern of under-reporting. Roughly speaking, the rates shown in Table 2 suggest a U shape in the cases of Greece and Hungary, and a J shape in the case of Italy. In other words, according to our results, it appears that the rate of under-reporting is higher among low earners than middle-income tax payers (except in Italy), and highest in top incomes.

Clearly, the implications of a given rate of under-reporting at low levels of income are very different from those of the same rate further up the income distribution – and not just because of the difference between relative and absolute terms. Because of progressive income taxation and significant tax-free allowances or tax credits for low earners (especially with dependants), the effects of income under-reporting at low income levels in terms of unpaid tax are pretty minimal – notwithstanding our previous discussion of unregistered employment. In contrast, extensive under-reporting among high earners has a considerable impact on inequality and on the progressivity of the income tax system, and translates into sizeable losses in terms of tax receipts.

Note that our approach significantly departs from that of earlier studies (e.g. Fiorio and D’Amuri 2005) in one significant respect, namely that our estimates of under-reporting by level of income are due to a pure composition effect, i.e. result from our application of adjustment rates by income source and geographical area to the entire income distribution. In other words, we specifically assume that all income from source j earned by residents of area i will be under-reported at the same rate, regardless of its level. On the contrary, Fiorio and D’Amuri (2005) estimated under-reporting by income centile (p. 252). As Mantovani and Nienadowska (2008) have shown, adopting the latter approach amounts to implicitly assuming away re-ranking effects, which in turn under-estimates the regressive impact of tax evasion.

Using the tax-benefit model EUROMOD enabled us to compute the distributional and fiscal effects of tax evasion, by simulating tax due under tax evasion and under full tax compliance and by comparing the outputs. This produced a series of interesting results. To start with, we found that the progressive structure of income taxation and the distribution of tax payers along the taxable income scale heighten the fiscal effects of under-reporting. More specifically, as shown in Table 3, income under-reporting by 10% to 12% results in a shortfall in terms of tax receipts of around 20% (Hungary and Italy) up to 26% (Greece).

Distributional effects may be seen as rather predictable, given the pattern of under-reporting by level of income discussed above. However, this is less true than it may appear. The results shown in Table 4 were computed on the basis of the distribution of equivalised household disposable income, while the results shown in Table 2 relied on the distribution of non-equivalised personal pre-tax incomes instead.

In spite of this important difference, we find that tax evasion causes inequality to rise relative to what would have been the case under full tax compliance. The estimated effect of tax evasion on inequality is highest for indices that are more sensitive to changes at high levels of income. Finally, the effects on tax progressivity and redistribution are estimated to be considerable, strongly suggesting that tax evasion renders the income tax system more regressive than its formal structure implies.

While our approach focuses on income tax, the distributional effect of evading other taxes (e.g. company tax, capital tax, value added tax) is likely to reinforce that estimated here. Can the same hold with respect to social contributions, often evaded at the same time as income taxes? Two effects operate here. On the one hand, since social contributions are paid at a flat rate in the case of employer and employee contributions, or as a lump sum in the case of contributions by the self-employed, while no lower earnings threshold typically applies (i.e. contributions are payable from the first €1 earned), the distributional impact of

contribution evasion may be less regressive than in the case of income tax. On the other hand, employer social contributions are formally higher than employee social contributions (twice as high in Greece, three times as high in Hungary and Italy), as a result of which unregistered work and incomplete reporting of wages will reduce employers' labour costs far more than will raise take-home workers' incomes. On balance, taking both effects into account, we believe that evasion of social contributions is more likely to reinforce rather than mitigate the distributional impact of tax evasion.

6. Conclusion

As shown above, the effects of tax evasion in Greece, Hungary and Italy seem to be higher income inequality and lower tax progressivity, as well as a significant loss of tax receipts. This is a strong finding, but is it to be trusted?

A cause for caution regards the distinction between static and dynamic effects of tax evasion. It is important to remember that taxation (and, by implication, tax evasion) does not simply reduce disposable incomes; it also affects decisions concerning supply of, and demand, for labour, the allocation of disposable income between consumption and savings, the allocation of consumption between different goods and services and so on (Slemrod and Yitzhaki 2002, Sandmo 2005). Although the analysis of such dynamic effects lies well beyond the scope of this paper, we need to recognise that the implications of tax evasion exceed what we can show with a static arithmetical recalculation of the income distribution.

Our approach relies on matching data from tax returns with income survey data. While we have made a serious effort to make the two sources comparable, our adjustment techniques offer at best good approximations. In particular, the truncated nature of tax records (i.e. low-income families pay no taxes) and the limited reliability of income statistics at either end of the income scale may cause residual estimation errors. Therefore, our

results should be seen as tentative estimates under an experimental research design. Clearly, the design itself can be improved further, e.g. by trying other approaches to matching the two databases, by repeating the analysis with a larger sample of tax returns, or by collecting more information, enabling us to create smaller, more homogeneous categories.

A possible refinement concerns the introduction of stochastic variation. Specifically, there is no reason to think that all members of a given category under-report their incomes by the same ratio: some will do so by a higher percentage, some by a lower one, while some others may even faithfully reveal their incomes to the tax authorities. Stochastic variation may involve introducing a random term around the estimated average rate of under-reporting by category. Again, this exceeds the scope of the current paper.

Even though the design of our work was experimental, the assumptions we have had to rely upon were sometimes crude, and several issues (some of which are discussed above) remained unresolved, we believe our results capture essential aspects of the problem we set out to explore. Our core finding (that tax evasion in the three countries causes inequality to rise, weakens tax progressivity, and leads to a loss in tax receipts) seems reasonably robust.

Moreover, the rather conservative character of our approach suggests that our results may be lower-bound estimates of tax evasion. After all, most of the studies reviewed earlier estimate a higher rate of tax evasion in the three countries. Under a higher actual rate of tax evasion, its distributional impact need not be more regressive than implied by our estimates – but is likely that it will be.

This is an important finding, with obvious policy implications. It suggests that the payoff of efforts to improve tax morale and reduce tax evasion could be very substantial indeed: higher tax receipts, lower inequality, and a more progressive tax system.

After all, it may be that the “egalitarian policy maker” invoked by Cowell (1987, p. 195) has little reason to “smile indulgently on evasion”, and every reason actively to engage in a sustained effort to reduce it. How this could be achieved is another story altogether.

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Tables

TABLE 1

Adjustment factors by income source and geographical area

| | wages and salaries | pensions | self employment | farming |
|--------------------------|--------------------|----------|-----------------|---------|
| Greece | | | | |
| Athens | 1.000 | 1.000 | 0.770 | 0.468 |
| Northern | 0.978 | 1.000 | 0.860 | 0.412 |
| Southern | 0.992 | 1.000 | 0.640 | 0.530 |
| Islands | 1.000 | 1.000 | 0.712 | 0.519 |
| Hungary | | | | |
| Central | 0.960 | n.a. | 0.211 | n.a. |
| Transdanubia | 1.000 | n.a. | 0.288 | n.a. |
| Great Plain and North | 0.992 | n.a. | 0.342 | n.a. |
| Italy | | | | |
| North West | 0.985 | n.a. | 0.512 | n.a. |
| North East | 1.000 | n.a. | 0.472 | n.a. |
| Central | 1.000 | n.a. | 0.405 | n.a. |
| Southern (incl. Islands) | 1.000 | n.a. | 0.466 | n.a. |

Note: The adjustment factors shown here, multiplied by survey incomes, are used to derive the distribution of reported incomes, i.e. those incomes assumed to be revealed to tax authorities and hence subject to income tax.

TABLE 2

Under-reporting by level of income

| | Greece | Hungary | Italy |
|---------------------|--------|---------|-------|
| decile 1 (poorest) | 9.9% | 8.5% | 2.6% |
| decile 2 | 10.4% | 6.7% | 2.0% |
| decile 3 | 11.2% | 11.6% | 5.0% |
| decile 4 | 5.1% | 8.5% | 6.5% |
| decile 5 | 5.7% | 6.7% | 6.7% |
| decile 6 | 7.0% | 7.3% | 4.1% |
| decile 7 | 7.9% | 7.4% | 5.5% |
| decile 8 | 7.3% | 9.2% | 7.6% |
| decile 9 | 6.8% | 8.7% | 10.7% |
| decile 10 (richest) | 14.7% | 15.7% | 20.8% |
| top 1% | 23.6% | 25.9% | 26.5% |
| top 0.1% | 19.3% | 38.9% | 39.5% |
| total | 9.9% | 10.9% | 11.4% |

Notes: Rates of under-reporting are computed as difference of survey income from reported income divided by survey income.

Reported incomes, defined as incomes revealed to tax authorities, have been adjusted for under-reporting using the adjustment factors by geographical area and income source shown in Table 1.

Income quantiles are constructed on the basis of the distribution of non-equivalised personal pre-tax incomes.

TABLE 3

Fiscal implications of tax evasion vs. full compliance

| | Greece | Hungary | Italy |
|-------------------|--------|---------|--------|
| reported income | -9.9% | -10.9% | -11.7% |
| taxable income | -10.3% | | -12.3% |
| tax due | -26.1% | -19.4% | -20.6% |
| disposable income | +2.7% | | +6.1% |

Notes: Proportional change in income and tax variables is defined as difference of full compliance from tax evasion divided by full compliance.

Income and tax variables are derived by running the tax-benefit model EUROMOD under the two assumptions of tax evasion and full compliance.

Tax evasion provides estimates of income tax variables assuming incomes are under-reported to tax authorities as implied by the adjustment factors shown in Table 1.

Full compliance provides estimates of the same variables assuming incomes are reported to tax authorities as observed in the survey.

Income and tax variables are expressed in terms of non-equivalised personal incomes.

TABLE 4

Distributional implications of tax evasion vs. full compliance

| | Greece | Hungary | Italy |
|--------------------------------|--------|---------|--------|
| poverty line (€ p.a.) | +1.0% | +3.4% | +3.7% |
| poverty rate (FGT $\alpha=0$) | +2.3% | -1.5% | +3.8% |
| poverty gap (FGT $\alpha=1$) | +1.6% | -2.8% | +4.6% |
| Gini | +3.5% | +6.8% | +5.5% |
| S80/S20 | +5.2% | +7.5% | +2.6% |
| Atkinson (e=0.5) | +7.2% | +17.9% | +11.5% |
| Atkinson (e=2) | +2.7% | +7.6% | +4.0% |
| Theil | +9.2% | +24.5% | +14.3% |
| Kakwani | -10.0% | -10.8% | -16.1% |
| Reynolds-Smolensky | -23.5% | -26.9% | -40.0% |
| Suits | -16.2% | -13.5% | -22.4% |

Notes: Proportional change in distributional indices is defined as difference of full compliance from tax evasion divided by full compliance, as explained in Table 3.

Distributional indices are derived on the basis of equivalised household disposable incomes.

The poverty line is set at 60% of median equivalised household disposable income, and is recalculated under full compliance and tax evasion.

Appendix

TABLE A.1

Income tax brackets and marginal tax rates

| | income brackets (€ p.a.) | | tax rate |
|-----------------------|--------------------------|--------|----------|
| | from | to | |
| Greece (2004) | 0 | 8,400 | 0% |
| | 8,400 | 13,400 | 15% |
| | 13,400 | 23,400 | 30% |
| | 23,400 | | 40% |
| Hungary (2005) | 0 | 6,046 | 18% |
| | 6,046 | | 38% |
| Italy (2002) | 0 | 10,329 | 18% |
| | 10,329 | 15,493 | 24% |
| | 15,493 | 30,987 | 32% |
| | 30,987 | 69,721 | 39% |
| | 69,721 | | 45% |

Notes: In Greece, in 2004 the personal allowance (i.e. the income bracket where the tax rate is zero) was set at €10,000 for employees or pensioners. The personal allowance was higher by €1,000 for tax payers with one child, by €2,000 for those with two children, and by €10,000 for tax payers with three or more children.

In Hungary, in 2005 a tax credit to wages and salaries was available up to a maximum value of €438 p.a. Also, the child tax credit varied with the number of children from €146 to €487 p.a., while a tax credit of €97 p.a. applied to cases of serious disability. Finally, pensions are not taxed.

In Italy, in 2002 tax credits were available for employees (worth up to €1,147 for incomes up to €6,197, with additions for those partly employed in the course of the year and/or employed in temporary jobs), for the self-employed (worth up to €573 for incomes up to €4,700), for pensioners (as for employees, with additions rising with age), for children and other dependent members of the household etc.

In all three countries, various other tax allowances and tax credits are applicable (and, where possible, have been simulated in EUROMOD).