

Tax compliance: when do employees behave like the self-employed?

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Abstract

Previous studies of the underreporting of income for tax purposes have used private employees as the benchmark to which other groups' compliance was measured. In this paper it is suggested that there are a number of circumstances when there will be an incentive for private employees and their employers to collude to understate employee wages and salaries for purposes of taxation. The existence of high marginal tax rates of income tax combined with high social security payroll taxes are the typical conditions that stimulate this behaviour. These conditions are present in North Cyprus. This paper examines a rich source of household consumption expenditure and income data for North Cyprus that allows one to separate out the consumption expenditures made by the self-employed, private employees and civil servants over specific periods of time. From the comparison of consumption expenditures on food by these three groups it is possible to estimate how much self-employed and the private employees understated their incomes as compared to the civil servants. It is found that in North Cyprus private employees understate their incomes by approximately the same proportion of their incomes as do the self-employed.

Keywords: Tax compliance, Employees, Employer, North Cyprus

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I. Introduction

A number of studies have compared the tax compliance rates of different groups of taxpayers within countries. It has been consistently found that in industrialized countries, the largest disparity in the rate of tax compliance is between public and private sector employees on one hand and the self-employed, small businesses and farmers on the other (Lang et al., 1997). In all countries, taxing small businesses and the self-employed is difficult. One reason is that the burden of tax compliance rests particularly heavily on small businesses (Bird et al., 1995). According to a studies of the value added tax (VAT) in the UK, compliance costs of small firms were proportionally 260 times greater than those of the largest firms (OECD, 1994, p. 107), and for Canada, the cost of withholding income taxes, social security taxes, and unemployment insurance falls from 3.36% of gross business income for small employers to 0.064% for large employers (Vaillanancourt, 1989, pp. 50–51). In these situations the reform of the tax income tax laws and the tax administration is often focused on ways to reduce the compliance costs and incentives for tax evasion by the small business and self-employed groups (Wallschutlky, 1991).

In Italy, where tax evasion is higher than in most other industrialized countries, small businesses can adopt a simplified accounting procedure that permits only certain expenses against gross revenues (Zanardi, 1996). Other European countries, including Belgium, France, Spain and Greece, apply a simplified system for calculating income taxes payable by small business. In France, unincorporated small and medium-sized enterprises are subject only to a lump-sum tax when their turnover is less than French Frank (FF) 500 000 from the sale of goods, and FF150 000 from other activities (Blotnicki and Heckly, 1994, p. 1483).

In the last decade efforts to develop market based tax systems in the CIS and Central European countries have been stymied by problems created by the excessive taxation of the incomes of private employees. The aggregation of the burdens of income taxes, social security contributions, and compulsory pension contributions have resulted in very high statutory marginal and average tax rates. When the combined statutory rates reach a certain point, the private sector employers and their employees simply enter into an understanding to report a minimum salary and get paid the rest of their compensation in cash without recording their payments.¹ This behaviour is more common in those economies where small and medium businesses dominate the private sector's economic activities. When private sector employment is dominated by large publicly owned companies, such arrangements are more difficult to implement. However in a number of CIS countries, tax evasion at the employee level is achieved by the larger firms hiring their workers through contracts with smaller enterprises. These contract workers operate in every way like employees except they receive their income via contractors where tax evasion is easier to practice.

The damage to the tax system goes well beyond the personal income tax system. Because of the underreporting of labour costs there now will be an overstatement of business taxable income. To correct this problem the firms must make unrecorded sales via cash transactions. However, the practice of making cash sales means that the domestic value added taxes will also be underreported. Hence the final result of the very high marginal and average tax rates on employees is to destroy, not only the personal income tax system, but also the business income tax and the domestic value added tax as well. This phenomenon is not unique to the CIS and Central

European countries. It has existed in many Latin American countries for decades and exists now in countries such as Turkey and North Cyprus.

In the future the burden of income taxes and social security on the wages and salaries of private employees may arise in the countries of Western Europe as they are forced to raise the level of their payroll taxes in order to pay for their pay-as-you-go public pension systems (Bovenberg, 2002). When the problem of tax evasion on the wages and salaries and social security contributions of private employees becomes critical, then very difficult measures will need to be taken to enhance compliance. This will involve a reduction in the statutory rates of income tax and the funding of the social security system in ways other than through payroll taxes.

In a recent article, Boadway *et al.* (2002), develop a theoretical model of joint tax evasion where two or more taxpayers collaborate to evade taxes. This is exactly the situation that arises when employees and employers collaborate to evade payroll taxes. In their model, a key determinant of the degree of tax evasion is the ability of each of the participating agents to commit to undertake the cooperative level of avoidance activity. Hence, we would expect that the degree of evasion of taxes on wages and salaries would be higher in privately owned companies than in public companies that are subject to more stringent accounting and reporting rules. In the extreme, government employees who wish to evade such taxes are facing other government administrators who have no incentive to assist in the evasion of taxes that are owed by other employees.

II. Personal Income Rates and Underreporting of Income in North Cyprus

North Cyprus is a small middle-income country with a population of about 200 000 and a per capita income of about US\$6000/annum. Since the middle of the 1990s, due to inadequate indexation for inflation and increases in the social security contributions, the combined marginal tax rates on private employees has risen to a maximum of 41% for individuals and up to 49% when the employer's contribution to social security is combined with the personal income taxes and social security contributions paid by the employee (Jenkins, 2001). A critical feature

¹ Often the motivation to declare some income is to obtain the length of source credits for social security and perhaps to avoid harsh treatment by the tax administration if caught.

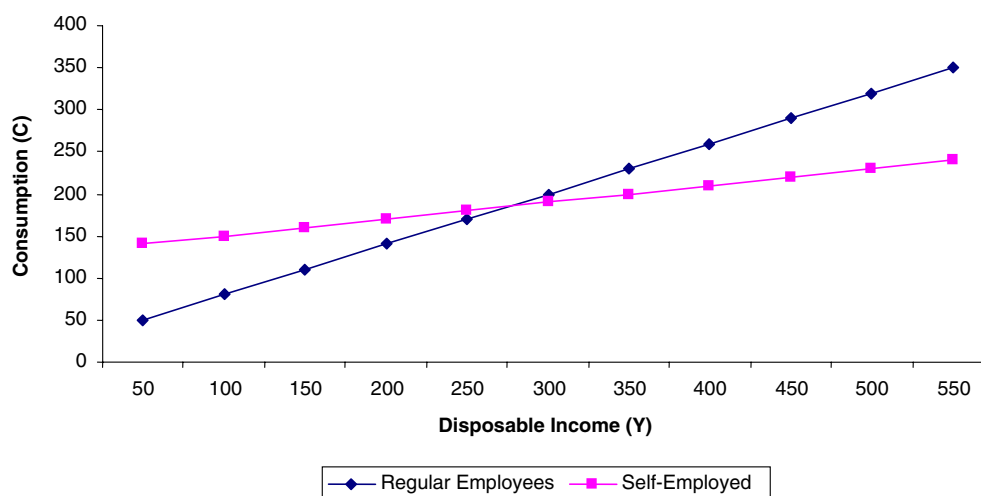


Fig. 1. Consumption functions for self-employed and regular employees

of the situation in North Cyprus is that these high theoretical marginal tax rates are reached when an individual's gross income is only about US\$10 000.² This escalation of marginal tax rates has created difficulties for the tax administration to maintain an acceptable level of tax compliance. As a consequence it is often rumoured that private employees and their employer collude to evade personal and corporate income taxes and social security contributions.

Until now it has been difficult to measure the level of tax evasion of private employees except by undertaking comprehensive tax audits of individuals. Fortunately, the rich statistical information provided by the 1998–1999 Households Consumption Expenditure Survey (HCES), State Planning Organization (SPO), 2000 in North Cyprus, allows us to estimate the incidence of underreporting of income among the private sector employers as well as the combined population of the small business and self-employed taxpayers.³ In this study we measure the relative degree of underreporting by private employees and self-employed individuals as compared to government employees. While the HCES data does not directly report incomes declared for taxation, it is likely that the respondents would

reply to the HCES survey in a consistent fashion. There certainly appears to be no incentive for the respondent to underreport more on the HCES than they do on their income tax. The results of this analysis are relevant for situations that are well beyond the particular case of North Cyprus. Private employees and employers are likely to respond to high marginal tax rates in a similar fashion anywhere. This analysis will give us some indication of the potential for this type of behaviour in such circumstances.

III. Methodology

The approach taken in this paper is to draw inferences from the comparison of the expenditures patterns of households that are either self-employment or receive wages and salaries from the private sector with those of the public sector employees.⁴

The approach is based on the estimation of the relationships between reported disposable income levels (Y) and consumption expenditures on particular goods (C), as shown in Fig. 1. The relationships show that on average households with higher

² By way of comparison South Cyprus exempts the first US\$12 000 of income from personal taxation. Belize another micro-state and former British Colony with a per capita income of about \$3500 exempts the first US\$10 000 from personal income tax. Both of these countries collect about 25% of GDP through all their tax combined.

³ There are certain limitations due to our data. The study will base its findings on the households that have taken part in the HCES and have to base its estimates on what they have chosen to tell the survey. In both respects, it is reasonable to suspect that we may not be getting the complete picture of the extent of the undeclared income. People who are heavily involved in tax evasion may simply fail to respond to the HCES, perhaps because they do not believe the confidentiality assurances that are given, and fear that the information they give to the survey may somehow find its way back to tax authorities. Other people, whilst responding to the survey, might nonetheless be aware of the implications of appearing to live beyond their means, and might adjust the amount of expenditure they report accordingly.

⁴ The methodology used here is similar to that employed by British, Swedish and Canadian data (Pissarides and Weber, 1989; Apel, 1994 and Mirus and Smith, 1997) on British, Swedish and Canadian data respectively.

incomes, have a higher level of spending on various groups of commodities. Also, the characteristics of the household such as the number of the adults and children in the household, the age of the head of the household, will affect consumption behaviour.

It is likely that government employees will have fewer opportunities to conceal their income than do private sector employees. Civil servants have taxes withheld monthly from their salaries by the government administration and the likelihood of being detected is high if some government employees tried to get other government employees to underdeclare this taxable income. In previous studies of tax evasion, the analysis has always been made between the self-employed and the combination of government employees and private employees. In this study, we are able to segregate the government employees from the private sector employees.⁵

Equations for household consumption expenditures on food are estimated. Food expenditures were selected, as they are likely to represent one of the most stable relationships between income and consumption expenditures. Both the intercept term and the marginal propensity to consume out of reported disposable income will be estimated separately for:

- (a) self-employed and government employees, and
- (b) private employees and government employees.

In addition, quite apart from the question of unreported income, we might expect the income/expenditure relationships for self-employed to differ from those of regular employees (public and private), because of the greater variability and uncertainty of self-employed income. The pattern of food consumption for a self-employed household with highly variable incomes might not be expected to follow closely their level of current income, but to reflect instead the long-term average income that the household expects ('permanent income'). Hence, we would expect to find that they have a lower estimated marginal propensity to consume out of current income than the case of employees receiving wages and salaries.⁶

The relationship between food consumption and reported disposable income is estimated here as:

$$\ln food = aZ + cX + (b + dX) \ln Y_d^R \quad (1)$$

where

$\ln food = Z$ = household characteristics (number household members, age of the head of household)

X = is a dummy variable with a value of 1 if head of household is self-employed and a value of 0 if a government employee, when we are comparing the consumption function behaviour of these two groups. Alternatively, it takes a value of 1 if head of household is private sector employees, and a value of 0 if it is a government sector employee, when we are comparing the consumption behaviour of these two groups.

Y_d^R = $\ln$ (annual reported disposable income)

a , c , b and d are the estimated coefficients.

From the estimated relationship between the levels of food consumption and disposable income for those who are government employees, one can then derive the true level of disposable income for the self-employed and private sector employee household groups that would be consistent with their actual food consumption.

For the self-employed (SE) and private sector employees (PE) Equation 1 becomes:

$$\ln food^{SE} = aZ + c^{SE} + (b_1 + d^{SE}) \ln Y_d^R \quad (2)$$

$$\ln food^{PE} = aZ + c^{PE} + (b_1 + d^{PE}) \ln Y_d^R \quad (3)$$

For the civil servants (SS), Equation 1 becomes:

$$\ln food^{SS} = aZ + b_1 \ln Y_d^R \quad (4)$$

While the estimated marginal propensity to consume for the self-employed is $b_1 + d^{SE}$, the true marginal propensity to consume for the self-employed out of permanent income is simply equal to b_1 , the marginal propensity to consume of civil servants. If the self-employed and the civil servants have fundamentally the same food consumption behaviour with respect to the level of permanent income, we can express the level of consumption of the self-employed C_{SE}^* at their average level of income ($\bar{Y}_{dSE}^R$) as follows:

$$C_{SE}^* = a_1Z + c^{SE}X + (b_1 + d^{SE}) \ln \bar{Y}_{dSE}^R \quad (5)$$

Recognizing that their true marginal propensity to consume is b_1 , when measured with respect to average

⁵ For the HCES survey data to be fully applicable for addressing questions concerning tax evasion the respondents need to report to the Survey the same level of income they have reported on their tax return, and the same expenditure patterns exist for food (*ceteris paribus*), whether one is self-employed or a private sector employee. Given the fear of self incrimination, it is likely that most people will report incomes similar to the level they reported to the tax authorities.

⁶ This well established empirical observation was initially developed by, Milton Friedman (1957).

true or permanent income $\bar{Y}_{dSE}^T$, Equation 5 can be expressed as

$$C_{SE}^* = a_1 Z + b_1 \ln \bar{Y}_{dSE}^T \quad (6)$$

Equating Equations 5 and 6 we obtain:

$$a_1 Z + b_1 \ln \bar{Y}_{dSE}^T = a_1 Z + c^{SE} + (b_1 + d^{SE}) \ln \bar{Y}_{dSE}^R$$

which becomes:

$$\ln \bar{Y}_{dSE}^T - \ln \bar{Y}_{dSE}^R = c^{SE} + d^{SE} \ln \frac{\bar{Y}_d^R}{b_1} \quad (7)$$

Equation 7 is the expression that measures the amount that reported income is understated by the self-employed at the average level of the reported income.

An alternative way we can econometrically estimate the consumption function for the pooled group combining both the self-employed and the civil servants is as follows:

$$\ln food = a_2 Z + c_2^{SE} X + b_2 \ln \bar{Y}_d^R \quad (8)$$

For the pooled group of the private employees and civil servants we have:

$$\ln food = a_3 Z + c_3^{PE} X + b_3 \ln \bar{Y}_d^R \quad (9)$$

In Equation 8, the coefficient c_2^{SE} on the dummy variable X , captures the mean of the differences in the level of consumption of the self-employed for the same level of reported income as a civil servant. As b_1 from Equation 2 is the true marginal propensity to consume for the self-employed, we can measure the average gap between the true permanent income of the self-employed and the level as:

$$\ln \bar{Y}_{dSE}^T - \ln \bar{Y}_{dSE}^R = \frac{c_2^{SE}}{b_1} \quad (10)$$

The corresponding expressions for the measurement of the gap between the true permanent income of the private employees $\bar{Y}_{dPE}^T$ and their unreported income $\bar{Y}_{dPE}^R$ are as follows:

$$\bar{Y}_{dPE}^T - \bar{Y}_{dPE}^R = c_2^{PE} + d^{PE} \ln \frac{\bar{Y}_d^R}{b_1} \quad (11)$$

or

$$\ln \bar{Y}_{dPE}^T - \ln \bar{Y}_{dPE}^R = \frac{c_2^{PE}}{b_1} \quad (12)$$

We now turn to the estimations of the coefficients for Equations 2, 3, 8 and 9, and the evaluation of the level of underreporting of income given by Equations 7, 10, 11 and 12.

IV. Data

The unit of analysis for the *Household Consumption Expenditures Survey Results 1998–1999* (HCES) is the family. The sample size was 3792. This means that out of 45 009 households in the country 8.4% of them were surveyed. The HCES was recorded over a period of one year.

Self-employed

The HCES defines the self-employed as ‘a person working, by himself or together with unpaid family workers to obtain an income in cash or in kind’ (SPO, 2000, p. xxii). The HCES asks each member of the household 15 years and older about the sources of income and the amounts earned. Those spending units where head of the household and spouse derived all of their after tax income from self-employed activities resulted in a total of 184 observations amongst the 3792, representing 4.8% of the whole sample.

Private sector employees

In this study we were able to differentiate public employees from private sector employees. In total there are 723 households in the survey who obtain all their income from employment of which 314 are private sector employees and rest 409 are civil servants. Hence, in total our data set consisted of 907 observations of household income and expenditure patterns.

V. Results

In Table 1 we report the results of our OLS estimation of Equations 2 and 8, while in Table 2 we report our estimation of Equation 3 and 9. In all cases the coefficients on the explanatory variables exhibit the correct signs and are statistically significant at the 5% level or better. In Table 1 Equation 2, the dummy variables indicating the differences between the self-employed and civil servants are both significant with respect to the intercept as well as on the coefficient estimating the marginal propensity to consume food. The same situation holds true for the significance of the dummy variables in Equation 3 in Table 2 that differentiation between private employees and civil servants. As expected though, coefficient c on the dummy variable explaining the difference in the intercept is less than half as large for the case of the private employees as compared to that of the self-employed. The reason for this observation is that private employee wages and salaries are expected

Table 1. Consumption equations, 1998–1999: self-employed

Equation number	Dependent variable: expenditure on:	Constant Z_a	Self-employed (SE) c	Disposable income Y_d b	$Y_d * SE$ d	Adjusted R^2
2	Food	6.007 (6.803)**	3.793 (2.870)*	0.612 (13.642)**	−0.191 (−2.815)*	0.31
8	Food	7.651 (11.486)**	0.0745 (2.717)*	0.528 (15.618)**		0.30

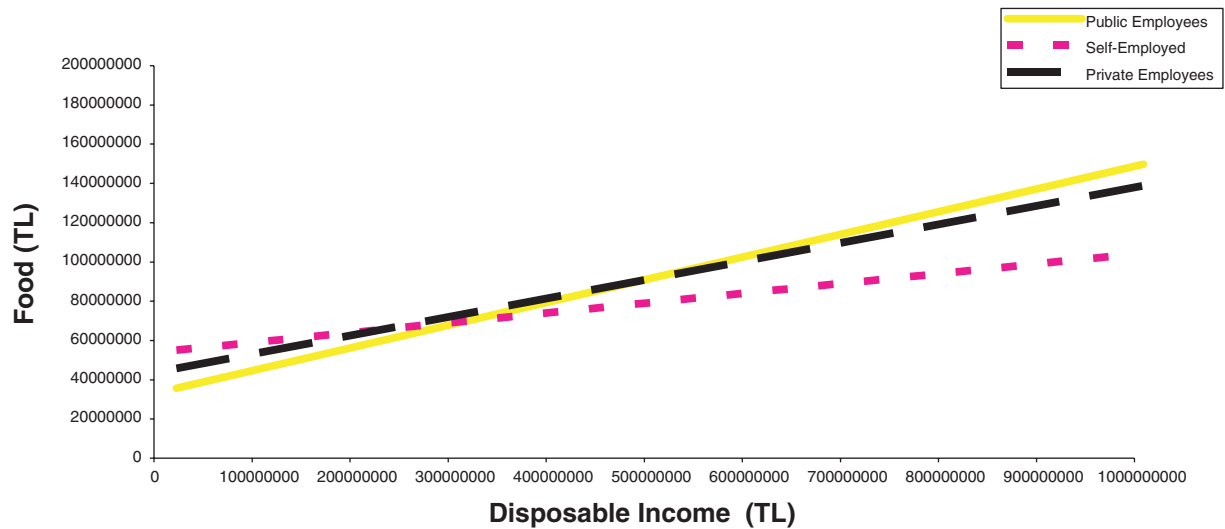


Fig. 2. Relation between food and disposable income

to fluctuate much less than that of the self-employed but more than the incomes of the civil servants. The coefficient d on the dummy variable explaining the difference between the marginal property to consume food by the private employees as compared with civil servants is also less than half of the counterpart coefficient for the self-employed in Table 1. There results are shown graphically in Fig. 2.

Each of these equations represents two consumption functions. Using the consumption function Equation 2:

$$\ln food = Za + cX + (b + dX)Y_d$$

where, c and d represent the key coefficients for self-employed in the first table, and for private sector employees in the second table. By using the estimated parameters, the intercept of the consumption function for food and the MPC can be determined for each group.

Analysing self-employed against civil servants (CS)

When $X = 1$ for self-employed (Equation 1):

$$\ln food_{SE} = 6.007 + 3.793 + (0.612 - 0.191)Y_d$$

and

when $X = 0$ for civil servants:

$$\ln food_{CS} = 6.007 + 0.612Y_d$$

Comparison of intercept term

The size of the intercept $SE = Za + b_1 X$, hence,

$$\text{Intercept}_{SE} = 6.007 + 3.793 = 9.8$$

and

$$\text{Intercept}_{CS} = 6.007$$

Self-employed happen to have a higher intercept for the estimated consumption function as compared to civil servants.

Comparison of MPCs

$$\text{MPC}_{SE} : 0.612 - 0.191 = 0.421$$

$$\text{MPC}_{CS} : 0.612$$

The MPC of the self-employed, because of the variability and uncertainty about income, is lower than for the civil servants.

Table 2. Consumption equations, 1998–1999: private sector employees

Equation number	Dependent variable: expenditure on:	Constant Z_a	Private sector employee (PRE) c	Disposable income Y_d b	Y_d * PRE D	Adjusted R^2
3	<i>Food</i>	6.007 (6.776)**	1.570 (2.313)*	0.612 (13.586)**	−0.075 (2.242)*	0.33
9	<i>Food</i>	6.819 (11.378)**	0.0853 (2.542)*	0.571 (18.75)**		0.33

Notes: Values in parenthesis are t statistics.

*Significant at 0.05.

**Significant at 0.01.

Comparing private sector employees (PE) with civil servants (CS)

When $X = 1$ for private sector employees:

$$\ln food_{PE} = 6.007 + 1.570 + (0.612 - 0.758)Y_d$$

and

when $X = 0$ for civil servant:

$$\ln food_{CS} = 6.007 + 0.612Y_d$$

Hence we find that:

$$\text{Intercept}_{PE} = 6.007 + 1.570 = 7.577$$

$$\text{Intercept}_{PE} = 6.007$$

Private sector employees happen to have a higher intercept in their consumption function for food as compared to civil servants.

When the MPCs are compared:

$$\text{MPC}_{PE} : 0.612 - 0.0758 = 0.5362$$

$$\text{MPC}_{CS} : 0.612$$

Hence, $\text{MPC}_{CS} > \text{MPC}_{PE}$

The key parameters differentiating PE from CS are all significant from zero.

VI. Estimation of the Degree of Underreporting of Income

Using the Equations 7 and 10 gives us two alternative estimates of the gap reflecting the degree of underreporting. From Equation 7 we estimate this gap for the self-employed at the average level of income of the self-employed as:

$$\ln Y_{dSE}^T - \ln avr Y_{dSE}^R = c^{SE} + d^{SE} \ln \frac{Y_d^R}{b_1}$$

$$\ln Y_{dSE}^T - 19.53 = 3.793 - \frac{0.191(19.53)}{0.612}$$

$$\ln Y_{dSE}^T = 19.63 \dots \text{anti-log} = 335,981,000 \text{ TL}$$

This is approximately 11% higher than the average level of reported monthly income by the self-employed to the HCES.

Using the estimates from Equation 8 and expression (10) for the alternative measure of the gap we have:

$$\ln Y_{dSE}^T - \ln Y_{dSE}^R = \frac{c_2^{SE}}{b_1}$$

$$\ln Y_{dSE}^T - 29.53 = \frac{0.0745}{0.612}$$

$$\ln Y_{dSE}^T = 19.65 \dots \text{anti-log}$$

$$\ln Y_{dSE}^T = 341,890,000 \text{ TL}$$

This is approximately 12.7% more than the average monthly income reported by the self-employed to the HCES.

Extending this approach to the estimation of the income reporting gap between private employees as compared to civil servants, we have from the Equations 3 and 9 in Table 2 and expressions (11) and (12) that:

$$Y_{dPE}^T - Y_{dPE}^R = c_2^{PE} + d^{PE} \ln \frac{Y_d^R}{b_1}$$

$$Y_{dPE}^T - 19.62 = 1.570 - \frac{0.075(19.62)}{19.62}$$

$$Y_{dPE}^T = 19.71 \dots \text{anti-log}$$

$$Y_{dPE}^T = 366,130,000 \text{ TL}$$

This is approximately 9.7% more than the average monthly income reported to the HCES by private employees.

$$\ln Y_{dPE}^T - \ln Y_{dPE}^R = \frac{c_2^{PE}}{b_1}$$

$$\ln Y_{dPE}^T - 19.63 = \frac{0.0853}{0.612}$$

$$\ln Y_{dPE}^T = 19.75 \dots \text{anti-log}$$

$$\ln Y_{dPE}^T = 381,407,000 \text{ TL}$$

This is approximately 14.2 % more than the level of income reported to the HCES by the private employees.

These estimates indicate that the self-employed underreport their income to the household survey

by between 11 and 14%. As our sample includes to private employees who work for public companies as well as those who work for private companies, it is likely that our estimate of the degree of underreporting will be overstated for those working in public companies and understated for those working for private companies. Yet it is interesting to find that the estimates of the average degree of underreporting of private employees is very similar to our estimate for the self-employed, with between 9.7 and 14.2 percent of income underreported.

VII. Conclusions

The results of this study indicate that under certain conditions the underreporting of income by private employees can be as widespread and severe as in the case of self-employed. This pattern of behaviour has arisen in North Cyprus where the economy is dominated by small and medium sized enterprises, and where there are very high statutory marginal tax rates on wages and salaries. The high tax rates are the aggregation of the rate of income tax, social security payroll taxes and provident fund contributions. Given the pay-as-you-go social security system, high rates of inflation, and economic instability, employees and their employers do not see how they will directly benefit from paying more taxes. Hence, they make the necessary arrangements to underreport the wage and salary payments to evade taxes.

Such behaviour has important implications for the efficient operation of both labour markets and capital markets. When reported wage rates are not accurate, with side agreements being made between the employers and employees, then a gap will develop between the tax treatment in this part of the economy and that in the public sector and employees of large public companies where such arrangements are more difficult or impossible to make. This lack of transparency not only complicates the employer–employee relationship but leads to inequities in the social security and pension systems between different sectors in the economy.

The implications for the efficiency of the capital markets are similar. When financial accounts are falsified for reporting to the tax authorities, it is more difficult to produce creditable financial reports for the purpose of obtaining loans or equity financing. Hence, loans tend to be made based on the strength of collateral provided, and not on the expected size of the cash flows generated by the investments as this

would require the presentation of reliable financial reports. Such constraints restrict the access of businesses to certain methods of financing that would be beneficial to them, and hence impedes their growth.

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