Measuring Tax Evasion on Microeconomic Level: An Empirical Study on Iraqi Stock Exchange

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Abstract

Allingham and Sandmo put the first model at 1972, this model measuring the "Maximize Utility Expected" from the taxpayer's point of view (Allingham, 1972), but this is not entirely realistic (KOLM, 1973). Thus, Yitzhaki added modifications to the Allinghams' model (Yitzhaki, 1974), where the original model includes tax rate, probability of data checking, fine, declared income and real income (Hussein, 2016).

In this paper, the researchers presented an alternative model based on the relationship between the tax amount paid with the current activity revenues, and on the other hand with the costs of the current activity by applying the model to the Iraqi Stock Exchange, the researchers found significant relation in Bank and Insurance sectors studied, the tax evasion rate reached to (39%) in Bank sector, while the tax evasion rate reached to (13%) in Insurance sector.

I) Introduction

We consider that the tax in the economic and political development is the modern state instrument of financial policy tools, no longer limited its role to achieve the financial goal only, but has expanded its objectives to include other economic and social goals. Therefore, it is necessary to pay attention to the problem of tax evasion that is inherent to the tax system experienced by countries, but it is difficult to determine the value of taxes evaded annually.

Tax evasion leads to a violation of equality and justice among the taxpayers. While taxpayers (who are committed to paying their taxes) pay due to their satisfaction of their tax commitments, while others are evading it, moreover, the state needs more money to finance its planned projects,

they impose new taxes or raise current taxes, which increases tax burdens on taxpayers (who are committed to paying their taxes), and may also make them evade tax too.

Thus, increasing interest in measuring tax evasion and trying to identify tax evaders to reduce the rate of evasion to the minimum, and hence the researchers put many mathematical models (rather than measure evasion through the questionnaire), most models measure tax evasion at the macroeconomic level, but in the first interesting research in microeconomic level for Allingham and Sandmo in 1972, then Yitzhaki in 1974 introduced amendments to the Allingham model. The focus of this model was on the idea of measuring the maximization of the expected utility from the point of view of taxpayers.

II) Literature Review

Allingham model use the taxpayer's point of view, it's suppose that an individual is assumed to receive a fixed amount of income (*I*), and must choose how much of this income to report to the tax authorities, and how much to underreport (Alm, 2012: 60). Allingham reached a conclusion that the taxpayer will declare less than his actual income if the expected tax payment on undeclared income is less than the regular rate (Allingham, 1972).

KOLM tried to review Allingham's model, he thinks that this is hardly public economics, in fact, it is very private, then he reached to his opinion that the tax authorities "are not really interested in an individual taxpayer’s expected tax yield"(KOLM, 265, 1973). Yitzhaki has shown that the substitution effect disappears so that a higher tax rate will increase reported income via the income effect, this prediction is often at odds with the actual evidence (Yitzhaki, 1974).

FREY found that Spain's tax morality was lower than the average for 17 OECD countries. The study used this classification and several other factors to estimate the size of the shadow economy. FREY also suggested that the size of the shadow economy is likely to be small for the United States and uncertain for Spain. (FREY and WECK-HANNEMAN, 1984).

Cowell discussed tax evasion and the shadow economy, and developed microeconomic models that seek to explain the reason for tax evasion, it carefully demonstrates evasion and reflects the influence of the

hidden economy, especially when it is influential in evasion. Cowell provides a model for interaction between the legal private sector, the hidden economy and the public sector in risk-related decision-making. He explains this model in different directions and examines how evasion behavior changes due to changing policies on tax rates, audit rates, and penalties. Cowell also takes into consideration what could be the ideal policy regarding evasion, using a model as the main tax agency agent for taxes. (Cowell, 90)

Alm developed a model for assessing the behavior of individual tax compliance, the model recognizes the importance of marginal income tax rates, contributions and tax benefits in payroll, and the possibility of disclosure and penalty for unpaid taxes. The results indicate that taxation rises with higher benefits for payroll tax contributions and decreases with higher marginal tax rates. The rule also includes more severe penalties and more disclosure of evasion as a substitute for income avoidance. (Alm, 90)

Alm tried to explore the main factors (economic and non-economic) that affect tax compliance: Detection and punishment, tax burden, provision of public goods, overweight and low probability, social standards. The results indicate that all these factors have a significant effect on tax compliance. More importantly, the role of social standards in compliance is examined by comparing compliance experiences administered in different countries (Spain versus the United States), countries whose culture and date of compliance vary considerably. These comparisons show that the level of compliance varies from country to another, providing evidence that societal attitudes towards tax compliance have a significant impact on individual behavior. Overall, Alm's results suggest that a government compliance strategy based solely on disclosure and punishment may be a reasonable starting point but not a good endpoint. (Alm, 95)

Therefore, the hypothesis of the study will be as follows: The average tax evasion varies by industry (banks, insurance, industry, investment).

III) Design the model

We found in the previous studies (Allingham 1972, Yitzhaki 1974, Cowell 90, Alm 90 and Alm 95) that the focus on the idea of maximizing the expected benefit from the point of view of taxpayers is sometimes difficult to measure, and sometimes unrealistic, we turned to the idea of

measuring the tax commitment. If we can measure the tax commitment[1], it will be easy to measure the tax evasion, which will be an accounting complement to it.

In order to measure the tax commitment, the previous studies (Allingham 1972 and Yitzhaki 1974) were unable to find a better way than the linear relationship between the value of the tax paid and the revenue of the current activity on the one hand and the costs of the current activity on the other. In order for the relationship to be highly linear (we know the impossibility of the relationship being 100%), the model will depend on the following hypothesis:

1. The relationship with the revenue of the current activity is liner (After excluding incidental income items).
2. The relationship with current activity costs is linear (variable costs only).
3. No exceptional circumstances or other emergencies beyond the control of the Company.

The model will be built as follows:

The tax (T) payable is usually founded after the tax rate (r) is multiplied by the net income (by deducting cost "C" from revenue "R") as follows:

$(R - C) * r = T$ …………………………………….……… 1

Or the tax rate can be multiplied by the cost value directly and deducting from the revenue (multiplier by the same tax rate), according to the following equation:

$(R * r) - (C * r) = T$

$R*r - C*r = T$ ………..………………………………………. 2

Under the assumptions of the previous equation, any change in income would be offset by a similar change in the amount of the tax (as well as for the costs), and the equation would be as follows:

$$\blacktriangle T = \frac{r * (\blacktriangle R + \blacktriangle C)}{2} \quad \text{……………………… 3}$$

Equation 3 will represent the "Tax Commitment" equation of the taxpayers. The complement amount of Equation 3 is the tax evasion ratio, as follows:

[1]Tax Commitment: Previous studies did not indicate the tax commitment, so the researchers could not build equation on a previous equation or hypothesis tested.

$$\text{Tax Commitment Ratio} = \frac{CT + RT}{2} \quad \ldots\ldots\ldots 4$$

What should be paid from a realistic and objective tax, when reducing the evasion rate of the optimal percentage of the tax amount will result in the amount of this commitment:

1 – Tax Commitment = Tax Evasion …… 5

By substitute equation 4 in equation 5, the equation for measuring evaporation ratio is as follows:

$$\text{Tax Commitment Ratio} = 1 - \frac{CT + RT}{2} \quad \ldots\ldots\ldots 6$$

IV) Results

The following tables show that there is a difference in terms of revenue and tax evasion relation on the one hand and the tax evasion relationship with the cost on the other hand for the listed companies in the Iraqi Stock Exchange[2]. However, this generally indicates a positive correlation. Therefore, Tax evasion due to the variation of the linear relationship with the actual reality.

Table 1 shows that the variation in the industrial and investment sectors is insignificant and cannot be adopted as a result for now. The rest of the results indicate a low rate of evasion in the insurance sector at 12.7% and a high rate of evasion in the banking sector at 38.6 %.

Table (1) Tax evasion rate for the four sectors

Details	The relationship between tax and revenue	The relationship between tax and cost	Average	Rate of evasion	Significant
Banks (X1-X6)	0.559867	0.668185	0.614026	0.385974	0
Insurance (X7-X9)	0.884416	0.861588	0.873002	0.126998	0
Industry (X10-X11)	0.383669	0.268921	0.326295	0.673705	0.226
Investments (X12-X14)	0.968275	0.021186	0.4947305	0.5052695	0.907

Source: prepared by researchers, the adoption of the Iraq Stock Exchange Data (http://www.isx-iq.net)

As for the sectors discussed separately, in Table (2) for the banking sector, we find that all relations significant in selected six banks, have found that the bank (X3) was less extreme worth in terms of tax evasion for the rest of the banks at a rate of 6.47%, While the bank (X2) was the highest value also in terms of evasion rate of 36.8%, while the rest of the banks represented by (X1), (X4), (X5) and (X6) was the rate of tax evasion in which varied between 10% To 18%.

Table (2) Tax evasion rate for the banking sector

[2] By used data in the Iraq Stock Exchange Data (http://www.isx-iq.net)

Details	The relationship between tax and revenue	The relationship between tax and cost	Average	Rate of evasion	Significant
X1-X6	0.559867	0.668185	0.614026	0.385974	0
X1	0.905377	0.894054	0.8997155	0.1002845	0
X2	0.741396	0.522122	0.631759	0.368241	0.099
X3	0.982965	0.887666	0.9353155	0.0646845	0
X4	0.877059	0.762206	0.8196325	0.1803675	0.01
X5	0.99177	0.759743	0.8757565	0.1242435	0.011
X6	0.957785	0.784731	0.871258	0.128742	0.007

Source: prepared by researchers, the adoption of the Iraq Stock Exchange Data (http://www.isx-iq.net)

Table (3) related to the insurance sector shows that the relationship is insignificant for the insurance company (X7). It was significant in the insurance company (X8) with a high evasion rate of 25.8% and the insurance company (X9) with a rate of 3.81%.

Table (3) Tax evasion rate for the insurance sector

Details	The relationship between tax and revenue	The relationship between tax and cost	Average	Rate of evasion	Significant
X7-X9	0.884416	0.861588	0.873002	0.126998	0
X7	0.430738	0.025096	0.227917	0.772083	0.945
X8	0.759309	0.725749	0.742529	0.257471	0.011
X9	0.875195	0.84734	0.8612675	0.1387325	0.001

Source: prepared by researchers, the adoption of the Iraq Stock Exchange Data (http://www.isx-iq.net)

As for the industrial sector, Table (4) shows that the relationship is insignificant for both X10 and X11, although evasion is high at 42.3% and 57.5%, respectively.

Table (4) Tax evasion rate for the industrial sector

Details	The relationship between tax and revenue	The relationship between tax and cost	Average	Rate of evasion	Significant
X10-X11	0.383669	0.268921	0.326295	0.673705	0.226
X10	0.664474	0.48947	0.576972	0.423028	0.126
X11	0.436693	0.411763	0.424228	0.575772	0.208

Source: prepared by researchers, the adoption of the Iraq Stock Exchange Data (http://www.isx-iq.net)

Table (5) related to the investment sector shows that the relationship is insignificant for all companies in the research sample (X12, X13 and X14), although evasion is high by 25.3%, 44.1% and 42.6%, respectively.

Table (5) Tax evasion rate for the investment sector

Details	The relationship between tax and revenue	The relationship between tax and cost	Average	Rate of evasion	Significant
X12-X14	0.968275	0.021186	0.4947305	0.5052695	0.907
X12	0.96584	0.528526	0.747183	0.252817	0.095
X13	0.990655	0.127444	0.5590495	0.4409505	0.709
X14	0.96856	0.179046	0.573803	0.426197	0.598

Source: prepared by researchers, the adoption of the Iraq Stock Exchange Data (http://www.isx-iq.net)

V) Examining differences in tax evasion according to different sectors

Hypothesis: The average tax evasion varies by sector (banks, insurance, industry, investment)

Tables (6), (7) and (8) To test the hypothesis can be used (Kruskal-Wallis), where the results confirm the absence of a difference in the average tax evasion in different industrial sectors (banking, insurance, industrial, investment)

Where the value of the significant (0.069), which is greater than (5%), while the value of Chi-Square is (7.095238) at the degree of freedom amounted to (3), which confirms the rejection of the main assumption and accept the alternative hypothesis, stipulates that the average tax evasion varies by industry (banks, insurance, industry, investment).

Table (6) Results of the Kruskal-Wallis test between sectors

Sector	Mea	Chi-Square	Sig.
bank	4.17	7.095	0.069
Insurance	9		
industrial	11.5		
Investment	10		

Source: prepared by researchers, the adoption of the Iraq Stock Exchange Data (http://www.isx-iq.net)

Conclusion

For testing hypothesis, we used (Kruskal-Wallis), it is a Non-Parametric Data to exam the differences between groups, the results confirm that there is no difference in the average tax evasion by different industrial sectors (banks, insurance, industrial, investment), Where the value of the significance (Sig.) (0.069), which is greater than (5%), while the value of Chi-Square is (7.095238) at the degree of freedom amounted to (3). Thus confirming the rejection of assumption 1 and acceptance of the alternative hypothesis. Which states that the average tax evasion varies by industry (banks, insurance, industry, investment).

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