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Estimating Factors Affecting Tax Evasion in Malaysia: A Neural Network Method Analysis

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ABSTRACT

Tax is one of the ways to finance government expenditures and it plays an important role in increasing the government revenue. The amount of tax collected depends on the structure of the economy. When the taxation system is ineffective, many people will use this opportunity to avoid paying tax and tax evasion will be popular. In the presence of tax evasion, the government cannot allocate revenue for their programs and cannot provide desirable social services. Realizing the significant impact of tax evasion on the economy, this study tries to determine factors that cause tax evasion and their relative contribution. The study employs an Artificial Neural Network methodology on Malaysian data from 1963-2010. The results show that the tax burdens, the size of governments and inflation rate have positive effect on tax evasion, but there is negative relationship between tax payers' income and trade openness with tax evasion.

Keywords: Tax evasion, Artificial Neural Network method.

INTRODUCTION

Tax is one of the ways to finance government expenditures and it has been an important component of government revenues. The share of tax in total revenues and the amount of tax collected differs among countries and they depend on the structure of the economy in each country. In Malaysia, the share of tax revenue in government total revenue is relatively high. For example, the total government revenue in 1963 was RM 1150 million in which about 80% or RM 915 million was financed by tax revenue. In 2010, the total government revenue increased to RM 162,131 million where the share of tax revenue was RM 107,092 million which in percentage decreased to 66% of the total revenue.

If taxation system cannot perform appropriate policies to collect tax, many people will use this opportunity to avoid paying tax; thus, tax evasion will be popular. Tax evasion happens because of many reasons. For example, people just try to avoid declaring their wealth, they simply do not want to pay tax or they prefer to save their money for own use. In the presence of tax evasion, the government cannot allocate revenue for programs and cannot provide desirable social services. Understanding why tax evasion happens and knowing factors that cause tax evasion is very important for decreasing tax evasion.

Despite the fact that there are many studies related to tax evasion for developed country, there is however a lack of study on tax evasion for developing countries especially for Malaysia. Some related studies, in particular Kasipillai et al. (2000), Kasipillai et al. (2003), Jaffar Harun et al. (2011) and Fatt and Ling (2008) have investigated the relationship between education, tax audit and tax evasion; and also discussed about ethics on tax evasion in Malaysia. None of them have looked specifically at the factors affecting tax evasion.

Realizing the significant effect of tax evasion on an economy and a lack of study in this area for Malaysia, this study attempts to fill the gap. Specifically, this study attempts to estimate factors that cause tax evasion and their relative contribution in Malaysia. For that purpose, an Artificial Neural Network method is employed on Malaysian data of 1963-2010. The results would be useful to policy maker especially in the government in deterring such negative activity.

This paper is organized as follows. The next section discusses the literature review which among others explains the factors that affect tax evasion. The following sections then explain the

methodology used and the collection of data. The discussion of results follows next while the last section concludes.

LITERATURE REVIEW

In literature there are many factors that can have direct effects or cause tax evasion. This section begins with the definitions of tax evasion as well as tax avoidance which usually discussed for comparison. Next, it discusses some main factors that are common in all studies, which lead to tax evasion.

Definitions of tax evasion and tax avoidance

Tax evasion is different from tax avoidance. Richardson (2008) defined tax evasion as "intentional illegal behavior or activities involving a direct violation of tax law to evade the payment of tax". Kim (2008) believes that tax evasion is illegal, whereas tax avoidance is a legal way of decreasing tax burden. In another study, Sandmo (2004) mentioned that tax avoidance is due to the gaps in the law and taxpayers without any worry about being disclosed try to find a solution to decrease the amount of tax to be paid. In this study, we consider tax evasion as "intentional illegal behavior or activities to evade the payment of tax" which is similar to the study of Richardson (2008).

Past studies

Previous studies on tax evasion usually focused on the factors that cause tax evasion and measuring tax evasion. This section looks at several factors which have played important role in causing tax evasion. One of the main causes of tax evasion is tax burden. Many researchers such as Brooks (2001), Savasan (2003), Dell'Anno (2007), Dell'Annoet al. (2004), Schneider and Savasan (2007) showed that an increase in tax burden leads to high shadow economy and tax evasion. Bayer and Sutter (2008) investigated the relationship between excess burden and tax evasion and showed that the excess burden of tax leads to a strong increase in the social investments, therefore tax evasion will increase. In other study which examined the impact of tax rates on tax evasion in the European economy, Bayer (2006) showed that higher tax rates led to more evasion. Cebula and Saadatmand (2005) showed that higher tax rates on income leads to increase tax evasion for the U.S. during 1967-1997.

Other important factors that cause tax evasion are inflation rate, income, unemployment, the size of the government and intensity of regulations and trade openness. Many researchers (Crane and Norzad 1986;Fishlow and Friedman 1994, Caballe and Panade 2004) investigated the relationship between inflation rate and tax evasion for U.S. economy and concluded that inflation rate has a positive effect on tax evasion. Similar results are also found in Iran's study. For example, Sameti et al. (2009) investigated the relationships between underground economy and inflation rate for Iran's economy during 1965- 2005. Using the MIMIC model, they concluded that the relationship between inflation rate and underground economy is positive. As for income, Embaye (2007) investigated the relationship between income and tax evasion in South Africa and showed that the relationship between income (GDP Per capita) and tax evasion is positive but statistically insignificant.

The other factor that causes shadow economy and underground economy (which also include tax evasion) is unemployment. Using the MIMIC method (Multiple Indicator and Multiple Cause) based on the latent variable structural theory, Dell'Anno et al. (2004) showed that unemployment and self-employment are important factors that cause shadow economy and underground economy in France, Spain and Greece. Other studies like Dell'Anno (2007) and Sameti et al. (2009) also found the same relationship in Portugal and Iran respectively.

Tax evasion is also caused by the size of the government and intensity of regulations. As the size of the government increases, so as its regulation, the government might have difficulty in controlling each of its sectors. As a result, tax evasion tends to increase. Aigneret al. (1988), Schneider and Savasan (2007) and Sameti et al. (2009) investigated the relationship between the size of government, its regulation and shadow economy. They uncovered that high intensity of regulation leads to the activities in informal economy and as a result tax evasion increases. Sameti et.al (2009) also found that the trade openness can also affect tax evasion. As the size of trade increases and trade regulations become more complicated, traders tend to avoid doing trade legally. Thus implementing difficult law and more restrictions for trade by governments can also lead to the rise of smuggled goods and hence tax evasion will increase.

Kasipillai et al. (2003) showed that other factor that causes tax evasion is tax culture. They evaluated the influence of education on tax compliance among undergraduate students in Malaysia, and

found that there is a close relationship between education and tax compliance. Studies in India by Jain (1987) also found that complicated tax structure, dishonest staff, high tax rates and high tax rate on sales are factors that cause high black money in India.

Among large number of studies related to tax evasion, only limited number of these studies investigated the phenomena of tax evasion for Malaysia. Among these studies, we can point to the study of Kasipillai et al. (2003) that investigated the influence of education on tax avoidance and tax evasion by using questioner method. In another study, Kasipillai et al. (2000) estimated the size of hidden income and tax evasion for Malaysia. Fatt and Ling (2008) investigated the relationship between tax practitioners perception, tax audit and tax evasion, and also Jaffar Harun et al. (2011) discussed about ethics on tax evasion. To our knowledge, there has been no study that has investigated the main factors that affect tax evasion and the importance of each factor on tax evasion for Malaysia. This paper attempts to fill this gap.

METHODOLOGY

There are various methods to estimate relationship between economic variables. Among them are OLS, 2SLS, 3SLS, VAR, ARMA, ARIMA, GARCH, and ARCH. Many researchers such as Tanzi (1980, 1983), Embaye (2007), Cebula and Saadatmand (2005) and Richardson (2006) have used these methods to estimate the relationship between underground economy, tax evasion and economic variables. In this study, we have applied a new method, namely Artificial Neural Network method (ANN) for estimating the factors that affect tax evasion and determined the importance of each variable.

Many researchers have recently used Artificial Neural Network method to estimate the relationship between economic variables and to forecast variables of macroeconomics. Unparalleled success of the Artificial Neural Network as a powerful method for analyzing data in empirical science has led to more attention among economists to use this method. Hill et al. (1994) compared the result of econometrics method and the Artificial Neural Network method. Their results suggested that the Artificial Neural Network method for estimating time series data was precise and perfect and in some cases was more precise compared other econometrics method. In other study, Kohzadi et al. (1995) compared the Neural Network method and the ARIMA model to forecast corn trades and concluded that the error of forecast by using the Neural Network method is 18-40% lower than the ARIMA model. Similarly, Fu (1998) in his study concluded that the Neural Network method is more precise than the regression model. Fu mentioned that the error for out of sample in the Neural Network method is 10-20 % lower than the regression model.

There are numerous studies that have applied the Neural Network method for modeling and forecasting in financial market, or forecasting macroeconomic variables such as GDP, inflation and stock prices, but there has been no study that uses the Neural Network method to estimate factors that affect tax evasion. Therefore, in this study we have applied the Neural Network method to estimate factors that affect tax evasion and the importance of each variable on tax evasion.

Neural Artificial Network Method

Researchers and employers in the industrial sector have paid attention to the neural network during the recent two decades and the outcome resulting from the modeling depicts non-linear trend. The Artificial Neural Network for nonparametric regression has recently been used in the business communities. Artificial Neural Networks may be viewed as a nonparametric technique; hence, these models would fit quite naturally for nonparametric estimation. There are three kinds of Artificial Neural Networks such as the multilayer perceptron, radial basis functions, and projection pursuit regression. In the recent literature, the most popular type of Artificial Neural Network applied to forecast time series data is the multilayer perceptron. In this section, we present the summary of multilayer perceptron Neural Network.

Multilayer Perceptron

Campbell et al. (1997) explained about the simplest example of an Artificial Neural Network is the binary threshold model of McCulloch and Pitts (1943), where Y is the output variable and X_j , j = 1... J is the input variables.

$$Y = g(\sum_{j=1}^{J} \beta_j X_j - \eta) \tag{1}$$

$$g(u) = \begin{cases} 1 & if\, u \geq 0 \\ 0 & if\, u < 0 \end{cases}$$

In equation (1), g (u) is the activation function and β is the synaptic weight of each input. Each input X_j has a weighting that is called the connection strength, and then summed across all inputs. If this weighted sum exceeds the threshold μ, then the artificial neuron is switched on or activated via the activation function g (u); otherwise it remains dormant. This simple network is often represented graphically in figure (1), in which the input layer is connected to the output layer.Each model of the Neural Network includes the input layer, output layer and hidden layer(s). All layers have nodes and the nodes are connected to the adjacent layers. The input layer receives the data and functions as an independent variable and the output layer functions as a dependant variable. The neural network is a calculative model that can connect the relationship between the input and output layers by nodes. The relationship between the input and output is determined by the weighting (β); therefore, the net value of the output neurons is as follow:

$$NET_t = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 = \beta_0 + \sum_{j=1}^{5} \beta_j X_j \tag{2}$$

The main role of the neurons in a neural network is data processing; data processing for output neurons is done by using the activation function. There are many linear and non-linear activation functions in the Neural Network method. Each activation function is applied for a specific case. Logistic cumulative distribution function and hyperbolic tangent are the non-linear functions popular in time series predictions and are defined respectively as follow:

$$g(u) = \frac{1}{1+e^{-u}}$$

$$g(u) = \frac{(e^{u} - e^{-u})}{(e^{u} + e^{-u})} \tag{3}$$

The value of the logistic cumulative distribution function is between 0 and 1, and the value of hyperbolic tangent is between -1 and 1.[1]The most important extension of the binary threshold model is the introduction of a hidden layer between the input layer and the output layer.

$$Y = h(\sum_{k=1}^{K} \alpha_k g(\beta_k' X) \tag{4}$$

$$\beta_k = [\beta_{k1}, \beta_{k2}, ..., \beta_{kJ})]'$$
$$X = [X_1, X_2, ...X_J]'$$

where h (u) is another nonlinear activation function. In this case, the inputs are connected to multiple hidden units, and at each hidden unit they are weighted and transformed by the activation function g. The output of each hidden unit is then weighted yet again and then summed and transformed by a second activation function h(u). This network configuration is an example of a multilayer perceptron (MLP) with a single hidden layer in this case and perhaps the most common type of artificial neural network among recent application. The multilayer perceptron has a more complex network topology by adding even more hidden layers. (See figure 2).

1-For more details refer to Campbell etal. (1997) ,Gademe and Moshiri, (2003)

For a given set of inputs and outputs $\{X_t, Y_t\}$, MLP approximation amounts to estimating the parameters of the MLP network by minimizing the sum of the squared deviations between the output and the network:

$$\sum_t [Y_t - \sum_k \alpha_k g(\beta_k' X)]^2$$

To minimize the predicted errors of the test, Hoiden et al. (1990) mentioned 4 popular criteria to minimize the predicted errors. The most popular criteria are as follow:

1- Mean Squared Error or Root Mean Squared Error.

$$MSE = \frac{\sum (\hat{y}_t - y_t)^2}{n}$$

$$RMSE = \sqrt{\frac{\sum (\hat{y}_t - y_t)^2}{n}}$$

2- Mean Absolute Deviation or Mean Absolute Percentage Error.

$$MAD = \frac{\sum |\hat{y}_t - y_t|}{n}$$

$$MAPE = \frac{\sum \left| \frac{\hat{y}_t - y_t}{y_t} \right|}{n}$$

In the terminology of this literature, the process of parameter estimation is training the network. The single hidden-layer, MLP (equation 4) of any nonlinear function to an arbitrary degree of accuracy with a suitable number of hidden units can be approximated properly .The most important advantage of MLPs is their ability to approximate complex nonlinear relations through the composition of a network of relatively simple functions. This specification lends itself naturally to parallel processing.

DATA COLLECTION

All data are collected from the world development indicators (WDI) and yearly book of Economic Report. There are many factors that lead to tax evasion as discussed previously. However, the study only concentrates on the main causes of tax evasion as some other factors are not observable and difficult to obtain. The main causes of tax evasion selected in this study are presented below:

1-Tax burden

Tax burden is measured by using different proxies such as direct, indirect taxes as a percentage of gross domestic products. Similar other studies (Schneider (1994), Brooks (2001), Dell'Anno et al. (2004), Savasan (2003), Dell'Anno (2007), Schneider and Savasan (2007)) we use the ratio of total tax revenue as a percentage of gross domestic products as a proxy to calculate tax burden.

2- Income of tax payer

Based on the theoretical and empirical study, an increase in income may leads to increases or decreases in tax evasion. In empirical studies Embaye (2007**)** showed that there is a close and positive relationship between income (GDP Per capita) and tax evasion in South Africa. Income (GDP per capita) is calculated as GDP at constant U.S. dollars divided by the population.

3. The size of government

The size of the government and intensity of regulations are other importance factors that have significant effect on tax evasion. Aigneret al. (1988), Schneider and Savasan (2007) showed that an increase in the intensity of regulations leads to work in informal economy. In this study, we use real government consumption in percentage of GDP as a proxy of the size of the government the same as the study of Aigneret al. (1988), Dell'Anno et al. (2004) and Sameti et al. (2009).

4. Inflation rate

Many researchers (Crane and Nourzad 1986; Fishlow and Friedman 1994; Caballe and Panade 2004) showed that inflation rate is the main factor that causes tax evasion. High inflation causes taxpayers to avoid paying tax to hold the power of their purchase.

5. Trade Openness

Policy makers may use various policies such as the prohibition of import or export or short- time or long -time in developing countries. Curbing or cutting business relationship with a particular country or countries and rationing the amount of import or export of goods and most of the administrative policies led to the underground economy (Ashraf - Zadeh and Mehregan 2000). Sameti et.al (2009) in the case study of Iran showed that there is a negative relationship between trade openness and tax evasion.
In this study we use the ratio of the summation export and import to GDP as the proxy of trade openness. (Similar study has also been done bySameti et.al (2009)).

Based on theoretical and empirical studies there are many factors that cause tax evasion. In this study several factors that have main effect on tax evasion are selected. Tax evasion can be written as a function as follow:

$$TE = f(TB, G, Y, \pi, OP)$$

TE is tax evasion. Because we don't have any data for tax evasion, we use C/M2 as a proxy of tax evasion. Similar approach has been done by Tanzi (1982) and Embaye (2007)). C/M2 is the ratio of currency to liquidity.TB is tax burden and is calculated as the ratio of tax revenue to GDP, G is the size of government and measured as the ratio of government consumption to GDP, Y is income (GDP per capita), the income of taxpayer calculated as GDP (constant U.S. dollars) divided by population, π is inflation rate (percentage change in consumer price index) and OP is trade openness and calculated as the ratio of sum of export and import to GDP. The description of the factors that cause tax evasion is shown in table (1).

To use Neural Network method, at first we should find the synaptic weight of network. Afterwards, by using algorithms iterations (the error back propagation is the most well-known one) the network weights will balance. It means that the network is trained to minimize the predicted errors that are measured within the model.

The coefficient estimation of a neural network for non-linear system is not as easy as linear parameter estimation. There may be several answers of relative optimum for minimizing the difference between the real value of output variable and the achieved results from the network.

RESULTS

In this study, to investigate the factors that affect tax evasion and determine the relative importance of each variable on tax evasion, we have applied an Artificial Neural Network methodology for Malaysian data from 1963-2010. The independent variables are used as the input data for the input layer in this method. Based on the different structures in the Neural Network model, the number of different layers, the different numbers of nodes in each layer and the running network for many times, the model with minimum error was chosen as the fit model in the Neural Network model. The input variables in this model are: tax burden; the size of government; income (GDP per capita); inflation rate; trade openness while the output variable is tax evasion.

In the Neural Network model, some percentages of data should be allocated for training and a few percentages of data should be allocated for testing. In this study, we allocated 70% of data for training and 30% for testing. For training the Neural Network, we can use the multilayer perceptron (MPL) or redial basis function. In this study, we have used multilayer perceptron (MPL) with 5 factors

for the input layer. MPL consists of 1 hidden layer with non-linear activation function. Activation function in the hidden layer is the hyperbolic tangent, while the number of units in the hidden layer is 19 and the activation function in the output layer is softmax. The percentage of incorrect predictions in our model (after choosing the fit model) is 0% and this shows that the Network is fit and precise for modeling and estimating the factors that affect tax evasion. After the modeling, creating and trainingof the neural network, we need to find the synaptic weight. To find the true synaptic weight, training and running of the program should be repeated continuously. Finally, the model with minimum error was chosen as a fit model in the Neural Network model. After running, the network determined many weights. In our model, the weights were determined in 19 layers for each variable. For example, we had chosen 70% of the data for training, and after training and finding the best model with minimum error, the synaptic weight was determined. The number of units in the hidden layer is 19, and this means that we have 19 columns of synaptic weights for 70% of the data. In total, for each variable we have weighted about 19 columns and 33 rows. We then calculated the mean of each unit layer for the 33 rows and then calculated the mean of all layers for each variable. The calculated coefficient and estimated model is given as follow:

$$TE = 0.18 + 1.4 * TB + 1.58 * G - 2.23 * Y + 1.62 * \pi - 0.56 * OP \qquad (5)$$

The Neural Network Model is able to determine the importance of each variable in the fit model. Table (2) and Figure (3) show the importance of input variables on tax evasion in modeling the Neural Network model.

According to Table (2), Figure (3) and Equation (5), we can conclude that the income of the taxpayer is the main factor affecting tax evasion; the normalized importance of this variable is 100% and it has the highest value of importance among other factors. The coefficient of income (gdp per capita) is -2.23 in Equation (5) and this shows that there is a negative relation between income of tax payer and tax evasion. This signifies that an increase in income leads to a decrease in tax evasion. In theoretical and empirical studies, the relationship between the income of the taxpayer and tax evasion is not clear and depends on the structure of the economy of each country. Embaye (2007) in the case study of Africa showed that the relationship between income and tax evasion is positive. We can justify that, after increasing income, if the governments increase the rate of tax on income with high percentage, taxpayers will avoid paying tax and tax evasion will increase, but if the rate of tax on income is kept constant, increasing with low percentage or decreasing, taxpayers will pay tax and tax evasion will decrease. In Malaysia, as the tax rate on income (corporate and others) has decreased since about 10 years ago until now, the relationship between the income of taxpayers and tax evasion is negative and thus, increasing income leads to low tax evasion.

The second factor that has an important high effect on tax evasion is trade openness. The normalized importance of this variable is 97.7% and according to Table (2), after the income of taxpayer, the high value of importance among the independent variables is allocated to trade openness. The coefficient of this variable is - 0.56, and there is a negative relationship between trade openness and tax evasion, similar to the study which was done by Sameti et al. (2009) for Iran's economy. As we know, trade openness causes a rise in tax revenue and decreases tax evasion. When trade is open in the economy, export and import are legal and all trades are lawful. When the governments perform difficult restrictions for trade, the export and import of goods occur illegally and are often smuggled. Since there is no tax on illegal trade, tax revenue will decrease and leads to an increase in tax evasion.

Another factor that causes tax evasion is inflation rate. According to Equation (5), the relationship between inflation and tax evasion is positive; this means an increase in the inflation rate leads to high tax evasion. Crane and Nourzad (1986) and Caballe and Panade (2004) also found positive relationship between inflation and tax evasion. We know that high inflation can influence the decision of the taxpayers. When inflation is high, taxpayers prefer to save their money to hold the power of their purchase and avoid paying tax, therefore tax evasion will increase.

Based on equation (5), the relationship between the size of government and tax evasion is positive. Aignet et al. (1988), and Schneider and Savasan (2007) also found the same result. We know that when the size of the government increases, the control of each sector in the economy is difficult and tax evasion will therefore increase. In the other hand, when the size of the government increases, the intensity of regulations will increase. An increase in the intensity of regulations leads to work in informal economy; therefore tax evasion will increase.

Tax burden is another factor that causes tax evasion. Results show that there is a positive relationship between tax burden and tax evasion, but this variable has low importance among all the other variables. Brooks (2001), Savasan (2003), Dell'Anno (2007), Dell'Annoet al. (2004), and

Schneider and Savasan (2007) found that there is a positive relationship between tax burden and tax evasion.

CONCLUSION AND SUGESTIONS

The main purpose of this study was to determine the factors affecting tax evasion and their relative contribution by using data from 1963-2010 for Malaysia. To achieve this aim, we have applied the Neural Network method and used multilayer perceptron layer (MPL) with 5 factors for the input layer. MPL consists of 1 hidden layer with non-linear activation function in the hidden layer. Activation function in the hidden layer was the hyperbolic tangent; the number of units in the hidden layer was 19 and the softmax activation function was utilized in the output layer. After modeling, creating and training and running the neural network, we chose the best model with minimum error and came to the conclusion below.

The income of the taxpayer is the main factor that affects tax evasion; the normalized importance value of this variable was the highest among all the other factors. The coefficient of this variable showed that there is a negative relationship between income of tax payer and tax evasion. Embaye (2007) in the case study of Africa showed that the relationship between the income of the taxpayer and tax evasion is positive. A main reason for the positive or negative relationship between the income of the taxpayers and tax evasion is hidden in the rate of tax on income. After increasing income, if governments increase the rate of tax on income, the reaction of taxpayers is avoiding tax and tax evasion will increase, but decreasing the rate of tax on income leads to taxpayers paying tax and tax evasion will therefore decrease. In Malaysia, due to the fact that tax rate on income (corporate and other) has decreased since about 10 years ago until now, the relationship between the income of the taxpayers and tax evasion is negative and this increase in income has led to low tax evasion.

The second factor that has high importance effect on tax evasion is trade openness. The normalized importance and the high value of importance among the independent variables after income of taxpayer are assigned to trade openness. The negative coefficient of this variable showed that there is a negative relationship between trade openness and tax evasion. Trade openness causes a rise in tax revenue and decreases tax evasion. Implementing difficult law and restriction for trade by governments leads to the rise of smuggled goods and hence tax evasion will increase.

Another factor that causes tax evasion is inflation rate. The positive relationship between inflation and tax evasion showed that an increase in inflation leads to high tax evasion. As we know, inflation can influence the decision of taxpayers. When the inflation rate is high, taxpayers prefer to save their money to hold the power of their purchase and avoid paying tax, therefore tax evasion will increase.

Based on the estimated equation, the relationship between the size of government and tax evasion was positive. When the size of the government increases, the control of each sector in the economy is difficult for the government and tax evasion will be popular.

Tax burden is another factor that causes tax evasion. There is a positive relationship between tax burden and tax evasion, but because the burden of tax is not high in Malaysia, people pay tax and the value of importance of this variable is therefore the lowest among all the variables.

Based on the results of this study, in order to decrease tax evasion, policy makers should note that high rate of tax on income leads to high tax evasion. Therefore, they should try to reduce the rate of tax on income, assets, and capital, corporate and others. Decreasing the restriction of law for trade, controlling inflation and decreasing the size of government are other suggestions that could lead to decreases in the size of tax evasion.

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FIGURES AND TABLES

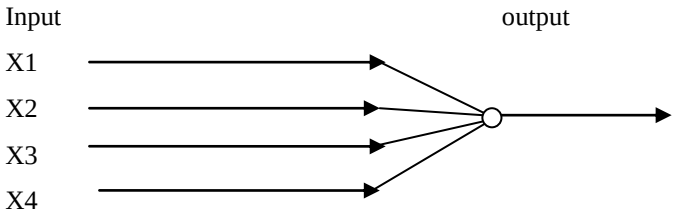

FIGURE 1: Binary Threshold Model

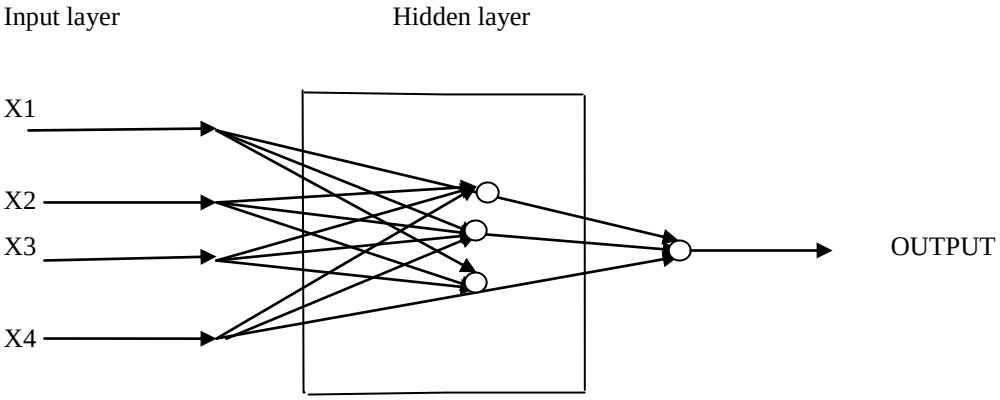

FIGURE 2: Multilayer Perceptron (MLP) with a Single Hidden Layer

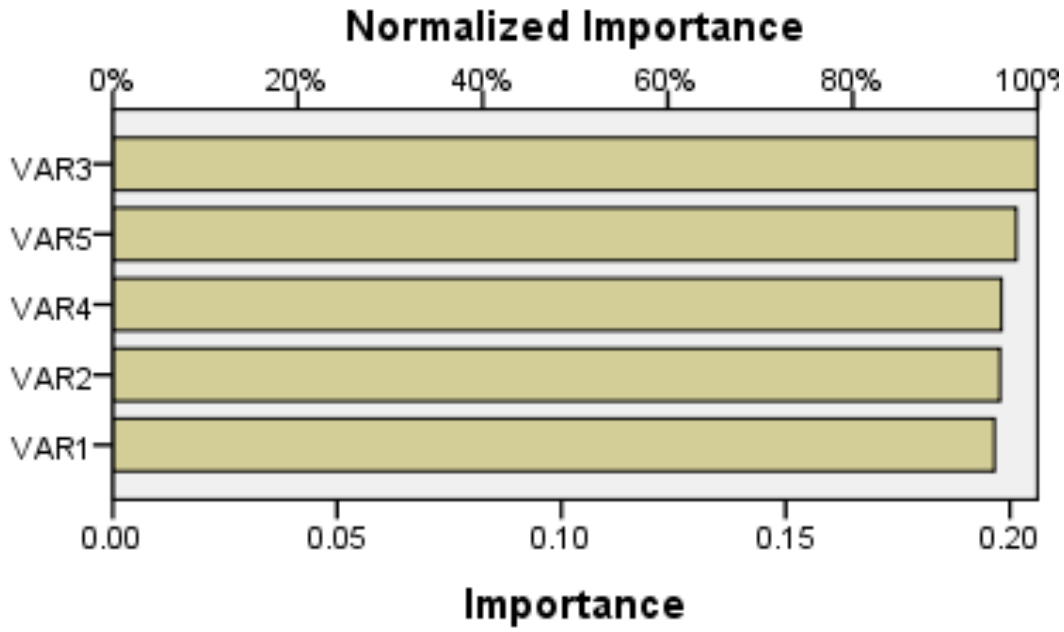

FIGURE 3: The Normalized Importance of Independent Variable

Note: (VAR1=tax burden, VAR2=the size of government, VAR3=income (gdp per capita), VAR4=inflation rate, VAR5=trade openness)

TABLE 1: The Factors that Causes Tax Evasion

Variables	**Descriptions**
TB	Tax burden calculate as ratio of tax revenue to GDP
G	The Ratio of government consumption to GDP
Y	A measure of the income of taxpayer calculated as GDP constant U.S. dollars divided by population.
	Change in consumer price index
OP	Ratio of sum of export and import to GDP

Data Source: All Data Collected from World Development Indicators (WDI) and Yearly Book of Economic Report (1963-1980)

TABLE 2: The Importance of Independent Variable

Independent Variable Importance

	Importance	Normalized Importance
TB	.197	95.3%
G	.198	95.9%
Y	.206	100.0%
π	.198	96.1%
OP	.201	97.7%

Source: Calculated by Author

Note: (TB= Tax Burden, G =The Size of Government, Y=Income (GDP per capita), π =Inflation Rate, OP =Trade openness).