Research article

Public policies and tax evasion: evidence from SAARC countries

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ABSTRACT

In compliance with the socioeconomic theory, the study has strived to investigate the impact of economic and non-economic public policies on tax evasion using panel data of 7 SAARC countries covering the period from 1998 to 2015. The study has applied the ordinary least square with fixed effect and random effect models to analyze the data assembled. The result of the study implies that the higher the degree of economic freedoms, the lower the tax evasion. More specifically, the government policies about property rights, monetary freedom, fiscal freedom and investment freedom have a negative influence on taxpayers' choices of tax evasion while financial freedom result shows a positive effect on tax evasion. Additionally, there is a negative impact of public sector governance and religiosity on tax evasion, which implies the higher the public sector governance and the higher the religious faith amid the people, the lower the degree of tax evasion. The findings of the study are supposed to offer the governments, tax authorities, and research scholars the valuable insights into public policies for reducing the tax evasion to a significant extent.

1. Introduction

Tax evasion is a global phenomenon faced by almost all countries of the world. Tax revenue is the most vital source of funding of a country for its economic development, but tax evasion makes it quite challenging for the tax authority for full and efficient collection of tax revenue from taxpayers (Rashid, 2020; Siddiquee and Saleheen, 2020). Tax evasion is viewed as the severe loss of government revenues that restrain the government from providing smooth public services due to the decline of the state budget of public revenues (Androniceanu et al., 2019). Rashid (2020) described tax evasion as an illegal act that breaches the law and deviates from social norms to reduce one's tax liability. Mason et al. (2020) claimed that firms are less intended to comply with tax laws if they perceive an unfavorable impact on their government or an unfair policymaking process. Androniceanu et al. (2019) found an interdependence between tax evasion and public policies and identified the degree of economic, social, and cultural development as the main determinants of tax evasion. So, it has become a debatable issue over the decades among policymakers to find a better solution to tackle the growing problem of tax evasion.

South Asia is sitting at the top of the economic growth, having an average growth rate of 7–8 percent in the last 30 years, which is three times or more than that of the EU economies and about twice the global average. But the economy is characterized by a high level of corruption, a low level of good governance, a high inflation rate, and an enormous tax burden on the citizens. The large informal sector, weak economic base, and incompetent tax collection and administration contribute to having a historically lower percentage of tax to GDP in Emerging Market Economies (World Bank, 2019). Nevertheless, the SAARC countries have struggled to increase their tax-to-GDP ratios over the last decade despite ongoing tax reform. The low level of tax restricts the government's capability to finance infrastructural and social development (Gupta, 2015). Moreover, research shows that the cause of lower tax to GDP ratio is not only for the ineffective mobilization of tax revenue but also the need for a different tax base (Gupta, 2015). So, the study has selected the SAARC countries to identify an appropriate public policy to increase their tax to GDP ratio in the future.

Many scholars have examined the impact of business freedom, property right, culture, GDP, inflation, good governance, ethics, and so forth on tax evasion (Nurunnabi, 2018; Zaman et al., 2019). Their studies are limited either with the economic factors or with the non-economic

factors leading to tax evasion. But the typical neoclassical model to tax evasion (Allingham and Sandmo, 1972) cannot explain the socio-behavioral dynamics (Gangl et al., 2015) without the presence of the economic actors. Again, the policymakers in South Asian countries are struggling to increase the tax to GDP ratio to keep sustaining their growth potential in the future. Therefore, the study raises the following research question. Do economic and non-economic public policies affect tax evasion in SAARC countries, and if so, to what extent? For answering the research question, the study investigates not only the influence of economic factors but also non-economic public policies on tax evasion in the business model to extend the area of investigation. These public policies can be classified into three groups, specifically, economic freedom, good governance, and religiosity as per the socioeconomic theories. In several ways, this study would have contributed to the tax literature. Firstly, the study extends the socioeconomic theory adding economic freedoms, for instance, government spending, monetary freedom, fiscal freedom, investment freedom, financial freedom, and the two major religions in this region - Islam and Hinduism. secondly, the outcome of this research will guide the government and policymakers to recognize the interrelationship between public policies and tax evasion and allow them to take necessary steps towards the development of policy frameworks for reducing tax evasion. Finally, the study provides an essential summary of multiple data sources for future international tax researchers and practitioners on the related issue.

2. Theory, literature review and hypotheses development

There are different theories of tax evasion pronouncing the country's attitude towards non-taxpayers. The economic deterrence theory (Allingham and Sandmo, 1972) states that tax evasion is a crime, and it is committed by an individual when he considers the predicted benefits from the crime are much higher than the costs of being caught. Legal commitment based on the rule of law provides a suitable ground for the government to prevent and punish tax evaders (Allingham and Sandmo, 1972; Schneider and Enste, 2000). The theory is endorsed by the finding that there is a negative association between legal enforcement and tax evasion (Becker, 2013). Feld and Frey (2007) developed the concept of a psychological tax contract to establish a fair and reciprocal obligation between government and taxpayers, where one party gives something, and the other takes something - a quid pro quo situation. Based on this theory, taxpayers feel discouraged to pay tax if they perceive the quality of state institutions as low in general. Like the deterrence theory, this theory also considers taxpayers as rational persons having extensive knowledge of the costs and benefits of tax evasion. Smith and Smith (2014) presented another theory called the theorem of moral sentiments that implies religiosity acts as a type of internal moral force in paying taxes. A study found that religious people have more moral sense (Marquette, 2012) and religiosity keep people away from all evil-activities and deter tax evasion.

Although the Allingham and Sandmo (1972)'s model of tax evasion is crucial in explaining tax evasion's potential reasons, it is limited only with the (institutional norm) legal enforcement by the tax authority and it ignores the potential influence of taxpayers' personal belief and country's economic freedom on tax-paying behaviour. Again, the sentimental theory of tax evasion considers only one aspect (individual norm) of tax evasion while other aspects (economic freedom and institutional norm) are absent. On the other hand, the psychological contract theory of tax evasion considers all the individuals as rational, but the concept of rationality is ambiguous as it depends on multiple factors. Considering the limitations of the existing theories of tax evasion, Nurunnabi (2018) proposed a theory called the socioeconomic theory describing tax evasion based on 'institutional infrastructure' (Pickhardt and Prinz, 2014) shown in Figure 1. He considered tax evasion as a complex process of multiple factors, including institutions, entities, individuals, and individual's tax-paying behaviour. The theory classifies economic and non-economic factors of tax evasion into three broad categories: taxpayers' behaviour, state structure, and the behaviour of the tax authority. The hypotheses of the study have been developed based on this theory.

2.1. Economic freedoms

Economic freedom is a composite index of government integrity, legal system and property rights, sound money, free trade, and regulation (Bayar and Öztürk, 2019). Miller et al. (2020) classified economic freedom into four boards categorized viz. the rule of law, regulatory efficiency, open markets, and government size. It provides every human with a fundamental right to manage his/her labor and property. Individuals, in economically free societies, are free to work, create, consume, and spend in whatever way they want (Kim and Holmes, 2016). Goel and Saunoris (2017) found that economic freedom reduces the shadow economy in his analysis of 100 countries during 1990–2006. Conducting a study of 42 countries across the four sub-Saharan Africa, Alabede (2018) documented that the country with high economic freedom tends to have higher tax revenue.

2.1.1. Property rights (the rule of law)

Property rights allow individuals to acquire private property freely. More secured property rights fail to make equal distribution of resources and reduce the potential ability of households to cope with exogenous shocks, though it helps increase their openness to the economic mechanism (Deininger and Jin, 2003). Effective enforcement of the rules of law (secured property rights) is a source of strong support for the government that acts against tax evasion. Prior studies evidenced that weaker enforcement of the rule of law leads to a quick change in tax structure and more tax evasion (Allingham and Sandmo, 1972; Schneider and Enste, 2000; Richardson 2008). Similarly, the enforcement initiatives taken by the government and tax authorities reduce tax evasion significantly (Rashid, 2020). In line with prior studies, we propose the following hypothesis:

H1a: The higher the property rights in a country, the less the possibility of tax evasion.

2.1.2. Fiscal freedom and monetary freedom (Regulatory efficiency)

Fiscal freedom signifies tax rates on corporate and individual earnings. The tax rate determined by the fiscal policy is a percentage of the accounting profit of the firms and individuals determined based on the tax rules of a particular country (Adhikari et al., 2006). The government fiscal policy also plays a vital role in determining taxpayers' perceived behavior (Wu et al., 2007). Fisman and Wei (2004) found that tax evasion is increased by more than 3% for each 1% increase in the tax rate. Other studies also found a positive correlation between the marginal tax rate and tax evasion (Nurunnabi, 2018; Pappa et al., 2015). However, the prior studies found a mixed relationship between tax evasion and monetary freedom (inflation). Pappa et al. (2015) evidenced a long experience of both high inflation and low tax evasion. They argued that the level of tax compliance falls when inflation progresses. But Nurunnabi (2018) showed that with increased inflation, tax evasion decreased in Muslim countries. Based on the above discussion, we can formulate the following hypothesis.

H1b: The higher the tax rate (fiscal freedom) in a country, the higher will be the tax evasion.

H1c: The lower the monetary freedom in a country, the higher will be the tax evasion, all other things being equal.

2.1.3. Investment freedom and financial freedom (Open market)

Goel and Nelson (2005) found that economic openness matter more than political openness in an economy, and among all the economic elements, monetary policy seems to have a more substantial influence on
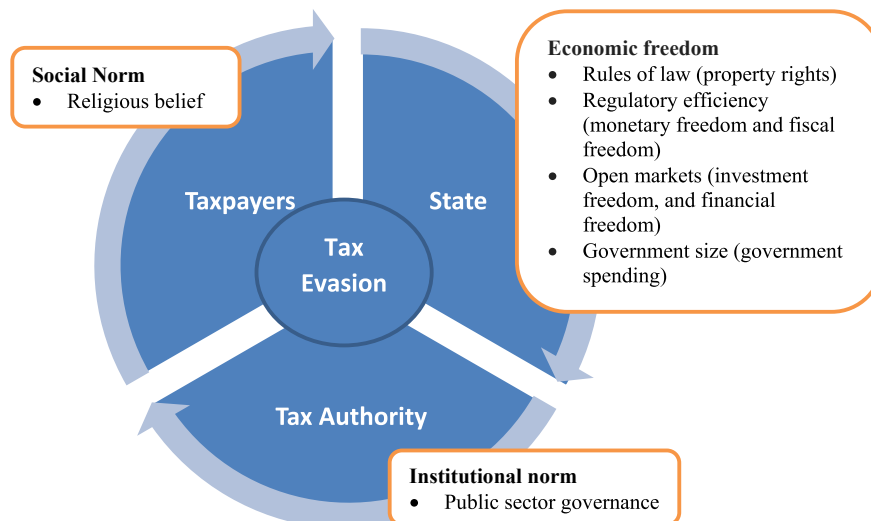
Figure 1. The socioeconomic theoretical model of tax evasion.

the level of corrupt exercises in a country. A lack of the open market/economic freedom might influence the decision-makers in using a strategic transit to choose between the costs and benefits of bribes (Shleifer and Vishny, 1993). Therefore, a high level of economic freedom ensures the high tax morale of the taxpayers. Moreover, the study of Alabede (2018) found a significant positive impact of investment freedom as well as the composite financial freedom on tax revenue performance. Protecting investors has a significant effect on their earnings management (Fung et al., 2013); it may lead them to the choice of tax evasion planning. Accordingly, more investment with added financial freedom and more entrepreneurial exercises help reduce tax evasion. Therefore, we can propose the following hypotheses.

H1d: The higher will be the investment freedom in a country; the lower will be the tax evasion.

H1e: The higher will be the financial freedom in a country; the lower will be the tax evasion.

2.1.4. Government spending (Government size)

Theoretically, government spending as a measure of government size (Li and Ma, 2015) may have either a positive or a negative impact on tax evasion (Sritharan and Salawati, 2019). In the one hand, an increase in government spending enhances administrative expenditure with increased pressure on the fiscal budget, which may force the government to raise tax rates and may lead taxpayers to evade tax (Li and Ma, 2015). On the other hand, the government size denotes the state capacity (Besley and Persson, 2009), and a government with strong state capacity can uphold the rules of law and may lead to a decrease in tax evasion and an increase in tax revenue. But in an empirical examination of the effect of government size on tax evasion in China, Li and Ma (2015) revealed that large government size is positively associated with more tax evasion as it fails to bring a strong state capacity to enforce tax rules at the local level.

H1f: The higher the government spending in a country, the higher/lower will be the tax evasion.

2.2. Public sector governance

Umar et al. (2019) adopted a conceptual approach to explain the association between governance quality and individual tax compliance in

the context of a developing country. They proposed that good governance encourages people to recognize that the government works for their interests, and its procedures are fair, which, in turn, will increase their trust in government (Feld and Frey, 2002). Torgler and Schneider (2009) stated that: If citizens perceive that their interests (choices) are well-represented by political institutions, their willingness to act in the hidden economy decreases. Eventually, the strong support of the policymakers on strict enforcement of governance codes engages citizens emotionally and inspires them to show obedience and compliance with tax laws. On the other hand, in an inefficient country where corruption is widespread, the citizens hold little trust in government and thus a low incentive to cooperate. Yamen et al. (2018) found a significant negative association between governance indicators and tax evasion in EU countries. This discussion leads to the following hypothesis:

H2: The higher the quality of a country's public sector governance (institutional quality), the lower will be the tax evasion, all other things being equal.

2.3. Religious faith

Religiosity is a devotion to religion and the piety of an individual. It does not allow tax evasion as it teaches righteousness and the right people pay their tax to the state. Based on Islam, 'Allah will penalize us if we do not pay to the state' (Jalili, 2012). In Islam, *Zakah* (tax/rates and paying tax/rates) is the third pillar of faith, which is a compulsory payment for the people to fulfill the criteria for it. Similarly, based on Hindu morals, taxes should be set and known to the taxpayers in terms of the amount and time to pay so that it becomes easier for the collectors to levy the appropriate tax for their benefits (Waldauer et al., 1996). Other religions also stress to pay a fixed amount to the state and show rational behavior in this regard. Conducting a study on the impact of Shari'ah regulation on tax evasion in the Muslim world, Nurunnabi (2018) found that religiosity reduces tax evasion significantly. Similarly, Bose (2012) found a significant association between the ethics of Hinduism and tax evasion. Therefore, this study assumes that religious devotion will provide a better result for ensuring tax morale and tax compliance following the actual role of religiosity (Pope and Mohdali, 2010).

H3: The higher the impact of religion (Islamism and Hinduism), the lower will be the level of tax evasion, all other things being equal.

3. Data, model and methodology

3.1. Data

3.1.1. Sample size and data sources

The study collects a panel data set from 126 observations comprised of 7 SAARC countries- Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka- for 18 years from 1998 to 2015 based on data availability[1]. The inclusion criteria of individual countries in the study were: (1) SAARC countries, and (2) data availability on tax evasion. The 8 SAARC countries were comprising 21% of the world's population, but Afghanistan was excluded due to unavailability of tax evasion data. A wide range of data sources, including the World Bank (1998–2015), The Heritage Foundation (2015), World Economic Forum (2015), and individual government's websites of selected countries, have been used in this research.

3.1.2. Dependent variable

We have used the size of the shadow economy as a proxy for tax evasion for the dependent variable (Yamen et al., 2018). This research is based on the MIMIC model[2] (Multiple Causes Multiple Indicators), a shadow economy of macroeconomic measure. International Monetary Fund (IMF) defines the shadow economy as:

The shadow economy is, by nature, difficult to measure, as agents engaged in shadow economy activities try to remain undetected. The extent of development of the shadow economy over time is driven by its political and economic relevance. Moreover, total economic activities with official and unofficial production of goods and services are required to design economic policies that respond to changes and economic development over time.

3.1.3. Independent variables

The study has used public policies as independent variables that include both economic and non-economic factors. The economic factors include all economic freedoms, while the non-economic factors recognize public sector governance and two major religions, Islam and Hinduism presented in Appendix A.

3.1.4. Control variables

A panel study needs to include a few variables as the control for the social and economic differences of countries. For controlling the social and economic differences, two control variables are included in the model viz. unemployment rate (UNEM) and agricultural contribution (AGR) as a percentage of GDP (Yamen et al., 2018). The higher the unemployment rate and the higher the agricultural contribution of a country, the higher the level of tax evasion. In an additional model, the log of GDP has been included to confirm the robustness of our baseline model.

3.2. Model specification

The main objective of this study is to analyze the relationship between public policies and tax evasion, whereas public policies include both economic and non-economic factors. The study uses the following model as the baseline–

$$TE_{it} = \alpha_0 + \beta_1 PR_{it} + \beta_2 PSG_{it} + \beta_3 MF_{it} + \beta_4 FF_{it} + \beta_5 IF_{it} + \beta_6 TR_{it} + \beta_7 GS_{it}$$
$$+ \beta_8 MUS_{it} + \beta_9 HIN_{it} + \beta_{10} AGR_{it} + \beta_{11} UNEM_{it} + Year\ dummy + \varepsilon_{it}$$

(1)

where, TE = tax evasion score; PR = property rights score as a proxy of legal enforcement; PSG = public sector governance score; MF = monetary freedom as a factor of doing business; FF = financial freedom; IF = investment freedom; TR = tax rate as proxy of fiscal freedom; GS = government spending; MUS = the percentage of Muslims; HIN = the percentage of Hindus; INF = inflation rate; AGR = the percentage of GDP; UNEM = the percentage of total labor forces; Year dummy = 1 for the respective year otherwise 0; ε_i = error term; i= number of countries; t = number of periods and α_0 = Intercept term; $\beta_1, \beta_2, \beta_3.....\beta_{11}$= slope coefficient of the variables.

Further, the study has run some additional models using alternative variables to check the robustness of the baseline model. For instance, instead of public sector governance, monetary freedom, and government spending, the study used government integrity, inflation rate as a proxy of monetary freedom, and tax revenue respectively. Moreover, taking the financial crisis during 2008 into account, we have used a crisis dummy to check whether it has a significant effect. Furthermore, we have run two separate models considering before and after the crisis period.

3.3. Econometric methodology

3.3.1. Cross-sectional dependence test

Following the study of Le (2020), the present study run Pesaran (2004) cross-sectional dependence test, a modified version of the LM test. Since a cross-country investigation can interact with each other within the economic-social network; it may lead them to a cross-sectional dependence which in turn makes bias the estimation outcomes (Le, 2020). We recorded the presence of cross-sectional independence in our study.

3.3.2. Panel unit root test

In the absence of cross-sectional dependence, further, we applied first-generation panel unit root tests using Im Shin Pesaran (IPS) and Levin-Lin Chu (LLC) (Im et al., 2003). We did not find the coefficient value of some variables (Property rights, financial freedom, tax rate, and religious faith) under the IPS unit root test due to a lack of required observations. Again, we found the insignificance of some non-economic variables including property rights, religiosity, and tax rate in both level and first difference under the LLC unit test. Therefore, we conclude that our model is static rather than dynamic over time.

3.3.3. Static models

Under the static model, three alternative linear estimation techniques are available to handle panel data (Asteriou and Hall, 2007): (a) pooled OLS method, (b) fixed-effect (FE) also known as the least square dummy variable model, and (c) random effect (RE) model.

The pooled OLS method is also known as a common constant method that estimates data under the chief assumption that there is no heterogeneity among the cross-sectional units; more specifically, this procedure considers all cross-sectional units as a single unit. Thus the pooled OLS technique assumes that there are no differences among the cross country or individuals or firms within the panel data. This process estimates a single constant "a" for all cross country.

On the other hand, the fixed-effect model introduces heterogeneity among cross-sections through the constant of the regression function. This approach provides a separate intercept for each cross-section and this is called a one-way fixed-effect as it can capture only time-invariant characteristics within the individual. It is very simple to transform a one-way fixed-effect model into the two-way fixed-effect model. Hence, we have to introduce only a time dummy as it captures all effects that will

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[1] The latest data on tax evasion covered up to 2015 which was published by International Monetary Fund in the title of "Shadow Economies Around the World: What Did We Learn Over the Last 20 Years?" on January 2018.

[2] This MIMIC model takes into account some factors such as tax burden, state regulation burden, quality of state institutions, social security burden, tax morale, unemployment rate and GDP per capita (Schneider et al., 2011), which directly affects the dimensions of the shadow economy over time.

vary over time but are common within the cross-section. The pooled OLS and fixed effect models can be specified in the following way:

Pooled OLS model:

$$Y_{it} = a + \beta_1 \, x_{1it} + \beta_2 \, x_{2it} + \beta_3 x_{3it} + \beta_4 x_{4it} + u_{it} \quad (2)$$

Fixed effect model:

$$Y_{it} = a_i + \beta_1 \, x_{it} + \beta_2 \, x_{2it} + \beta_3 x_{3it} + \beta_4 x_{4it} + u_{it} \quad (3)$$

Another static type model is the random effect model though it has similarity with the previous static model; this model has superiority over the fixed-effect model as it is derived with fewer restrictions. The primary dissimilarity between the fixed effect and random effect model is that the latter considers the constants of the regression function for each cross country as random parameters are not fixed. Therefore, the random effect model addresses a cross-sectional effect to a greater extent as the differences across the country are assumed as random and uncorrelated with other dependent variables in the model. The random effect can be shown in the following manner:

$$a_i = a + v_i \quad (4)$$

where, v_i is a standard normal variable with zero mean, and "a" is a common intercept for all cross-sections.

3.3.4. Hausman test

Finally, the study runs the Hausman test to validate the suitable method between FE and RE models (Hausman, 1978). It is also used to compare the estimated coefficient of the FE from the RE model. The hypothesis for the Hausman are-

Ho = the suitable effect is random [i.e. consistent and efficient RE].
Ha = the fixed effect is appropriate [i.e. inconsistent RE].

If the probability of the cross-sectional chi-square is more than the 5% level, we do not reject the null hypothesis. It means the random effect estimators would be proper to explain the model. In case of less than 5% chi-square value, we reject the null hypothesis, which stands for using fixed-effect estimators (Rashid et al., 2020).

3.3.5. Multicollinearity

The study is based on panel data, so it requires a test to assess multicollinearity. Multicollinearity arises when independent variables in a regression model have a high degree of correlation. Having a collinearity problem in the data set may affect the model that leads to distortion of the regression results. The problem of multicollinearity occurs when the correlation coefficient between any two independent variables is above the threshold of 0.80 (Farrar and Glauber, 1967). In addition, the study deals with the variance inflation factor (VIF) test to validate whether the model is collinear. According to Hair et al. (1984), no multicollinearity exists in the model if the value of VIF of all variables is less than the threshold value of 10. Since a model can be skewed by high collinearity, we used both correlation coefficients between the variables and VIF to deal with the collinearity issue.

3.3.6. Heteroskedasticity test

Heteroskedasticity occurs when the error variance has a non-constant variance. With heteroskedasticity, we no longer have the "best" estimator, because error variance is biased due to incorrect standard errors, invalid t-statistics and F statistics. We have applied the Breusch-Pagan/Cook-Weisberg test (Cook and Weisberg, 1983) to check heteroskedasticity as the adaptation of the Breusch-Pagan test (Breusch and Pagan, 1979) is less vulnerable to violations of the normality assumption. Null and alternative hypotheses of this test are stated below:

Ho: the model is homoskedastic
Ha: the model is heteroskedastic

It is a chi-squared test: the test statistic is $n\chi 2$ with k degrees of freedom. It tests the null hypothesis of homoskedasticity. If the Chi-Squared value is significant with a p-value below an appropriate threshold (e.g. $p < 0.05$) then the null hypothesis of homoskedasticity is rejected and heteroskedasticity assumed and vice-versa. If a linear regression contains heteroskedasticity, we can say that rather than a uniform variance, the variance is influenced by one or more variables.

4. Results

4.1. Descriptive statistics

Table 1 presents the descriptive statistics of the data of sampled countries. From 1998 to 2015, the dependent variable (tax evasion) shows an average of 31.46% of GDP, a range of 17.89%–48.85%, and a standard deviation of 7.31%. The study shows that the average level of tax evasion in the SAARC region is quite high (31.46%) from the viewpoint of the world economy. It also indicates a significant variation in tax evasion across the countries over the study period. There are considerable variations in the independent variables too. The inflationary situation of South Asia shows a volatile - the range of inflation rate is -2.80%–

Table 1. Descriptive analysis.

Variable	Obs.	Mean	Std. Dev.	Min	Max
Tax evasion (TE)	126	31.46	7.31	17.89	48.85
Property right (PR)	126	39.33	12.95	20.00	70.00
Monetary freedom (MF)	126	72.18	4.94	56.8	81.8
Financial freedom (FF)	126	33.81	8.93	10.00	70.00
Investment freedom (IF)	126	35.28	13.33	5.00	70.00
Tax Rate (TR)	126	22.98	7.57	10.58	35.00
Government spending (GS)	126	70.17	29.30	0.00	94.50
Public sector governance (PSG)	126	-0.40	0.58	-1.18	2.77
Muslim (MUS)	126	44.55	43.76	0.15	98.42
Hindu (HIN)	126	29.74	32.94	0.50	81.30
Government integrity (GI)	126	30.25	12.24	4.00	63.00
Inflation (INF)	126	6.71	3.53	-2.80	19.56
Agriculture (AGR)	126	19.19	8.43	5.19	38.70
Unemployment (UNEM)	126	3.15	1.91	0.40	9.14
Tax revenue (TaxRev)	126	10.83	2.85	6.60	19.46
Gross domestic product (GDP)	126	1675.47	1861.10	210.61	9033.39

19.56% with a mean rate of 6.71%. The factors of economic freedom also vary significantly among SAARC countries. The public sector governance, which indicates the efficiency of the countries in implementing the rules of law, is low among the SAARC countries with a mean score of -0.40. Among all main religions in the South Asia region, Islam is at the top with a mean value of 44.55%, while the mean score of Hinduism 29.74%. Agriculture contributes one-fifth of the GDP. It shows an average contribution of 19.19% of the GDP to a country.

4.2. Pearson correlation

Table 2 represents the correlations among the variables. Among economic freedom, tax rate, government spending, investment freedom, and financial freedom are positively correlated with tax evasion, while property right is negatively related. Similarly, among the religions, the Hindu is negatively correlated, while the Muslim is negatively and insignificantly correlated. Moreover, unemployment and agriculture show a positive correlation with tax evasion.

4.3. Multicollinearity test

To identify the collinearity problem, we estimate the Pearson pairwise correlation among the independent variables. The finding of our correlation test is presented in Table 2. The highest degree of correlation, as estimated in our data set, is between Muslim and property rights (-0.73), which is still far below our threshold of 0.8 (Farrar and Glauber, 1967). Therefore, the results indicate that the data is free from the multicollinearity problem. Further, the study has applied VIF to confirm whether the multicollinearity exists in the model presented in Table 3. Since all the values of VIF are below the threshold of 10 (Hair et al., 1984); there is no collinearity problem in this study.

4.4. Heteroskedasticity

In our study, the chi-square value was small (0.10) and the p-value of chi-square is 0.748, indicating heteroskedasticity is not a problem in the OLS model of our study.

4.5. Regression analysis

We present the results of the regression analysis in Table 3 to test our hypotheses. We have applied the Ordinary Least Squares (OLS) and generalized least squares (GLS) of both fixed and random effect approaches.

First, the study found a negative and significant impact of property rights on tax evasion upholding the hypothesis H1a. The finding implies that the higher the rule of law in a country, the lower the level of tax evasion. Next, both fiscal freedom, monetary freedom, and investment freedom are negatively related to tax evasion supporting the hypothesis H1b, H1c, and H1d. On the other hand, our result did not confirm the H1e and H1f as financial freedom found positively significant, while government spending has an insignificant effect on tax evasion. Finally, the study documented a statistically significant negative relationship between public sector governance and religiosity (both Muslim and Hindu) on tax evasion; the results support hypothesis H2 and H3. In the case of the control variables, the regression coefficient of both agriculture and unemployment is positive and highly significant under all the models. Thus we can conclude that a higher unemployment rate and a higher level of agriculture lead to higher tax evasion across the SAARC countries.

4.6. Fixed effect, random effect and Hausman test

We have further explored the fixed effect and the random effect models. Among all the results, fiscal freedom (tax rate), economic freedom, government spending, public sector governance, and religiosity have significant impacts on tax evasion that support our hypothesis under both the models. On the contrary, investment and monetary freedoms have an insignificant impact on tax evasion under these models. The property right shows a mixed result. It discloses a negative and significant effect on tax evasion under the RE model but an insignificant impact under the FE model. However, to choose an efficient estimator between fixed and random effects, we have conducted another test named the Hausman test. The result discloses that the p-value for the chi-square statistic is (Prob > chi2 = 0.000) less than 5%, which means to reject the Ho of the test (Rashid et al., 2020). Thus there is no evidence that the fixed-effect model is inconsistent. So, the appropriate model seems to be the fixed-effect model that is efficient and consistent to explain the variables.

4.7. Additional tests

Further, the study has run some separate models using alternative variables to check the robustness of our baseline model. In column 1 of

Table 2. Pairwise correlations for dependent and independent variables.

	TE	PR	PSG	IF	MF	FF	TR	GS
TE	1.00							
PR	-0.15*	1.00						
PSG	-0.09	0.51***	1.00					
IF	0.17*	-0.10	0.00	1.00				
MF	0.08	-0.05	0.09	0.01	1.00			
FF	0.40***	0.16*	0.21**	0.41***	-0.06	1.00		
TR	0.20**	0.20**	0.06	0.46***	-0.40***	0.48***	1.00	
GS	0.36***	-0.01	-0.45***	0.18**	-0.27***	0.13	0.41***	1.00
MUS	-0.11	-0.73***	-0.38***	0.31***	0.03	-0.07	-0.09	-0.27***
HIN	-0.17*	0.28***	-0.04	-0.25***	-0.01	-0.16*	-0.01	0.34***
UNEM	0.42***	0.12	0.36***	0.19**	-0.14	0.25***	0.42***	-0.02
AGR	0.22**	0.09	-0.29***	-0.08	0.12	-0.01	-0.20**	0.60***

	MUS	HIN	UNEM	AGR
MUS	1.00			
HIN	-0.66***	1.00		
UNEM	-0.15*	-0.24***	1.00	
AGR	-0.37***	0.57***	-0.43***	1.00

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Table 3. Regression results (OLS, random, and fixed effect) on tax evasion.

Variables	VIF	OLS	FE	RE
Property rights (PR)	4.07	-0.488***	0.040	-0.410***
		(0.041)	(0.037)	(0.056)
Investment freedom (IF)	1.98	-0.101***	-0.011	0.018
		(0.030)	(0.017)	(0.038)
Monetary freedom (MF)	1.38	-0.158**	0.154***	0.164*
		(0.071)	(0.036)	(0.086)
Financial freedom (FF)	1.81	0.219***	-0.075**	0.141***
		(0.040)	(0.029)	(0.055)
Tax rate (TR)	4.33	0.172**	0.305***	0.321***
		(0.072)	(0.054)	(0.098)
Government spending (GS)	6.44	-0.020	-0.055**	-0.087***
		(0.024)	(0.024)	(0.031)
Public sector governance (PSG)	2.85	-3.748***	-0.945*	-3.931***
		(0.771)	(0.487)	(1.050)
Muslim (MUS)	9.57	-0.183***	-6.743***	-0.171***
		(0.018)	(1.375)	(0.025)
Hindu (HIN)	4.09	-0.165***	-4.852***	-0.178***
		(0.016)	(1.174)	(0.022)
Unemployment (UNEM)	2.16	1.185***	-0.101	1.515***
		(0.201)	(0.164)	(0.275)
Agriculture (AGR)	5.02	0.276***	0.559***	0.613***
		(0.079)	(0.077)	(0.095)
Year dummy		Yes		
_cons		61.772***	452.431***	23.756***
		(6.822)	(95.792)	(7.892)
N		126	126	126
F		32.661	29.824	
r2		0.875	0.752	
r2_adj		0.848	0.713	

Standard errors in parentheses.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Table 4, we have alternated the monetary freedom with inflation rate as the proxy of the country's financial freedom in line with the study of Nurunnabi (2018), we have found a positive relationship between inflation and tax evasion. The result implies that the higher the inflation and lower the monetary freedom, the higher the tax evasion. The finding is consistent with our baseline model, where we found high monetary freedom and low tax evasion. All other results in this model are similar to the baseline model. In column 2, we have used tax revenue as an alternative to government size rather than government spending. We found a positive relationship between tax revenue and tax evasion, but all other results remain consistent with the baseline model. In column 3, we have used government integrity as an alternative variable of public sector governance. We found a negative impact of government integrity on tax evasion, which is similar to the baseline model. In this model, all other results are also unchanged. In column 4 of Table 4, we added lGDP as an additional variable. We found an insignificant effect of lGDP on tax evasion, whereas all other results remain the same. Thus our outcomes are robust because all the models produce similar results.

Further, crisis dummy (CD)[3] has been added in column 5 of Table 4 to check whether the crisis period during 2008 has a significant impact on the overall results. The study found a significant negative influence of CD

on tax evasion. Therefore, we run two separate models. Columns 6 and 7 present the outcomes of before and after the crisis to investigate the impact of different public policies on tax evasion. The study found almost similar results in the before crisis (BC) model except for the insignificant effects of investment freedom and monetary freedom. Similarly, under the model of after crisis period, all other findings are similar except for the insignificant effect of tax rate and monetary freedom. However, under both before and after crisis models, government spending has a negative and statistically significant impact on tax evasion.

5. Discussions

South Asian countries have experienced a low tax to GDP ratio despite a strong growth trajectory during the last decade. These economics are characterized by a high rate of corruption and population growth as against low per capita income and weak legal enforcement, social security, and quality of life with an unfriendly environment for building alternative socio-economic organizations and systems for improved social welfare and environmental protection. All these have inspired the authors to lead this research. The study found a significant relationship between economic freedom and tax evasion in this region. Amid the determinants of economic freedom, we have seen the property right has a significant negative impact on tax evasion under all the models. So, all South Asian countries need to support the effective enforcement of laws to prevent tax evasion. This finding is in line with the prior studies of Deininger and Jin (2003) and Nurunnabi (2018). Applying OLS regression we have witnessed a significant negative impact of both the fiscal and monetary freedom on tax evasion, which suggests higher fiscal and

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[3] As the study conducts a cross-country investigation with both economic and non-economic factors, we have used crisis dummy to deal with the possible effect of the global financial crisis during 2008. We have divided the study period into two groups before the crisis and after the crisis and used dummy as 0 for before crisis (1998–2007) and 1 for after crisis (2008–2015).

Table 4. Additional tests.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	OLS	OLS	OLS	OLS-CD	OLS-BC	OLS-AC
PR	-0.490***	-0.469***	-0.394***	-0.486***	-0.488***	-0.394***	-0.311***
	(0.041)	(0.037)	(0.044)	(0.042)	(0.041)	(0.062)	(0.058)
PSG	-3.551***	-3.751***		-3.757***	-3.748***	-4.157***	-18.275***
	(0.771)	(0.656)		(0.775)	(0.771)	(0.944)	(2.369)
IF	-0.110***	-0.082***	-0.131***	-0.102***	-0.101***	-0.081	-0.041*
	(0.030)	(0.029)	(0.029)	(0.031)	(0.030)	(0.050)	(0.023)
MF		-0.211***		-0.157**	-0.158**	-0.072	-0.014
		(0.072)		(0.072)	(0.071)	(0.115)	(0.096)
FF	0.207***	0.183***	0.193***	0.227***	0.219***	0.075	0.136**
	(0.040)	(0.041)	(0.039)	(0.048)	(0.040)	(0.067)	(0.055)
TR	0.168**	0.116**	0.181**	0.163**	0.172**	0.327**	0.072
	(0.072)	(0.053)	(0.070)	(0.079)	(0.072)	(0.135)	(0.080)
GS	-0.005		0.004	-0.025	-0.020	-0.087*	-0.065***
	(0.024)		(0.022)	(0.030)	(0.024)	(0.044)	(0.016)
MUS	-0.181***	-0.178***	-0.188***	-0.185***	-0.183***	-0.130***	-0.280***
	(0.018)	(0.015)	(0.018)	(0.019)	(0.018)	(0.031)	(0.014)
HIN	-0.161***	-0.163***	-0.200***	-0.168***	-0.165***	-0.150***	-0.198***
	(0.016)	(0.014)	(0.018)	(0.018)	(0.016)	(0.024)	(0.012)
UNEM	1.100***	1.101***	0.812***	1.181***	1.185***	1.949***	0.972***
	(0.205)	(0.195)	(0.199)	(0.202)	(0.201)	(0.306)	(0.292)
AGR	0.199**	0.245***	0.196**	0.244*	0.276***	0.535***	0.002
	(0.083)	(0.051)	(0.081)	(0.132)	(0.079)	(0.184)	(0.101)
INF	0.247**		0.269***				
	(0.106)		(0.103)				
TaxRev		0.354***					
		(0.125)					
GI			-0.239***				
			(0.045)				
lGDP				-0.543			
				(1.809)			
CD					-3.322***		
					(1.244)		
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
_cons	50.724***	62.489***	57.491***	66.392***	61.772***	47.680***	45.688***
	(3.365)	(6.520)	(3.578)	(16.857)	(6.822)	(10.984)	(8.968)
N	126	126	126	126	126	70	56
F	32.863	35.328	34.906	30.969	32.661	18.238	84.611
r2	0.875	0.883	0.882	0.875	0.875	0.874	0.972
r2_adj.	0.849	0.858	0.856	0.846	0.848	0.826	0.961

Standard errors in parentheses.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.
CD = Crisis Dummy, BC = Before Crisis and AC = After Crisis.

monetary freedom would lower the level of tax evasion. A higher tax rate (financial freedom) increases tax evasion to a significant extent (Androniceanu et al., 2019; Pappa et al., 2015). Likewise, the link between high monetary freedom and low tax evasion also recommends high monetary freedom. More specifically, the inflation rate needs to be reduced as we documented tax evasion goes up due to the high inflation rate; the finding is harmonious with the study of Nurunnabi (2018). The result implies that people look reluctant to pay taxes with an increased tax rate and inflation. Hence, policymakers should be sagacious while changing the tax rate and managing inflation in the economy. Also, the study has investigated the impact of two components of open market freedom viz. investment freedom and financial freedom on tax evasion. Investment freedom shows a significant and negative effect on tax evasion that

implies that investment can create possibilities for entrepreneurs through enhancing economic development, improving productivity, and generating more employment (Alabede, 2018). Concomitantly, a significant and positive effect of financial freedom on tax evasion that implies more autonomy for banks and non-bank financial institutions may increase tax evasion. Hence, the study proposes that policymakers should promote a capital market that is free from all sorts of manipulations and ensure a considerable degree of control over the money market (banks and non-bank financial institutions) that will reduce tax evasion significantly. Though the study did not record any significant result of government size in the baseline model, the study found a negative and significant effect on tax evasion in the models of before and after financial crises. It indicates an association between a high level of government spending and a low

level of tax evasion. Hence, proper state spending has a significant impact on the tax evasion behavior of taxpayers. The public accepts the tax authority as legitimate when the taxation system is fair, and only then the government spending is beneficial and effective in controlling tax evasion (Alasfour, 2019). Moreover, public sector governance has a significant and negative impact on tax evasion under all the models; the result is compatible with the prior studies (Feld and Frey, 2002; Torgler and Schneider, 2009; Yamen et al., 2018). The finding is more robust when used government integrity in place of public sector governance as we found similar results. When the government and its administrative organs encourage accountability, political stability, management efficiency, governance quality, rules of law, and curb corruption, then people believe their government is sincerely protecting their interests. So, if a country has good governance in the public sector, there must be a lower level of tax evasion. This situation suggests that good governance can improve people's trust in the governance mechanisms, which drives them to pay more tax. Finally, the study examined the impact of religions on tax evasion. Both Islam and Hinduism have a negative effect on tax evasion under all models supporting the results of Torgler and Schneider (2009). Based on our coefficient estimation, the study found the higher religious faith of the people, the lower the tax evasion. As religiosity has a positive effect on daily life (Nazaruddin et al., 2018), our study corroborates the finding of Torgler (2006) that religious faith has a high impact on the tax morale of taxpayers that, in turn, influence their tax compliance. Hence, the findings suggest religiosity and experiences of citizens of a country shape the social norms, and an established religious practice discourages all atypical human behavior that, in turn, reduces the level of tax evasion.

However, the study has several limitations. Firstly, it has reviewed only the SAARC countries, so the findings of this study are not enough to generalize for all the economies, particularly for the developed economics. Secondly, out of the twelve factors of economic freedom, we have examined only six. Future studies may analyze business freedom, trade freedom, judicial effectiveness, fiscal health as relevant in this regard. Thirdly, we have considered public sector governance as an average of six WGI in line with the study of Nurunnabi (2018), that may not represent the impact of all the indicators on tax evasion. Fourthly, some values of the correlation coefficient and VIF in our study are high and could potentially create multicollinearity problem; these results are due to the limitations of economic freedom and WGIs data since they have large standard errors and construct validity (Thomas, 2010; Yamen et al., 2018). Thus readers must be cautious in interpreting our results. Finally, the religiosity of a country is a source of taxpayers' ethical character though culture and socio-economic systems help develop their values. We have not studied those factors. Thus in light of the limitations, future researchers may include all moral as well as institutional factors in their model. Such inclusive research may provide robust results in determining the factors influencing tax evasion.

6. Conclusion

The interplay between public policy and tax evasion has attracted academic researchers, think tanks, and policymakers in many countries. Nevertheless, there is a scarcity of research on this important issue using the SAARC context that causes this study. Findings of the study have provided some new insights into the administrative policies for tax collection, surveillance of legal compliance by tax regulatory officials, drafting of a legal framework by lawmakers, and efforts to collect tax revenue by tax officials of the respective SAARC country. These could help design an appropriate taxation system for reducing tax evasion and thereby raising the government tax revenue. The study also offers the following policy implications for successful tax planning. Firstly, the government should ensure an economic environment having a higher level of property right, higher fiscal freedom (lower tax rate), higher monetary freedom (lower inflation), and higher investment freedom with the controlled financial freedom to motivate citizens to make more

contributions to the state exchequer in the form of tax revenue arising from low tax evasion. Second, the study finds that public sector governance as an institutional norm plays an influential role in curbing tax evasion. The SARRC countries should give importance to the use of Worldwide Governance Indicators (WGI) as these reduce the level of tax evasion. Finally, the study suggests that the governments of the SAARC countries should stress more on practicing religious activities as it keeps people disassociated from all atypical forms of human behavior and also motivate them to evade tax.

To sum up, the study provides governments and policymakers with a clear understanding of the critical variables associated with tax evasion globally. Governments and tax authorities can address tax evasion problems and increase tax revenue by developing and implementing excellent strategies at the right time in the right place. The study also contributes some new insights into the existing knowledge of taxation and tax evasion to help extend the socioeconomic theory. The study findings will encourage researchers and tax practitioners interested in an in-depth study on useful tax forecasting, planning, and controlling in future. Moreover, exploring some other economic and non-economic factors of tax evasion and using the cross-regional inquiry, research may be conducted.

Declarations

Author contribution statement

M.H.U. Rashid: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

A. Islam: Contributed reagents, materials, analysis tools or data; Wrote the paper.

R. Hashmi: Contributed reagents, materials, analysis tools or data.

S.Z. Hossain: Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

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