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Цель журнала "Journal of Tax Reform" – представление значимых выводов оригинальных социо-экономических исследований, проведенных специалистами разных стран в области налоговых реформ и налогообложения в целом.

В журнале публикуются оригинальные эмпирические и обзорные статьи, связанные с административно-управленческими, экономическими проблемами налоговых реформ, а также рассматривающие вопросы, связанные с историей налоговых реформ и практикой противодействия уклонению от уплаты налогов.

Journal Policy

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The Journal publishes original empirical and review articles elucidating administrative-managerial and economic problems in tax reform, as well as those discussing issues related to historical tax reform and practices for countering tax evasion.

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Vol. 8, no. 3

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Journal of Tax Reform

T. 8, № 3

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Vol. 8, no. 3

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Journal of Tax Reform

Т. 8, № 3

2022

Vol. 8, no. 3

СОДЕРЖАНИЕ

ЭКОНОМИЧЕСКИЕ ПРОБЛЕМЫ НАЛОГОВЫХ РЕФОРМ

- Гюльшен М.А.** Влияние фискальной политики на бизнес-циклы в Турции..... 218
- Тошматов Ш.А., Абдуллаев З.А., Ахроров З.О.** Влияние налога на прибыль на резерв по кредитным убыткам: доказательства из Узбекистана..... 236

ЭКОНОМИКО-МАТЕМАТИЧЕСКИЕ МОДЕЛИ НАЛОГОВЫХ РЕФОРМ

- Малкина М.Ю., Балакин Р.В.** Индекс стресса налоговой системы Российской Федерации по налоговым доходам 251

СОЦИОЛОГИЯ И ПСИХОЛОГИЯ НАЛОГООБЛОЖЕНИЯ

- Нигату А.Г., Белете А.А.** Детерминанты соблюдения налогового законодательства плательщиками налога на доходы в регионе Афар, Северо-Восточная Эфиопия 270
- Шарма А., Шарма Р.** Изучение факторов принятия налоговых решений: точка зрения налоговых консультантов Северной Индии..... 285

ПРОТИВОДЕЙСТВИЕ УКЛОНЕНИЮ ОТ УПЛАТЫ НАЛОГОВ

- Манрехо С., Юлаэли Т.** Планируемое поведение налогоплательщиков как основа для реализации модели налогового комплаенса в Индонезии..... 298
- Аль-Магреби М.С., Сапеи Н.Ш., Абдулла М.** Власть, доверие и прозрачность как определяющие факторы соблюдения налогового законодательства: систематический обзор литературы 312

Journal of Tax Reform

T. 8, № 3

2022

Vol. 8, no. 3

CONTENTS

ECONOMIC ISSUES OF TAX REFORMS

- Gülşen M.A.** The Effect of Fiscal Policies on Business Cycles in Turkey.... 218
- Toshmatov S.A., Abdullaev Z.A., Ahrorov Z.O.** Influence of Corporate Income Tax to Loan Loss Provision: Evidence from Uzbekistan..... 236

ECONOMETRIC MODELS OF TAX REFORMS

- Malkina M.Yu., Balakin R.V.** Stress Index of the Tax System of the Russian Federation in Terms of Tax Revenues 251

SOCIOLOGY AND PSYCHOLOGY OF TAXATION

- Nigatu A.G., Belete A.A.** Determinants of Business House Rental Income Taxpayers' Compliance with Tax System in Afar Region, Northeast Ethiopia..... 270
- Sharma A., Sharma R.** Exploring Tax Decision Factors: A Perspective from North Indian Tax Practitioners..... 285

ACTIONS AGAINST TAX EVASION

- Manrejo S., Yulaeli T.** Tax Compliance Model Based on Taxpayers Planned Behavior in Indonesia..... 298
- Al-Maghrebi M.S., Sapiei N.S., Abdullah M.** Power, Trust and Transparency as Determinant Factors of Tax Compliance: A Systematic Review 312

Original Paper


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The Effect of Fiscal Policies on Business Cycles in Turkey

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ABSTRACT

Fiscal policies are designed to balance cyclical fluctuations. Fiscal policies in developed countries are mostly countercyclical. However, fiscal policies alone cannot explain the cyclical effect of fiscal policies implemented in developing countries. This is due to weak institutional structures, political restrictions, and populist practices. The study examined the effect of fiscal policies on business cycles in Turkey between 1975–2020 using the ARDL model and annual data. According to the findings, public expenditures, investment expenditures, tax revenues, direct tax revenues, and budget balance increase the output gap. On the other hand, trade openness, government transfer payments, and indirect tax revenues reduce the output gap. Based on the empirical findings, the following comments can be made: (a) fiscal policy can be considered cyclical in this period; (b) cyclical fluctuations are reduced in open economies; (c) budget balance increases cyclical fluctuations (non-Keynesian effect). A possible reason for this is that the budget revenues mainly consist of indirect tax revenues (70% in Turkey). The significance of the results obtained in the study are as follows: (1) analyzes the impact of fiscal policies implemented by a developing economy on stability using a current and long time series; (2) provides an insight into the institutional quality and response of implemented fiscal policies through short- and long-term analysis; (3) analyzes the effect of Turkey's ability to implement fiscal policies, which prefers the global markets integration model, and the tax technique it creates, on the economy.

KEYWORDS

fiscal policy, fiscal stabilization, output volatility, tax revenues, business cycles, ARDL model, Turkey


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Влияние фискальной политики на бизнес-циклы в Турции

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АННОТАЦИЯ

Фискальная политика, призванная сбалансировать циклические колебания в развитых странах, в основном носит контрциклический характер. Однако сама по себе налогово-бюджетная политика не может объяснить циклический эффект налогово-бюджетной политики, проводимой в развивающихся странах. Это связано со слабыми институциональными структурами, политическими ограничениями и populistскими практиками. В исследовании изучалось влияние налогово-бюджетной политики на деловые циклы в Турции в период с 1975 по 2020 г. с использованием модели ARDL и годовых данных. Согласно полученным данным, государственные расходы, инвестиционные расходы,

налоговые поступления, прямые налоговые поступления и баланс бюджета увеличивают разрыв выпуска. С другой стороны, открытость торговли, государственные трансфертные платежи и поступления косвенных налогов сокращают разрыв выпуска. На основе эмпирических данных можно сделать следующие комментарии: (а) фискальную политику можно считать циклической в этот период; (б) циклические колебания снижаются в странах с открытой экономикой; (с) баланс бюджета увеличивает циклические колебания (не кейнсианский эффект). Возможной причиной этого является то, что доходы бюджета состоят в основном из косвенных налоговых поступлений (70% в Турции). Значимость результатов, полученных в исследовании, заключается в следующем: (1) анализ влияния фискальной политики, проводимой развивающейся экономикой, важен для исследования стабильности экономики с использованием текущего и длительного временных рядов; (2) дает представление об институциональном качестве и реакции на проводимую налогово-бюджетную политику посредством краткосрочного и долгосрочного анализа; (3) анализирует влияние на экономику способности Турции проводить налогово-бюджетную политику, реализующую модель интеграции в мировые рынки и совершенствование налоговой техники.

КЛЮЧЕВЫЕ СЛОВА

фискальная политика, фискальная стабилизация, волатильность выпуска, налоговые поступления, деловые циклы, модель ARDL, Турция

1. Introduction

Cyclical fluctuations are fluctuations that are periodically repeated but not systematic and therefore difficult to predict. Although the conjuncture is a concept that concerns more than one macroeconomic size, in practice it is measured by the change in real GDP. There is no consensus in the literature on the reason for these periodic fluctuations in real GDP. According to Keynes [1], the reason for the conjuncture is the changes in the expectations regarding the profitability of investments, while according to M. Friedman [2], the changes in the money stock. According to the real business cycle theory pioneered by E. Prescott [3], technology shocks cause fluctuations [4, p. 82; 5, p. 218; 6, pp. 3–4].

According to the report [7] prepared with the contributions of Celasun & Rodrik, the first measure taken against cyclical fluctuations in Turkey is the adoption of the balanced budget principle. After WW2, national fiscal policies were not sufficient for the fluctuations in the macroeconomic structure and the first agreement was made with the IMF in 1961. Then, external shocks occurred in the economy due to the 1973 and 1978 OPEC crises. In the 1990s, macroeconomic instability continued, and budget deficits increased rapidly. In 1999,

macro instability in the public sector increased and a new stabilization program was implemented under the leadership of the IMF. Although there was a relative improvement because of the establishment of fiscal discipline, a new crisis occurred in 2001.

During these years, the total foreign debt interest payments in the budget increased and as a solution to this, the Transition to a Strong Economy Program was prepared with the IMF in 2002. Thus, the contractionary fiscal policy began systematically in Turkey. In this period, the share of current and investment expenditures in the budget was reduced and a Special Consumption Tax was adopted in terms of income policy. Therefore, discipline in public finance was targeted by following pro-cyclical policies. As of 2022, the foreign exchange and debt crisis in Turkey continues with the effect of low interest (neo-Fisherian) policy, even though it is tried to be prevented with various tax reforms.

This study aims to analyze the effect of fiscal policies against cyclical fluctuations between 1975–2020 in Turkey. The method of the study is the ARDL-ECM method, which shows the short- and long-term cointegration relationship

between the variables. The reason for choosing this method is to reveal how long it will take for the cyclical fluctuations to come back into balance with the long-term effect of the fiscal policies pursued fluctuations in GDP.

The theoretical structure and literature will be presented in the first part of the study. In the second part, the data set and method to be used in the study will be explained. The present study will be concluded with the discussion and conclusion part after the findings are stated.

In this research, *three hypotheses* are tested:

H1: Fiscal policy in Turkey is *pro-cyclical*.

H2: Fiscal policy in Turkey is *counter-cyclical*.

H3: Fiscal policy in Turkey is *neutral*.

2. Theory and Literature

The business cycle theories should help us understand the important features of the widespread and persistent fluctuations observed in the economy. Early writers on the subject highlighted the instability of the supply of credit used to purchase real and financial assets, as well as investment in fixed capital and stocks. Changes in relative input and output prices, interest rates, and profits are other important areas of interest.

Keynes [1] also drew attention to the uncertainty regarding future commercial ventures' "profitability and expectations" volatility. He was among the first discoveries of the investment accelerator, growth, and instability theories. With the rise of mathematical analysis in the 1930s-1940s, exogenous models were studied, which often had similar content to accelerator-multiplier models but were driven by shocks. Money and prices have received little or no consideration in the accelerator-multiplier interaction and other Keynesian disequilibrium models. In contrast, shocks to the money stock represent the major source of instability in monetarist theory [8, pp. 2–3].

The idea of countercyclical fiscal policy, first put forward by Juglar [9], has

been described as a "response to welfare". Juglar says that the most important cause of depression is the welfare period. He argues that the reason for economic prosperity lies in the conditions of easy money, low stocks, cheap labor, and raw materials in times of depression and that prosperity is only a result of these. W. Mitchell [10; 11] was the one who took this subject scientifically in the public finance literature [12, p. 143]. In addition, many opinions explain business cycle fluctuations in the fiscal literature.

According to the Keynesian approach, there are many reasons for fluctuations. The most important of these are marginal productivity of capital and liquidity preference. This is affected by expectations of future sales and profits [13, p. 157]. In Keynesian theory, the business cycle mechanism has two components: the multiplier effect and the response of aggregate supply to the change in aggregate demand. Also, expectations are important in cyclical fluctuations. Accordingly, if the expectations are positive, from the recovery period; if negative, it refers to the crisis circuit [14, pp. 16–18]. As a result, it is necessary to intervene in the economy with fiscal policies based on market failures.

According to the Monetarist approach, the cause of cyclical fluctuations is the fluctuations in the money supply realized by monetary policies [15, pp. 44–45]. Monetarists emphasize the inconsistencies between the changes in the supply of bank credit and the market and the equilibrium interest rates as the cause of the fluctuations. Falling interest rates due to the Central Bank's increase in money supply increase aggregate demand by increasing investments and consumption and bringing the economy to the recovery stage. On the other hand, the long-term decline in the monetary growth rate leads the economy into recession [16, p. 740].

According to the Rational Expectations Theory first proposed by Muth [17], money wages are determined by rational expectations. However, there are two different rational expectations regarding the economic conjuncture. First, Lucas [18, p. 13–15], fluctuations are caused by

unexpected shocks in aggregate demand, which distorts the relationship between the rate of change in nominal prices and the level of real output. According to the New Keynesian Business Cycle Theory, which is another approach, the cause of fluctuations in the economy is expected and unexpected fluctuations in aggregate demand. Accordingly, fluctuations are affected by changes such as technology and population. However, what all Keynesians agree on is their advocacy of fiscal policies in stabilizing economic activity [19, p. 23]. Cyclical fluctuations cannot be explained independently of monetary policies. However, to prevent cyclical fluctuations, fiscal policies should guide monetary policies [20, pp. 255–256].

The Real Business Cycle Theory argues that macroeconomic instability will occur in the long run due to external shocks. This theory argues that instabilities arise not from instability caused by the money supply, but from shocks caused by fiscal policies. The main reason behind fluctuations is changes in productivity. Accordingly, macroeconomic stability is ensured due to innovation and the productivity increase it creates [21, p. 251].

According to the theory, fiscal policy should be countercyclical throughout the cycle. Contrary to this approach, many countries follow cyclical policies in practice [22, pp. 14–15]. These studies in the literature show that economic crises are not only related to monetary and fiscal policies, but also the political structures of countries.

Çiçek & Elgin [22] used annual panel data for 78 countries between 1960–2007. Empirical analyzes were made with section, OLS, and IV techniques. Fiscal policy is more cyclical in countries with large informal economies. They also found that policies that reduce the size of the informal economy cause less fiscal responsiveness to shocks. Due to the high demand for the public sector, the counter-cyclical policy is expected to increase production overall, as it creates more jobs and increases disposable income [23, p. 76].

Temsurit [23] used annual panels for 63 developing countries between 1980–2013.

Empirical analyzes were performed using the GMM method. According to the findings, the improvement in the quality of institutions plays a vital role in limiting cyclical policy and these effects are more pronounced in democratic countries than in non-democratic ones.

Gavin & Perotti [24] used annual panel data for 13 Latin American countries from 1968–1995. Empirical analyzes were performed using the OLS. They found that fiscal policy is cyclical, especially during growth periods. In addition, in times of crisis, countries cannot borrow from abroad due to credit restrictions and therefore cannot use borrowing as a balancing fiscal policy tool. As a result, states must apply cyclical policies because they have to pay their debts [25, p. 4].

Calderón & Schmidt-Hebbel [25] tested with the OLS model using annual panel data for 136 between 1970–2005. Institutional factors explain most of the differences in the cyclical behavior of budget balances between industrial and developing countries, while financial openness and financial depth account for a smaller share of projected differences.

Fatás & Mihov [26] tested OLS and IV techniques for 93 developing countries using annual panel data from 1960–2007. They found that fluctuations are an important determinant of economic growth. They also found that public expenditures and revenues are not cyclical, and the primary deficit is not cyclical.

Rodrik [27], who also associates cyclical fluctuations with trade openness, states that as the number of external shocks increases, their negative effects on GDP increase, and there is a positive relationship between trade openness and public expenditures.

Alesina et al. [28] tested 87 OECD and non-OECD countries between 1960–1999 using the fixed effects technique. According to the findings, public revenues and budget surplus variables are statistically insignificant and only public expenditures are significant. In addition, it was emphasized that developed countries implement counter-cyclical policies while developing countries implement cyclical policies.

Kaminsky et al. [29] tested 104 emerging markets (EMs) between 1960–2003 with the OLS using panel data. Moreover, fiscal policies in developing countries are cyclical compared to OECD countries.

Ilzetzki & Végh [30] conducted tests with OLS and GMM using quarterly 1960–2006 panel data for 49 developing countries. In the study, there is a positive relationship between public consumption expenditures and output volatility in developing countries.

Badinger [31] tested 88 developing countries using annual panel data from 1960–2004, LS, and One Step Regression techniques. According to the findings, output volatility resulting from changes in cyclical and discretionary fiscal policy is negatively related to economic growth. The study advocates fiscal rules that limit the use of cyclical policy to improve growth performance.

Manasse [32], who relates the fiscal policies followed for fluctuations with political behavior, tested 50 developing countries between 1970–2004 with the MARS technique. The study argues that the policy response depends on the state of the economy and is cyclical during a growth period, but counter-cyclical fiscal policies are implemented during a recession. He argued that in countries where populist policies are common, fiscal stability can be prevented by fiscal rules and that counter-cyclical fiscal policies will have a stronger effect.

Studies in the literature have concluded that developing countries implement cyclical fiscal policies. Research on why governments follow a cyclical policy in developing countries claims that political factors are an important reason for the cyclical fiscal policy in these countries. These studies show that factors such as the type of political regime, the quality of institutions, and the level of political polarization determine cyclical fiscal policy [23, p. 75].

Vegh & Talvi [33] present a model that optimizes behavior for 56 countries that reveal political distortions during periods of growth. The study primarily explains the cyclical fiscal policies in de-

veloping countries where there are political distortions. According to the research, implementation of cyclical fiscal policies is preferred because it is low cost.

Lane [34] tested with the OLS using 1960–1998 panel data for 22 OECD countries. According to the findings, cyclical fiscal policy is more effective in countries with a separation of political powers.

On the other hand, Abbott & Jones [35] carried out a test with the GMM using the 1990–2003 panel data for 20 OECD countries. The study revealed that the cyclicity of social security expenditures varies according to the level of political polarization. Accordingly, if political polarization increases, cyclicity also increases.

Caballero & Krishnamurthy [36] tested 18 developed countries and 13 EMs separately with OLS and IV for the years 1960–2002. According to the findings, they concluded that the fiscal policy of developing countries is more cyclical than that of developed countries, and the use of fiscal policy as a counter-cyclical policy tool is also related to the development of countries.

Wyplosz [37] made separate time series analyses for the USA, Germany, France, and Sweden countries between 1971–2001 using the OLS. According to the findings, the budget balance acts against the conjuncture and the public debt creates a balancing effect on the size of the output gap.

Akanni & Osinowo [38] tested Nigeria for the period 1970–2010 with the OLS. In the study, it is seen that both growth and public expenditures have high volatility. He also states that fiscal discipline is necessary to prevent fluctuations in Nigeria.

De Mello [39] tested Brazil for the period 1995–2004 with the OLS. The study revealed that governments respond strongly to changes in borrowing by adapting their primary surplus targets and institutions are important for fiscal sustainability.

Khemani [40] examined the effects of elections on fluctuations in India between the years 1960–1992 using the OLS. He

concluded that before election periods, governments made expenditures on interest groups with populist expenditures.

Jad [41] studied Lebanon using the Bry-Boschan routine technique with data covering the years 1993–2015. According to the findings, fluctuations are seen in four-year cycles in Lebanon. Thus, the findings for Lebanon are like the cycles attributed to small and developing countries with open market economies.

Mora [42] investigated the sources of macroeconomic fluctuations for Venezuela between 1998–2014 using the structural VAR model. The study cited US production and oil prices as sources of external shocks. As a result, he determined that the most important source of volatility, in the long run, is not domestic shocks, but external shocks from developments in US output and oil prices. In addition, the effects of local shocks are temporary. The effects of oil price shocks on real exchange rates and production are greater than their effects on US production.

Considering the effect of fiscal policies on cyclical fluctuations, the statistical significance of fiscal policy variables is quite low. In this respect, it is not always possible to explain the effect of fiscal policy on cyclical fluctuations due to various uncertainties [26, p. 364].

The common aspects of the studies in the literature are as follows: (i) pro-cyclical policies are generally followed in developing countries; (ii) fiscal policies are cyclical in economies with the informal economy, corruption, and populist policies; (iii) fiscal rules that limit the use of cyclical policy need to be introduced to improve growth performance.

Undoubtedly, these partnerships in the literature differ according to the model applied, period, and country. The current study, unlike the studies in the literature, examines the effect of fiscal policies implemented in Turkey on cyclical fluctuations, considering a current and long time series. This indicates the effectiveness of the fiscal policies discussed in the literature of Turkey, which has passed from a closed economic system to an open market economy.

3. Data Set and Method

3.1. Variables Used in the Model

The variables and methodology used in the study were prepared using Temsumrit [23].

Macroeconomic variables consist of the output gap, trade openness, and capital account openness. output gap represents the difference between current and potential GDP. GDP output volatility data was obtained by using the filtering method proposed by Hodrick & Prescott [44] to the real GDP variable, and it was aimed to measure the response of fiscal policies to aggregate supply and aggregate demand volatility. Theoretically, the deviation of actual output from potential output is an output gap that must be eliminated through fiscal policy mechanisms. To calculate this volatility, the use of Hodrick & Prescott's [44] filtering technique, which is widely used in the literature, is suggested by Ganey [45].

The trade openness variable is the ratio of total foreign trade volume to GDP. Economies with a high trade openness have a higher risk of facing external shocks. For this reason, it is necessary to use fiscal policies actively to ensure macroeconomic stability. In economies exposed to external shocks, when public expenditures are increased to reduce the impact of the shock, a counter-cyclical policy is followed [27, p. 1011].

The capital account openness variable is an index that shows the changes in the capital flows of the countries. Due to the influx of foreign capital in the expansion period of the economy, the financing cost of counter-cyclical policies increases. In addition, the fiscal policies pursued by the instability caused by capital mobility remain insufficient in the post-instability period [46, p. 206], [47, p. 252].

Fiscal variables (as a ratio to GDP), tax revenues, primary public expenditure, public expenditure including interest, current public expenditure, public investment expenditure, public transfer expenditure, tax revenues on goods and services, tax revenues on income, and budget consists of balance variables. In the study, GDP was taken as a ratio to indicate the elasticity of

these variables. If there is an increase in financial variables while the economy is growing, pro-cyclical; otherwise, it means that a counter-cyclical fiscal policy is followed.

The political variables are institutionalized democracy and political constraint-POLCON. Institutionalized democracy measures the institutionalization of democratic rights in the relevant country. The fact that institutions are open and independent to stakeholders increases their tendency to act democratically. In this respect, counter-cyclical policies are unsuccessful in countries that do not have democratic institutions [23, p. 76].

The political constraint, on the other hand, considers the number of vetoes faced by government officials in parliament and the party differences to which the members of the government belong. Restriction of governments also affects the quality of fiscal policies. In this context, institutions are an intermediary institution that affects macroeconomic growth [26, p. 368]. Governments that are less constrained in implementing policies can respond more flexibly to the business cycle. However, although this effect of POLCON is uncertain, it continues to be proven empirically [31, p. 9].

Population data was used as the control variable in the study. Change in pop-

ulation affects fiscal policy choices. However, Barro [48, p. 165] says that making any inferences on the population variable will usually be the result of coincidence. For this reason, the population variable was used as a control variable in the study and was excluded from interpretation.

By using the variables explained above, cyclical policies in Turkey between 1975–2020 were examined using ARDL-ECM estimators with annual data. Information on related variables is shown in Table 1.

The models included in the study are as follows:

$$\text{Model 1: } GHP = a_0 + a_1TI + a_2GEEI + a_3TO + a_4CAO + a_5POLCON + \mu_{1t} \quad (1)$$

$$\text{Model 2: } GHP = a_0 + a_1TI + a_2GEEI + a_3TO + a_4CAO + a_5POLCON + \mu_{2t} \quad (2)$$

$$\text{Model 3: } GHP = a_0 + a_1CTE + a_2IE + a_3TE + a_4TI + a_5TO + a_6CAO + a_7POLCON + \mu_{3t} \quad (3)$$

$$\text{Model 4: } GHP = a_0 + a_1ITI + a_2DTI + a_3CAO + a_4POP + \mu_{4t} \quad (4)$$

$$\text{Model 5: } GHP = a_0 + a_1FB + a_2CAO + a_3TO + a_4IND + a_5POLCON + \mu_{5t} \quad (5)$$

The constant term a_0 in Model 1–5, $a_1 \dots a_7$ is the parameter that shows the effect of the relevant independent variable on the dependent variable; $\mu_{1t} \dots$ represents the error term of the relevant model.

Table 1

Variables Used in the Model

Variable	Abbreviation	Source
GDP output volatility (HP Filter)	GHP	World Bank, World Development Indicators
Trade openness	TO	
Capital account openness	CAO	The Chinn-Ito index (KAOPEN)
Tax Revenues/GDP	TI	
Tax revenues from goods and services	ITI	
Tax revenues on the income	DTI	
Non-interest public expenditure / GDP	GEEI	Strategy and Budget Department, Indicators and Statistics
Public expenditure/GDP (including interest)	GEEI	
Current expenditure	CTE	
Investment expenditure	IE	
Transfer expenditure	TE	
Budget balance/GDP	FB	
Political Constraint	POLCON	Political Constraint Dataset
Institutionalized Democracy	IND	World Bank, World Development Indicators
Population	POP	

Model 1 [28], one of the regression equations above, the effects of TI, GEEL, TO, CAO, and POLCON on GHP; in the Model 2, unlike Model 1, the effect of GEII is estimated. Model 3, public expenditures specified the Model 1 are divided into components and discussed in terms of IE, TE, and CTE [26; 35]. In Model 4, the effect of ITI and DTI on GHP is examined, and in the Model 5 the effect of FB, IND, and POLCON variables is examined [24].

3.2. ARDL Model

The ARDL model was first introduced by Charemza & Deadman [49] and developed by Pesaran [50], Pesaran & Shin [51], and Pesaran et al. [52]. This approach is a cointegration method used to test whether there is a long-term equilibrium in the economic system. In the ARDL model, after specification tests are performed, boundary tests are applied and then the short-run relationship is examined.

This model has many advantages over other cointegration methods such as Engle & Granger [53], Johansen & Juselius [54]:

- This method gives ARDL consistent results for small observations, unlike the Johansen cointegration method, which requires a large observation to ensure the reliability of the results.
- The ARDL test can be used regardless of whether the variables are I(0)-(I) or (I)-(I).

• To estimate the long-term equilibrium relationship in the model, it is sufficient to compare the F statistic calculated with the ARDL error correction model (ECM) with the given lower and upper values.

In this respect, it is more advantageous to use a single-stage ARDL-ECM model instead of using a two-stage regression such as Engle & Granger cointegration [53] and Johansen cointegration [54]. In this framework, (p,q) ARDL regression model can be expressed as follows:

$$\begin{aligned}
 & s_t + \beta_1 s_{t-1} + \dots + \beta_p s_{t-p} = \\
 & = \delta + \alpha_0 x_t + a_1 a_{t-1} + \dots + a_q x_{t-q} + \epsilon_t; \quad (6) \\
 & \beta(L)y_t = \delta + a(L)x_t + \epsilon_t.
 \end{aligned}$$

In the equation (6), L is the distributed delay component and ϵ_t is a random error term. In addition, the model is autoregressive because the y_t expression is explained with its lagged values.

3.3. Methodology

In the present study, firstly, two-unit root tests, Dickey-Fuller (ADF) test [55] and Phillips & Perron (PP) test [56], were performed. The null hypothesis of ADF and PP tests is that the variable is non-stationary or contains a unit root. The key point in unit root tests for variables is that the variables are stationary at the I(0) or I(1) level. According to Ouattara [57], if the variables are stationary at I(2) or higher, the calculated F-statistic is invalid.

Secondly, the model is determined for the ECM. Before the estimation of the model, the VAR model determines the lag lengths of the model. The ARDL model used in the study is given below:

Model 1:

$$\begin{aligned}
 \Delta GHP_t = & a_{01} + \sum_{i=1}^p \beta_{1i} \Delta TI_{t-i} + \\
 & + \sum_{i=0}^{q1} \beta_{2i} \Delta GEEL_{t-i} + \sum_{i=0}^{q2} \beta_{3i} \Delta TO_{t-i} + \\
 & + \sum_{i=0}^{q3} \beta_{4i} \Delta CAO_{t-i} + \\
 & + \sum_{i=0}^{q4} \beta_{4i} \Delta POLCON_{t-i} + \\
 & + \delta_{11} TI_{t-1} + \delta_{21} GEEL_{t-1} + \delta_{31} TO_{t-1} + \\
 & + \delta_{41} CAO_{t-1} + \delta_{51} POLCON_{t-1} + \epsilon_{1t}
 \end{aligned} \quad (7)$$

Model 2:

$$\begin{aligned}
 \Delta GHP_t = & a_{02} + \sum_{i=0}^p \beta_{1i} \Delta TI_{t-i} + \\
 & + \sum_{i=0}^{q1} \beta_{2i} \Delta GEII_{t-i} + \sum_{i=0}^{q2} \beta_{3i} \Delta TO_{t-i} + \\
 & + \sum_{i=0}^{q3} \beta_{4i} \Delta CAO_{t-i} + \delta_{12} TI_{t-1} + \\
 & + \delta_{61} GEII_{t-1} + \delta_{32} TO_{t-1} + \delta_{42} CAO_{t-1} + \epsilon_{2t}
 \end{aligned} \quad (8)$$

Model 3:

$$\begin{aligned}
 \Delta GHP_t = & a_{03} + \sum_{i=0}^p \beta_{1i} \Delta CTE_{t-i} + \\
 & + \sum_{i=0}^{q1} \beta_{2i} \Delta IE_{t-i} + \sum_{i=0}^{q2} \beta_{3i} \Delta TE_{t-i} + \\
 & + \sum_{i=0}^{q3} \beta_{4i} \Delta TI_{t-i} + \sum_{i=0}^{q4} \beta_{5i} \Delta TO_{t-i} + \\
 & + \sum_{i=0}^{q5} \beta_{6i} \Delta CAO_{t-i} + \sum_{i=0}^{q6} \beta_{4i} \Delta POLCON_{t-i} + \\
 & + \delta_{71} CTE_{t-1} + \delta_{81} IE_{t-1} + \delta_{91} TE_{t-1} + \delta_{13} TI_{t-1} + \\
 & + \delta_{33} TO_{t-1} + \delta_{43} CAO_{t-1} + \delta_{52} POLCON_{t-1} + \epsilon_{3t}
 \end{aligned} \quad (9)$$

Model 4:

$$\begin{aligned} \Delta GHP_t = & a_{04} + \sum_{i=0}^p \beta_{1i} \Delta ITI_{t-i} + \\ & + \sum_{i=0}^{q1} \beta_{2i} \Delta DTI_{t-i} + \sum_{i=0}^{q2} \beta_{3i} \Delta cCAO_{t-i} + \\ & + \sum_{i=0}^{q3} \beta_{4i} \Delta POP_{t-i} + \delta_{101} ITI_{t-1} + \quad (10) \\ & + \delta_{201} DTI_{t-1} + \delta_{44} CAO_{t-1} + \delta_{301} POP_{t-1} + \epsilon_{4t} \end{aligned}$$

Model 5:

$$\begin{aligned} \Delta GHP_t = & a_{05} + \sum_{i=0}^p \beta_{1i} \Delta FB_{t-i} + \\ & + \sum_{i=0}^{q1} \beta_{2i} \Delta CAO_{t-i} + \sum_{i=0}^{q2} \beta_{3i} \Delta TO_{t-i} + \quad (11) \\ & + \sum_{i=0}^{q3} \beta_{4i} \Delta IND_{t-i} + \sum_{i=0}^{q4} \beta_{5i} \Delta POLCON_{t-i} + \\ & + \delta_{401} FB_{t-1} + \delta_{45} CAO_{t-1} + \delta_{34} TO_{t-1} + \\ & + \delta_{501} IND_{t-1} + \delta_{53} POLCON_{t-1} + \epsilon_{5t} \end{aligned}$$

ΔGHP_t in the above models is the output gap variable in the literature review. This variable is included in the model as a dependent variable. β terms are long-term coefficients and δ are short-term coefficients. In addition, p and q give the optimal lag lengths in the ARDL model. Δ denotes the first difference and ϵ denotes the error terms.

Third, after testing the models, the bound test was performed. Here, with the F statistical value, Pesaran et al. [52]. The table developed by is compared with the critical value. Then, the null hypothesis of the F test that the null hypothesis variables were not in a cointegration relationship was rejected, and it was concluded that there was a cointegration relationship.

Fourth, since the above Models 1-5 are cointegrated, their long-term relationships are estimated. This estimation refers to the equation with the β terms above but without the δ term, which represents the short term. In this case, the variable expressed by the term δ is expressed as $\lambda_{1...s} ECM_{t-1}$ for each model. The expression ECM_{t-1} in question indicates the error correction term, which should be negative and statistically significant [58, pp. 7-11; 59, pp. 141-142; 60, pp. 393-394].

Fifth, specification tests for the ARDL model were performed. According to Pesaran [50], stability testing for the predicted parameters of the ARDL

model is necessary to avoid the mis determination of the functional form due to fluctuations in the time variable. To test the parameter stability in the model, cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) values were examined. In these tests, when the statistical value is between the confidence intervals (5%), it is understood that the estimated coefficients are stable. However, the Ramsey Reset test, autocorrelation test (Breusch-Godfrey Serial Correlation LM Test), heteroscedasticity test (Breusch-Pagan-Godfrey), and normality test (Jarque-Bera) were used to test the presence of technical error in the model.

4. Research Results

Table 2 shows the results of the descriptive summary statistical analysis of the variables in the study. The result shows that the GDP output volatility for Turkey in the 1975-2020 period varies between 4.780 and 9.577, with an average value of 5.349 and a standard deviation of 3.119. Summary statistics of other variables are shown in Table 2.

Whether the stability condition of the parameter estimation in the analysis is met or not is shown in Figure 1 with the CUSUM and CUSUMQ tests. Table 2 and Figure 1 are considered together, the selected model is statistically stable and the parameters corresponding to all variables in the model are reliable.

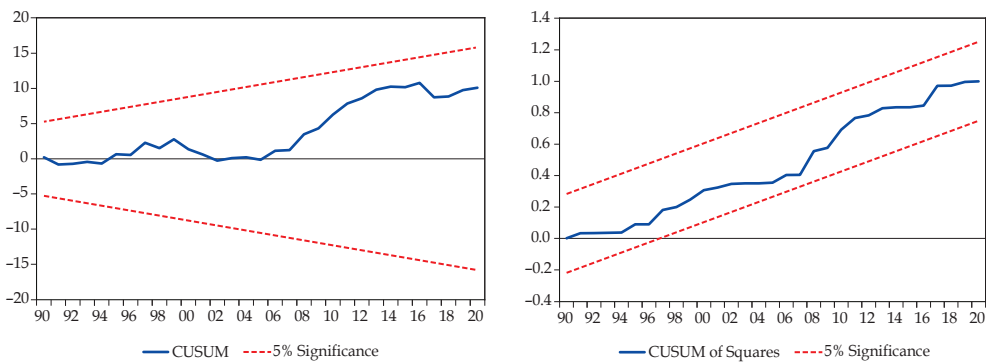
The time series of the variables in the study were examined using the ADF and PP unit root tests, which are frequently used in the literature. According to the stationarity test results shown in Table 3, the GHP, TO and POP variables are stationary at the level, while the other variables are stationary at the first difference.

The existence of a cointegration relationship between the variables in the models established within the scope of the study is determined by the F-bounds test. The fact that the F-statistics values specified in Table 4 are greater than the critical values of 5% and 10% indicates that there is a cointegration relationship between the variables.

Table 2

Descriptive Statistics												
	Mean	Median	Max.	Min.	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.	Sum	Sum Sq. Dev.	Obs.
GHP	4.78	5.34	9.57	0.10	3.11	-0.06	1.49	4.39	0.11	219.88	437.78	
TO	39.86	43.29	62.61	9.09	14.08	-0.51	2.41	2.71	0.25	1833.95	8925.59	
CAO	-0.87	-1.22	-0.02	-1.92	0.65	0.16	1.66	3.61	0.16	-40.35	19.35	
TI	13.17	12.39	18.01	7.83	3.68	-0.04	1.29	5.56	0.06	606.25	610.69	
GEII	9.11	11.04	21.70	2.32	6.13	0.28	1.60	4.34	0.11	419.47	1694.86	
GEEI	20.24	14.97	35.55	9.01	9.22	0.26	1.41	5.35	0.06	931.11	3828.30	
CTE	7.68	7.52	17.74	4.33	2.73	2.23	8.68	100.28	0.00	353.31	335.92	
TE	10.54	10.93	22.80	3.46	5.33	0.46	2.19	2.86	0.23	485.14	1281.40	46
IE	1.99	2.09	3.76	0.85	0.65	0.52	3.01	2.11	0.34	91.66	19.29	
DTI	5.02	4.77	6.85	3.66	0.762	0.558	2.336	3.233	0.198	231.15	26.12	
ITI	5.87	5.00	10.45	2.02	3.02	0.12	1.24	6.00	0.04	270.13	412.09	
FB	-2.84	-2.22	6.05	-12.15	3.30	-0.60	4.74	8.65	0.01	-131.09	492.38	
IND	6.78	8.00	9.00	0.00	3.03	-1.39	3.40	15.24	0.00	312.00	413.82	
POLCON	0.37	0.39	0.53	0.00	0.13	-1.70	5.86	38.06	0.00	17.12	0.79	
POP	7.77	7.78	7.93	7.59	0.09	-0.23	1.97	2.44	0.29	357.65	0.42	

Model 1



Model 2

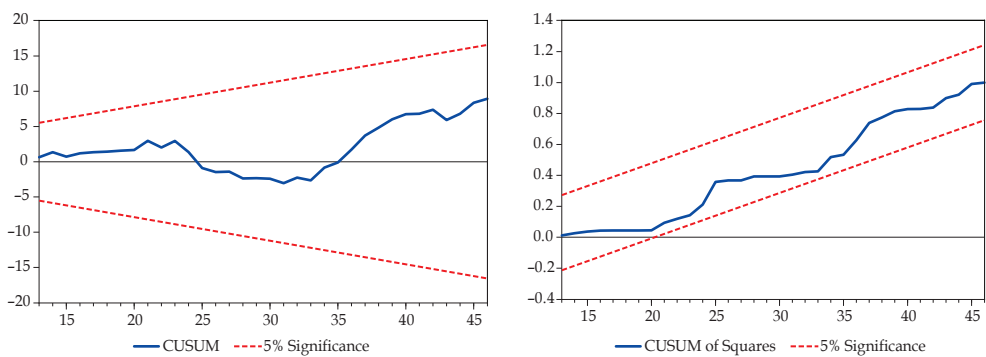
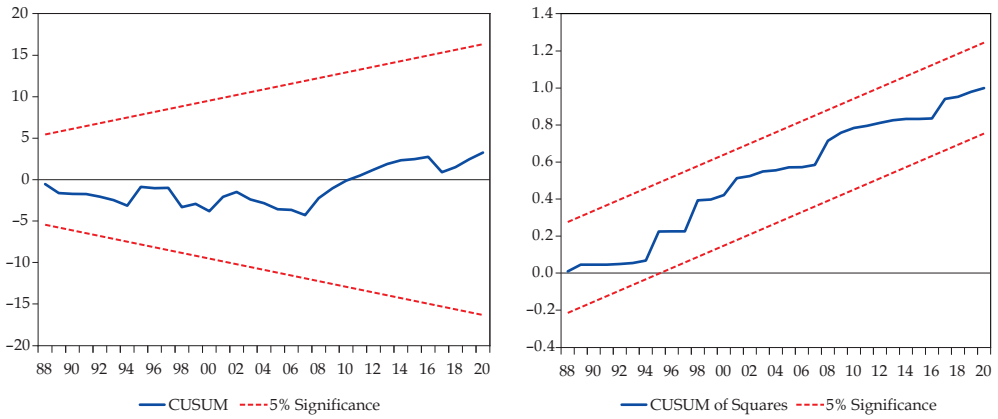
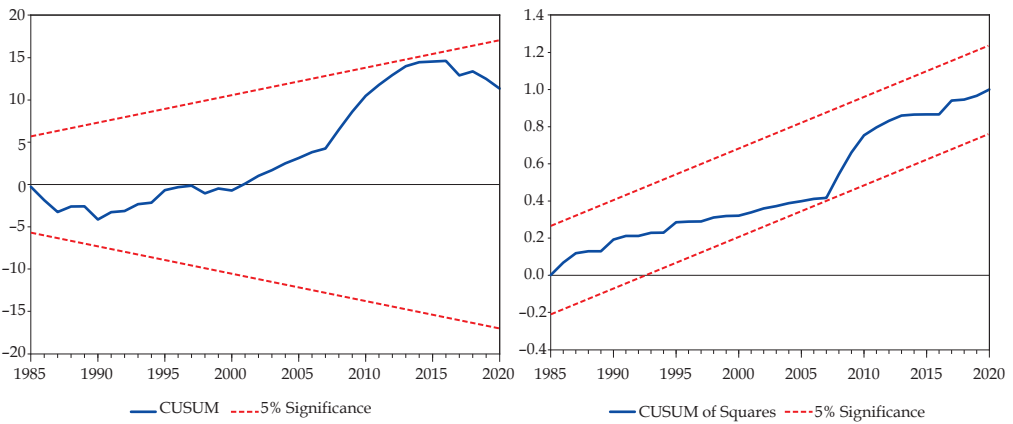


Figure 1. CUSUM and CUSUMQ Graphs

Model 3



Model 4



Model 5

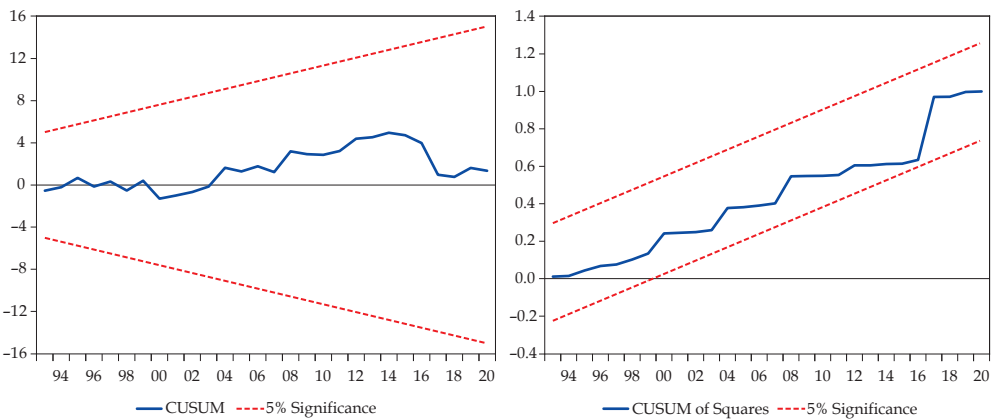


Figure 1. CUSUM and CUSUMQ Graphs (end)

In Table 4, the long-term coefficients of the variables are shown in Table 5 after the cointegration relationship between the series was determined. The table also includes the specification tests of ARDL models.

According to the result of *Model 1*, a 1% increase in GEEI increases GHP by 0.256%. However, if the TO variable increases by 1%, GHP is affected by -0.163%. In *Model 2*, a 1% increase in the GDP (TI) ratio of total tax revenues affects GHP by 0.891% and a 1% increase in TO

affects by 0.146%. On the other hand, in *Model 3*, a 1% increase in the TI variable affects the GHP by 0.858%, a 1% increase in IE affects the GHP by 1.240%, and TE by -0.421%. In *Model 4*, however, a 1% increase in FB affects the GHP by 0.639%. Finally, in *Model 5*, TO affects the output gap by -0.577%, while ITI affects -5.645% and DTI by 3.068%.

As a result of the analysis, the variables of CAO, GEII, CTE, IND, and POLCON were statistically insignificant. Although these variables influence cyclical

Table 3

Variables	Unit Root Tests			
	Level		First difference	
	ADF	PP	ADF	PP
GHP	0.000*	0.257	0.000*	0.159
TO	0.049**	0.181	0.000*	0.000*
CAO	0.619	0.522	0.000*	0.000*
TI	0.835	0.755	0.000*	0.000*
GEII	0.259	0.252	0.000*	0.000*
GEEI	0.594	0.631	0.000*	0.000*
CTE	0.968	0.968	0.000*	0.000*
IE	0.566	0.681	0.000*	0.000*
DTI	0.380	0.233	0.000*	0.000*
ITI	0.550	0.492	0.082***	0.000*
TE	0.806	0.619	0.000*	0.000*
FB	0.922	0.917	0.000*	0.000*
INA	0.194	0.265	0.000*	0.000*
POLCON	0.266	0.207	0.000*	0.000*
POP	0.025**	0.988	0.022**	0.558

Akaike Information Criteria is used as a basis for the choice of lag values of the variables in the table. Statistically, 1%, 5% and 10% significance levels are shown as *, **, ***, respectively. The values reported in the table are probability values.

Table 4

F-Limit Tests						
Model	k	F-stat.	%5 critical value		%10 critical value	
			I(0) lower bound	I(1) upper bound	I(0) lower bound	I(1) upper bound
1	5	6.886	2.62	3.79	2.26	3.35
2	4	5.450	2.86	4.01	2.45	3.52
3	7	7.395	2.32	3.50	2.03	3.13
4	5	3.436*	2.62	3.79	2.26	3.35
5	4	4.376	2.86	4.01	2.45	3.52

* Statistically significant at 10% critical value.

fluctuations, it is likely to be insignificant due to model specification error.

The value of the error correction coefficient indicated by $\text{CointEq}(-1)^*$ in Table 5 should be between 0 and -1 and be statistically significant. The ECM model indicates the time for the deviation to occur in the long-term equilibrium to reach equilibrium [61, p. 342].

Accordingly, within the scope of *Model 1* and *Model 2*, the balance is 1.3. It has been found that the equilibrium will be reached again in 1 year in the *Model 3*, 1.9 in the *Model 4*, and finally 2.9 years in the *Model 5*. According to the results of the diagnostic tests in Table 5, it was concluded that there was no specification problem in the models.

Table 5

Long- and Short-Term Coefficient Findings					
Model	(I)	(II)	(III)	(IV)	(v)
Dependent variable: GHP	(2,2,0,1,2,0)	(2,2,0,1,0)	(1,1,0,0,0,1,0,1)	(1,0,0,1,0,0)	(3,0,3,1,3)
TO	-0.163 (0.002)*	-0.146 (0.006)*	-0.039 (0.392)	-0.032 (0.647)	-0.577 (0.009)*
CAO	0.437 (0.504)	0.289 (0.678)	0.151 (0.835)	-0.490 (0.738)	-1.864 (0.393)
TI	0.251 (0.462)	0.891 (0.000)*	0.858 (0.000)*		
GEEI	0.256 (0.061)***				
GEII		0.124 (0.300)			
CTE			0.210 (0.231)		
IE			1.240 (0.091)***		
TE			-0.421 (0.008)*		
ITI					3.068 (0.004)*
DTI					-5.645 (0.059)***
FB				0.639 (0.034)**	
IND				0.047 (0.888)	
POLCON	8.165 (0.128)		1.170 (0.719)	7.299 (0.313)	
Panel B					
Observation	44	44	45	45	42
Adj. R ²	0.73	0.67	0.77	0.43	0.74
$\text{CointEq}(-1)^*$	-0.75 (0.00)	-0.74 (0.00)	-0.95 (0.00)	-0.52 (0.00)	-0.34 (0.00)
Panel C					
Breusch-Godfrey LM Test	0.53	0.31	0.55	0.26	0.14
Breusch-Pagan-Godfrey	0.72	0.39	0.21	0.77	0.90
Ramsey Reset Test	0.46	0.92	0.53	0.79	0.71
Jarque-Bera	0.32	0.51	0.79	0.08	0.48

Statistically, 1%, 5% and 10% significance levels are shown as *, **, ***, respectively. In Panel A, coefficients outside the parenthesis; The contents of the parenthesis are the probabilities. In Panel B, in the expression $\text{CointEq}(-1)^*$, except the parentheses are the coefficients; The ones in parentheses are the probabilities. Values reported in Panel C are probability values.

5. Discussion

The results of the research on the fiscal policy in Turkey from 1975 to 2020 and the analyzed sample of 13 variables affecting it show that the *H1* and *H2* hypotheses are confirmed. In other words, while voluntary fiscal policies are pro-cyclical, the automatic stabilizer creates a counter-cyclical effect. In *Model 1*, the GEEI variable proved to have a positive effect on GHP ($p < 0.10$), while in *Model 2*, TI proved to have a statistically significant effect on GHP ($p < 0.01$). In *Model 3*, investment ($p < 0.10$) and transfer ($p < 0.01$) expenditures from voluntary fiscal policies, budget balance ($p < 0.05$) in *Model 4*, indirect ($p < 0.10$) and direct ($p < 0.01$) in *Model 5* ($p < 0.01$) tax revenues proved to be significant. Therefore, among the three hypotheses tested in this study, it has been determined that *H1* is valid for indirect tax revenues, public expenditures, and balanced budget, and *H2* is confirmed for transfer and investment expenditures and direct tax revenues.

Testing the hypotheses in the study includes: (i) Unit root tests test for stationarity within a time series. A time series is stationary if a shift in time does not cause a change in the shape of the distribution. A unit root is a stochastic trend in a time series. The presence of unit roots can cause serious problems in your analysis, such as spurious regression. (ii) F-Test is any test that uses the F-distribution. The F-value is a value in the F distribution. Various statistical tests generate an F-value. The value can be used to determine whether the test is statistically significant. (iii) ARDL bounds test is a linear approach to examine the long- and short-term effects between variables and, more importantly, to test whether there is cointegration between variables.

The models are constructed according to different fiscal policy instruments in the open economy (TO and CAO). In *Model 1*, tax revenues and non-interest public expenditure, and in *Model 2*, public expenditure including interest are analyzed. In *Model 3*, while tax revenues are given, the components of public expenditures are tested. The budget balance in *Model 4* and tax revenue components (indirect/direct) in *Model 5* is examined. Thus, it was aimed

to see the effect of the variables clearly and clearly on the GHP.

Hypothesis testing should contribute to a better understanding of policy structure and provide a basis for institutional reform of fiscal policy. However, assumptions in theory (*ceteris paribus*) do not exist and therefore it is not easy to establish a deterministic relationship. The fiscal policies of another country create unexpected effects not only at the national level but also at the global level.

After 1980, Turkey completely switched to an open market economy (24 January Decisions). The cyclical fluctuations that emerged after these years mostly emerged due to integration into global markets and were replaced by crises in the following years. The measures taken against the crises often led to populist fiscal policies. With the Transition to a Strong Economy Program implemented under the leadership of the IMF in 2001, comprehensive measures were taken, and many structural problems were solved.

However, the institutional structure in Turkey could not reach the targeted quality and it was directly affected by the global crises due to political constraints. After the reform movements in 2001, public finance (Law No. 5018) became quite strong and became an active policy tool in the fight against crises. For this reason, most fiscal policy tools are used against cyclical fluctuations. This time, however, the problem of inflation arose.

Fiscal policies implemented between 2001–2015 did not have an inflationary effect. The most important reason for this is the financial investments coming to Turkey from sovereign wealth funds. This, in turn, led to a decrease in the exchange rate, which is one of the most important determinants of inflation, and to significant economic growth.

However, due to the decrease in short-term speculative capital movements from wealth funds and the interest policies applied (*neo-fisher*), inflation (about 90%) has increased today. Monetary and fiscal policies followed in such a conjuncture are mostly pro-cyclical. In the Medium-Term Plan published in September 2022, it is estimated that

the budget deficit will triple in 2023–2025. Considering the COVID-19 and immigration problems, Turkey's fiscal policy-oriented policy should be an expected result.

There are subjective and objective reasons for this. For subjective reasons, institutional problems can be expressed as the increase in unemployment during the pandemic period, the closure of companies, the increase in social security expenditures of immigrants, and the inability to abandon the inflationary growth policy. For objective reasons, the decrease in exports, especially during the pandemic period, followed by the increase in interest rates by the USA, the decrease in foreign exchange reserves, and global instability necessitate fiscal policies. Therefore, the fiscal policy variables used in the study did not show a homogeneous feature.

This situation can be explained by the insufficient capital accumulation in Turkey and the fact that the private sector is still in the development stage. On the other hand, while the effect of investment expenditures on the components of public expenditures supported the crowding-out finding, the transfer expenditures coefficient was negative. Accordingly, unrequited transfer of the public sector, such as health expenditures in Turkey, increases the total demand by increasing public expenditures and ultimately has a reducing effect on fluctuation (auto-stabilizer). When the effect of public revenues on cyclical fluctuations is examined, it has been determined that direct tax revenues have a reducing effect. Accordingly, while taxes on income reduce fluctuations, taxes on consumption increase fluctuations. On the other hand, the increase in the budget balance in the GDP ratio has an increasing effect on the fluctuations. It can be said that the fluctuations will move away from the balance because the fiscal policies followed by the balanced budget principle are financed by indirect taxes.

6. Conclusion

The main purpose of this article was to make some comments on the fiscal policy in Turkey.

The empirical results obtained from this study show that transfer and invest-

ment expenditures and direct tax revenues act as automatic stabilizers against economic fluctuations in Turkey. It reveals that indirect tax revenues, public expenditures, and budget balance move together with the conjuncture.

Turkey has been trying to rapidly integrate into global markets since the 1980s. For this reason, panel data analyzes are also included in the study besides time series analysis. The results of the analyzes made for OECD, developing and EMs countries also include Turkey. The findings of the study are in parallel with many studies. These studies emphasize that especially government expenditures in developing economies move with the conjuncture. In addition, studies suggesting that public revenues and expenditures will create a crowding-in effect instead of a crowding-out effect in the economy have suggested that this is happening in underdeveloped countries.

Policymakers in Turkey cannot fight cyclical fluctuations using only fiscal policies. Especially in an economy where inflation is high, tax reforms should be designed to ensure vertical and horizontal justice of the tax. In this case, the effect of inflation on the real tax burden will also decrease, but there has not been an inflation adjustment for the tax tariff in Turkey yet. The increase in the tax burden with inflation will cause a contraction in the economy as it reduces disposable income, and thus, while the injustice in income distribution increases, the cyclical fluctuation will become more severe.

Therefore, to improve growth performance by reducing volatility, it is necessary to introduce fiscal rules that limit the use of the cyclical policy. Studies in the literature advocate the introduction of fiscal rules against fluctuations in economies with high populist tendencies and fluctuations and argue that fiscal rules are an important factor in reducing fluctuations.

Of the three hypotheses tested in this study, it has been determined that *H1* is valid for indirect tax revenues, public expenditures, and balanced budget, and *H2* is confirmed for transfer and investment expenditures and direct tax revenues.

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Influence of Corporate Income Tax to Loan Loss Provision: Evidence from Uzbekistan

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ABSTRACT

This article is devoted to the analysis of the impact of corporate income tax on compulsory reserves created by commercial banks for possible loan loss provision. In the majority of countries banks are required to create compulsory reserves for potential loan loss provisions, and the corporate tax regime applies tax deductions to these compulsory reserves. The corporate tax system facilitates timely coverage of potential loan loss provision. In addition, corporate taxation is an essential factor in the transparency of banks' financial statements. The research has revealed that reserves for potential loan loss provision are used primarily for profit regulator purposes, not to regulate capital. This implies that when deducting the amount of total reserves for tax purposes of banks the loan loss provision is positively related to the corporate income tax rate. The analysis of the selected commercial banks has confirmed that the impact of corporate income tax is more significant for the timely admitting potential loan loss provision when deducting general reserves from the tax base, mainly for the purpose of taxing banks' profits. According to the results, an increase in the tax rate by an average of 1% could lead to an increase in the amount of required loan loss provision by 3.9%. This means that when total reserves are deducted for tax purposes, the underlying hypotheses that compulsory reserves for loan loss provisions are positively correlated with the corporate income tax rate and that the amount of loss reserves is increased at the income tax rate have been confirmed. In general, the following aspects are crucially important in the taxation of profits of commercial banks: which method is more convenient for loan loss provision (write-offs or formation of reserves); entire or partial compliance between the taxation and regulation of reserves for loan loss provision; imposing restrictions on the application of tax deductions to reserves for possible loan loss provisions.

KEYWORDS

bank, loan, tax, loan loss provisioning, tax rate, corporate income tax, tax deduction

JEL G 21, G 28, H 20, H 21, H 30

УДК 336.2

Влияние налога на прибыль на резерв по кредитным убыткам: доказательства из Узбекистана

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АННОТАЦИЯ

Данная статья посвящена анализу влияния налога на прибыль организаций на обязательные резервы, создаваемые коммерческими банками на возможные потери по ссудам. В большинстве стран банки обязаны создавать обязательные резер-

вы на возможные потери по ссудам, а режим корпоративного налогообложения предусматривает налоговые вычеты из этих обязательных резервов. Кроме того, корпоративное налогообложение является важным фактором прозрачности финансовой отчетности банков. Исследование показало, что резервы на возможные потери по ссудам используются в основном в целях регулирования прибыли, а не капитала. Это означает, что при вычете суммы совокупных резервов для целей налогообложения банков резерв на возможные потери по ссудам положительно связан со ставкой налога на прибыль организаций. Анализ выбранных коммерческих банков подтвердил, что влияние налога на прибыль более существенно для своевременного признания резерва на возможные потери по ссудам при вычете общих резервов из налоговой базы, в основном для целей налогообложения прибыли банков. Согласно результатам, увеличение налоговой ставки в среднем на 1 % может привести к увеличению суммы необходимого резерва на возможные потери по ссудам на 3,9 %. Это означает, что, когда общая сумма резервов вычитается для целей налогообложения, основные гипотезы о том, что обязательные резервы на покрытие возможных потерь по ссудам положительно коррелируют со ставкой налога на прибыль, и что сумма резервов на возможные потери увеличивается по ставке налога на прибыль, были подтверждены.

КЛЮЧЕВЫЕ СЛОВА

банк, кредит, резервы на возможные потери по ссудам, налоговая ставка, налог на прибыль организаций, налоговый вычет

1. Introduction

In the period of post-global financial crisis of the world, the main attention of economists [1–3] is focused on evaluating the impact and negative consequences of the current corporate profit tax system on the stability of the financial sector.

In the conducted studies, most economists [3–6] focused on the negative impact of corporate taxation on the activity of commercial banks. In particular, in a number of studies, the preferential status of debt financing in the corporate tax system, the incentive of commercial banks to excessive debt financing, and the impact of them as a result the occurrence of the financial crisis have been studied.

When determining the taxable tax base in commercial banks, the amount of loan loss provisioning is included in the deductible expenses. According to economists, the loan loss provisioning is based on the damage model and increases during crises, but this type of taxation in favor of banks it has been found that the approach leads to non-transparent management of the formed reserve for losses and income smoothing.

In particular, Laeven & Majnoni [7] noted, banks appear to have increased the amount of provisions during periods of positive profits but at the same time they

have been less prudent during periods of rapid credit growth. Reserves increase during periods when earnings are higher, suggesting earnings smoothing [8]. Bank income smoothing with loan loss provisions varies across countries depending on institutions, regulation, supervision, financial structure, and financial development [9]. Banks exploited provisioning discretion to boost earnings [10]. If banks provision more in times when earnings are higher, then we would expect a positive relation between earnings before provisions and taxes (EBPT) and loan-loss provisions. The banks accumulate additional provisions when their earnings are higher [11].

In this research paper, we investigate whether changes in the corporate profit tax rate affect the amount of reserves formed for possible loan losses. In particular, the impact of the tax rate on the formation of provisions for loan losses is evaluated. Banking regulators and policymakers say that the deduction of provisions for possible loan losses from the tax base, in turn, ensures timely recognition of loan losses.

On the other hand, Basel's regulatory capital requirements under Pillar I are designed to cover unexpected losses because expected losses have been recognized by loan loss provisioning and hence deducted from bank capital [12].

The value of the tax credit depends on the profit tax rate, after the total deduction of general reserves formed for possible losses on loans in the taxation of banks' profits. As a result of deducting general reserves formed for possible losses on loans, higher provisions can be costly to bank managers if regulatory scrutiny increases as a result of lower capital ratios, or if compensation decreases as a result of lower earnings [13].

Thus, it is an empirical matter to determine whether the corporate profit tax rate has an economic effect on the formation of these reserves when the general provisions formed for possible loan losses in the corporate profit tax system are deducted. There are also mechanisms by which the corporate profit tax system may affect the formation of provisions for possible loan losses. First, the system could encourage banks to recognize loan portfolio deteriorations in the provision in a timelier manner. This is often referred to as timely loan loss recognition. Alternatively, the corporate tax system could encourage greater loan risk-taking if banks anticipate the tax deduction benefits generated by provisions when deciding on the riskiness of their loan portfolio.

These mechanisms have very different regulatory implications: prior research [14] associates the former with greater transparency because it provides timely signals of bank health and risk-taking to regulators and creditors, whereas the latter suggests that taxation could have a potentially destabilizing effect on the banking sector [15].

The purpose of our research is to show that in the current system of taxation of profits of commercial banks, the volume of reserves for possible losses on loans depends on the tax rate and that banks use reserves mainly as a regulator of taxable profits. In the conducted research, it is assumed that loan loss provisions are more sensitive to the corporate income tax rate.

The main hypothesis that loan loss provisions are positively related to the corporate income tax rate when the total amount of provisions is deducted for tax purposes.

Article structure. Section 2 of the article provides an overview of theoretical

and empirical literature within the scope of the research topic, section 3 describes the research methodology and methods used, section 4 assesses the impact of the corporate income tax rate on the formation of reserves for possible loan losses and discusses the results of the analysis, appropriate conclusions and suggestions are made in the section 5.

2. Literature review

The first part of this section provides a review of the scientific literature sources on the promotion of timely admitting of losses on loans in the corporate tax system, which contributes to the transparency of banks and creation of reserves. The next part of this section provides an overview of the empirical literature on assessing the impact of corporate taxation on loan loss provisions.

2.1. Theoretical literature review

Provision for bad debt or loan loss provision, is a deduction from bank net interest income to cover expected credit losses on bank loan portfolio. Bank regulators continue to stress that loan loss provision should be sufficient to minimize loan loss on bank loan portfolio. However, emerging empirical studies suggests that bank managers may have other incentive(s) to influence or manipulate reported loan loss provision estimates other than mitigating expected credit loss [16].

The primary financial accounting expense for a bank is the loan loss provision [17]. Loan loss provisions account for more than half of banks' total accruals and explain a very large fraction of the variation in total accruals [18]. When banks create loans, there is an expectation that some portion of them will go bad, resulting in losses for the bank.

Therefore, banks recognize a provision at loan initiation equal to the expected loss on the loans. For certain types of loans, such as mortgage and consumer, banks will recognize a general loan loss provision. The assumption underlying the general provision is that some loans in the portfolio may already have incurred losses, although they have yet to be spe-

cifically identified. For other loan types, such as corporate loans, the provision is based on the economics of that particular loan and is referred to as a specific loan loss provision [13].

A bank weighs the benefits and costs when determining the current period's loan loss provision. The benefits of increasing the current period provision for expected losses come primarily from having a higher loan loss reserve and thus being better able to absorb expected future losses. Regulators prefer banks to have higher loan loss provisions and loan loss reserves for this very reason [19].

The drawbacks of increasing the loan loss provision in anticipation of future losses include lower current earnings, which could affect the stock price and executive compensation [20], and lower capital ratios, which could attract the scrutiny of bank regulators, especially for banks that are already poorly capitalized [21].

In particular, they noted that the application of large-scale tax incentives to debt financing would lead to significantly higher bank lending and that this was more likely to be related to the likelihood of a crisis. In addition, the reduction of tax discrimination between debt financing and capital financing will cause an increase in the level of capitalization of financial institutions. In the opinion of Schepens [6], the ratio of debt to private capital is related to the growth of bank capital ratios and the growth of total capital.

In recent years, legislative bodies and regulatory authorities have considered the possibility of enhancing tax deductions on reserves for loan loss provisions. This is since tax deductions ensure that losses are reflected in the relevant reporting period. However, insufficient number of empirical studies have been conducted to assess the impact of the corporate income tax system on loss reserves. It is vitally important that tax incentives affect the formation of reserves for loan loss reserves because loss reserves are the most significant in the discretionary choice of financial reporting for banks [17]. Research on the banks' financial statements focuses on the financial reporting and risk assess-

ment of banks, their relationship to regulatory capital and profit management, and the study of economic decisions of banks under different accounting regimes [18].

De Vincenzo & Ricotti [22] argue that the corporate tax system encourages timely admitting losses on loans, which contributes to the transparency of banks' balance sheets. As mentioned above, the amount of reserves for possible losses on loans is relatively high as a share of the bank's total expenses, and changes in the amount of reserves can lead to significant changes in the structure of bank expenses.

It is obvious that the reserves created to cover losses on bank loans perform as a cushion. Herewith, loan loss provisions are included in deductible expenses which causes a reduction in net profit and regulatory capital (due to a decrease in retained earnings).

In general, the corporate tax system encourages loan losses to be reflected in due time. Moreover, corporate taxation is an essential factor in the transparency of banks' financial statements. In most countries, banks are required to create loan loss provisions for financial reporting purposes, and the tax regime applies tax deductions to these reserves [20].

It is important to note that it is not obvious that tax incentives will have an economically important impact on loan loss provisioning. As mentioned earlier, higher loan loss provisions are costly to bank managers in several ways. First, lower capital ratios can attract regulatory scrutiny, which in turn can lead to negative outcomes for bank managers such as restrictions on lending behavior or bank closure [21].

2.2. Empiric literature review

Several previous studies have confirmed the use of loan loss reserves as an income regulator [23–26]. Also, because of further studies, it was determined that the provisions for possible losses on loans are used for income smoothing.

Anandarajan et al. [27] found that publicly traded banks in Australia engage in this practice of earnings management, while Perez et al. [28] analysis of bank

data from 1982–2002 confirmed the use of loan loss reserves as an earnings regulator by 142 banks in Spain [27; 28].

Leventis et al. [29] using a sample of 91 EU banks, found that income smoothing is more pronounced among risky banks, but this smoothing behavior is less aggressive after implementation of IFRS.

El Sood [30] found strong evidence for income smoothing in a study of US bank data.

Balbao et al. [31] analysis using data from 9442 US banks from 1999 to 2008 suggests that banks use reserves to smooth earnings, but this relationship may depend on non-linear models. In general, because of most conducted empirical studies, it was determined that banks use reserves for possible losses on loans as a regulator of income.

The results of the research presented above can be cited as the reason for putting forward the hypothesis that there is a positive correlation between the amount of reserves formed for possible loan losses and the corporate profit tax. Of course, when the corporate tax system has tax deductions for general reserves formed against possible loan losses. This suggests that when the corporate profit tax rate is high (low), to minimize the volatility of earnings or to avoid regulatory inspections, commercial banks tend to increase (decrease) the total reserves formed for possible loan losses [19]

While in some countries banks are allowed to deduct general provisions for losses for tax purposes, in the tax system of other countries only discounts on reserves for certain impaired loans are allowed or there are no tax deductions at all [13]. High levels of reserves can create negative situations for bank managers. That is, an increase in the minimum demand for capital or a low return on income causes a decrease in profitability. In our opinion, the analysis of the economic impact of the corporate tax system on the formation of loan loss provisions constitutes an empirical issue.

In particular, Andries et al. [13] analyzed the impact of the corporate tax system on the financial statements of banks, considering losses on loans. The analysis

used the data on average interstate income tax rates for 2001–2013 and tax deductions for loan loss provisions. According to the results of the analysis, 1 percent increase in the corporate income tax rate in countries, where tax deductions for total reserves for loan loss provisions applied, would result in an average increase in reserves of 4.9 percent.

Moreover, the delay in determining the expected loss will cause an increase in the following 3 different levels of risk associated with banking activities: a decrease in the balance sheet of certain banks, a decrease in systemic risk sensitivity and an increased risk of shrinking the overall banking sector [14]. In addition, the delay in determining the amount of expected losses is associated with a high risk of leading to a significant reduction in the balance sheets of banks during periods of economic downturn. Furthermore, high probability of delay in determining the expected loss in banks can result to systemic risk.

Based on the study of US banks during the financial crisis of 2007–2009 made by Gallemore [15], there was a negative correlation between delay in admitting losses on loans and likelihood of intervention of regulatory authorities. The results of this study are justified by the fact that the delay in admitting losses on loans may affect the decision of the regulatory authorities. In addition, it has been demonstrated that the impact of the corporate taxation system on loan loss provisions varies from country to country.

First, it has been witnessed that in countries where the corporate income tax system has a great influence, regulators have relatively low oversight powers, and it has been noted that encouraging reserves for losses in the corporate tax system could replace banking regulators.

Second, it has been observed that in countries with high compliance of tax returns, the impact of the tax system on reserves is stronger. Finally, the impact of the tax system on the formation of loan loss provisions may have other consequences for commercial banks. For example, when studying the situation with the

US banks during 2001–2013, it is obvious that the increase in assets at most banks was estimated at 500 million USD due to restrictions on reserves. This justifies the fact that the corporate tax system can definitely impact the amount of bank assets to be within certain limits [15].

It is clear from the statements specified above, there is strong evidence that the amount of reserves will increase at the level of the income tax rate if the reserves on losses in the corporate tax system are not taxed. In addition, the study concludes that the impact of the corporate tax system, rather than the increase in risks, will be essential for timely admitting of losses on loans. Herewith, the corporate tax system can replace the regulatory rules for banks by encouraging banks to enhance reserves for loan loss provisions and admitting losses on loans in the corporate tax system in due time can result in the transparency of the banking system.

3. Research methodology

3.1. Representation of statistical data

In this research paper, we have used the statistics of “Ahbor-Reyting” rating agency on the banking sector in 2012–2018 and the financial statements of branches of “Qishloq Qurilish Bank” JSCB during 2013–2018.

In assessing the impact of the corporate profit tax on the reserves for possible losses on loans in banks, data on the reserves formed for possible losses on loans in the sector of banks for the years 2013–2018 were obtained from the head offices of “Qishloq Qurilish Bank” JSCB. Also, information on profit tax rates for 2013–2018 was obtained from the official website of the State Tax Committee.

In the formation of statistical data for empirical analysis, the amount of reserves for possible losses in 2016–2018, i.e. the total amount of reserves formed for possible losses on loans in the regional branches of the “Qishloq Qurilish Bank” JSCB as a dependent variable, and the effective rate of corporate profit tax established for commercial banks were taken as an independent variable.

3.2. Methods applied in the research

Theoretical and empirical methods were used in the study based on the purpose of assessing the impact of the corporate profit tax rate on the amount of reserves formed by banks for possible losses on loans. In commercial banks, the amount of reserves for possible losses on loans within the norms set by the Central Bank is included in the deductible expenses when determining the profit tax base, which leads to incentives for recognition of reserves by banks. Because commercial banks have more flexibility with respect to total reserves formed for possible loan losses, reserves may be sensitive to the impact of tax credits when tax deductions are applied to total reserves. On the other hand, setting restrictions on the application of tax deductions for possible loan loss reserves means that banks have to wait until it is clear that the loans will be impaired.

Based on this, it is worth noting that in the corporate profit tax system, the profit tax rate may not be the main determinant in the formation of reserves when there is a limit on the application of tax deductions to reserves for possible losses or a write-off method for losses on loans.

However, it has been determined that the amount of tax deductions for the total reserves for probable losses (if allowed) may increase due to the different corporate income tax rates in different countries. In particular, as a result of a number of empirical studies, when tax deductions are applied to the general reserves formed for possible credit losses, it was determined that the increase in the amount of the reserve is not related to the level of risks, but to the increase in the corporate profit tax rate [13].

Based on this, it was concluded that the amount of reserves for loan losses is directly related to the corporate profit tax rate when the total amount of reserves is deducted in the taxation of commercial banks' profits.

Theoretical methods were used to study whether the amount of reserves for loan losses in the corporate profit tax sys-

tem depends on the tax rate. Including, such methods as comparative analysis, monographic observations, and descriptive statistical methods have been widely used in the research.

To test our hypothesis, we panel data using a regression model, a regression analysis has been made to assess the impact of corporate income tax on reserves for possible loan loss provisions. The OLS method was used to estimate the impact of corporate income tax on loan loss reserves in banks, based on the variant of the loan loss reserves model proposed by Bushman & Williams [14]. Specifically, we use a panel data regression model with the following overview:

$$Y_{it} = \beta_0 + X_{it} + \varepsilon_{it}. \quad (1)$$

The unit of observation is the bank-year, with i indexing firms, c indexing countries, and t indexing years. The dependent variable LLP is the loan loss provision scaled by lagged total loans. The primary independent variable is the interaction between tax rate. Tax rate is the top statutory corporate income tax rate (demeaned when used in the regressions).

4. Analysis and results

4.1. Reserves and on loan losses and taxation

The share of interest-bearing income in the total revenue of commercial banks was relatively high (72.49%), and the main income derived from the interest on loans. The share of interest-free expenses of commercial banks was high (34.44%), which main part constituted of the share of salaries and other operating expenses (including taxes and compulsory payments) (Table 1). Meanwhile it is obvious that the share of reserves for loan losses in the structure of expenditures has increased significantly.

Although admitting reserves for loan loss provisions is required to ensure the transparency of banks' financial statements, the procedure for the formation of these reserves in the tax regime makes a great impact. According to the Tax Code¹, allocations to reserves for losses within the norms established by the Central Bank are included in the deductible expenses of commercial banks.

¹ Tax Code of the Republic of Uzbekistan 2019. National database of the legislative acts, December 31, 2019, No. 02/19/SK/4256.

Table 1

Composition of income and expenses of commercial banks (%)

	2015	2016	2017	2018	2019
Income composition					
Interest-bearing income	60.97	61.23	52.49	67.44	72.49
Fee-based income	27.49	27.97	22.78	16.94	12.56
Income from foreign exchange	5.20	4.24	18.58	9.15	5.91
Income from investments	0.71	0.82	0.78	0.54	0.53
Other income	5.63	5.73	5.38	5.93	8.51
Expenses composition					
Interest-bearing expenses	39.49	39.97	34.18	44.85	50.57
Interest-free expenses, total	50.50	49.36	49.51	41.30	34.44
Including, salary	24.10	23.60	19.39	19.59	15.82
Other operating expenses	20.65	17.20	13.61	13.72	8.27
Other expenses	10.01	10.67	16.31	13.85	14.98
Including, reserves on loan loss provisions	5.33	5.43	11.45	8.95	11.78
Income tax	3.74	4.13	2.80	3.75	3.21

Note. Compiled according to: Rating Agency «Ahbor-Reyting 2019». Analytical review of the banking sector of Uzbekistan 2014–2019.

Moreover, according to the court decision, unpaid debts due to termination of obligations, bankruptcy, liquidation or death of the debtor or expiration of the claim period are considered bad debts, and the amount to be written off from the provision for doubtful debts should be deducted from the bad debts. Taxpayers may deduct the amount of expenses on bad debts written off from taxable profit, but in periods after the current reporting period, they are deductible for a period determined by the taxpayer's accounting policy, but which does not exceed ten years.

In addition, the taxpayer has the right to redistribute the losses within five years after the tax period in which the loss occurred, and the total amount of losses distributed should not exceed 50% of the taxable profit calculated in the current tax period. Banks create a certain amount of reserves to cover the expected losses on the loan portfolio to reduce credit risk.

Of course, assessment of reserves for losses, which is used to mitigate losses on the loan portfolio of banks, constitutes a tool for credit risk management. Reserves for losses on bank loans have always been on the focus of the regulatory authorities and developers of accounting standards because reserves have become an integral part of bank capital regulation. The results of the analysis illustrate that the delay in the formation of reserves for non-performing loans in most banks throughout the world until the period of cyclical economic downturn leads to an increase in the impact of the economic cycle on bank income and capital.

Herewith, given the differences in the formation of reserves for loan losses in different countries, the problems associated with the use of different methods of covering loan losses cannot be achieved without a full solution, thus it is quite impossible to achieve the goal of the new Basel agreements [7].

Basel-I requires banks to have at least 8 percent of regulatory capital in relation to risky assets and to cover the following three types of market, credit and opera-

tional risks. According to Basel-I², the loan loss provision constitutes 1.25% of the risk assets of tier II capital, and each country can raise this limit to meet the requirements for regulation of the banking sector. If the expected losses are greater than the reserves, banks should deduct the difference from equity (50% from tier I and tier II capital). When the expected losses are less than the reserves, banks must admit the amount of the difference up to a maximum of 0.6% of the risk assets of tier II capital³.

The standardized approach requires banks to identify risk categories based on external credit ratings. The main aim of the introduction of Basel-II standards is to introduce a risk-sensitive methodology to determine the minimum capital required to cover losses, especially losses on loans, which is based on three components: minimum requirements for capital structure, control and market discipline. The main objection to the system of creating reserves for losses on loans under the requirements of Basel-II has been the fact that creation of compulsory reserves for losses is implemented once a year (at the beginning of the year or quarterly or semi-annually).

This implies that the level of provisions for loan losses in relation to a particular loan is determined from the outset based on a set of criteria specific to certain borrowers and banks. In Basel III, the system of reserves for loan loss provisions requires banks and financial institutions to create reserves for subsequent loans based on the individual characteristics of the borrower, which determines the efficiency of loans.

In particular, the formation of compulsory reserves for losses on loans by commercial banks in the country is implemented in reliance upon the Regulation on the classification of asset quality and

² BCBS 2001. Basel committee on banking supervision. The New Basel Capital Accord, consultative document. <http://www.bis.org>

³ BCBS 2004. Basel II: International convergence of capital measurement and capital standards: A revised framework. Basel Committee Publications. No. 107, June. <http://www.bis.org>

the formation of reserves to cover losses on assets, developed by the Central Bank⁴. This Regulation implies creation of compulsory reserves for losses on loans in commercial banks, classified as “standard”, “substandard”, “unsatisfactory”, “doubtful” and “bad” (non-performing).

In particular, for standard loans extended by commercial banks this figure constitutes one percent of the amount of their outstanding principal debt (residual); for substandard loans this figure accounts for 10% of their outstanding principal debt (residual); for unsatisfactory loans this figure constitutes 25% of their outstanding principal debt (residual); for doubtful loans this figure accounts for 50% of their outstanding principal debt (residual); and for bad (non-performing) loans this figure constitutes 100% and the banks are obliged to create special reserves in the amounts specified above. In addition, assets placed with banks overseas are classified as standard and substandard based on downgraded ratings by “Standard & Poor’s”, “Fitch Ratings” and “Moody’s Investors Service”, and if the principal and (or) interest on these assets are overdue, they are non-performing.

⁴ Regulation 2015. “On the classification of asset quality in commercial banks and the order of formation and use of reserves to cover possible loan loss provisions”, state registration No. 2696.

The amount of the principal in the bad debts is covered by the reserves created by commercial banks for possible losses on loans. Covered bad debts and interest thereto must be reflected in the balance sheet of “Unforeseen circumstances” accounts within five-year period upon the date of transfer to the accounts in off-balance sheet items. Both principal and interest that have not been repaid within five years after transfer to these accounts may be written off in compliance with the decision of the Board of Directors approved by the General Meeting of Shareholders. According to the tax legislation, in determining the taxable profit of credit agencies, compulsory reserves on substandard, unsatisfactory, doubtful and bad loans are included in deductible expenses.

The data illustrate that the difference between problem loans (“unsatisfactory”, “doubtful” and “bad”) and required reserves for loan losses was rather high (Figure 1).

In reliance upon the statements specified above it can be assumed, that banks will increase their expenditures at the expense of required reserves and reduce taxable profits. This is because the amount of required reserves for potential losses on loans to commercial banks is classified basically on the basis of factors such as doubt about financial position or collateral

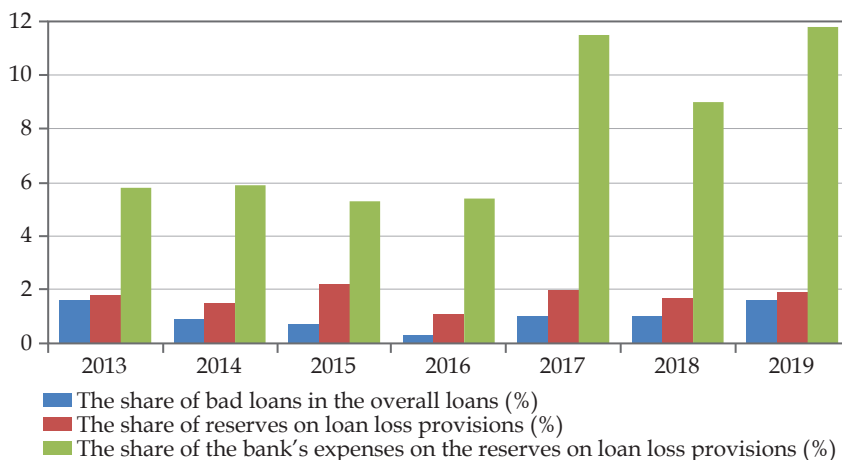


Figure 1. Compulsory reserves on loan loss provisions (in %)

Note. Compiled according to: Rating Agency “Ahbor-Reyting 2019”. Analytical review of the banking sector of Uzbekistan 2014–2019

oversight, insufficient information or collateral documents in the loan documents and delays in debt and interest payments. Furthermore, appropriate methods are not used in measuring the number of potential losses on assets (e.g., Value-at-Risk, VaR methodology).

In previous periods, the average amount of required reserves created for potential losses on risky operations of banks in the risky operations 4.6 times has exceeded the average amount of bad debts written-off (Figure 2).

For tax purposes, there is no single standard international practice for reserves for loan losses. In some countries, the write-off method is applied for loan losses, while in other countries the method of creating the reserves required for the regulatory accounting is used.

Taxation regimes of reserves on loan loss provisions vary greatly from country to country. For example, in Australia, Korea, Malaysia, and the Philippines, the write-off method is used, and only losses on bad loans are admitted in the corporate tax system. For tax purposes in the Philippines, bad debts are written off from the bank's accounting records and approved by the Central Bank. In several countries (Japan, Thailand) there are limits set for tax deductions for losses on loans. In particular, in Thailand, the amount of

reserves for losses on bank loans can be deducted from the tax base depending on which amount is less – either 25% of the amount of net profit or 0.25% of the total outstanding loans.

Herewith, the tax legislation stipulates those losses on loans can be written off only in cases where a civil case has been filed against the debtor or he has been declared bankrupt or died. Taxation of commercial banks in the United States is based on the general rules of corporate taxation, considering the exceptions provided for in the Internal Revenue Code adopted in 1986. A taxable base should be reduced by the amount of expenses on bad debts that were partially or completely depreciated during the reporting period. However, banks are imposed a limit for reserves to cover losses on bad loans. If assets of these banks constitute the amount of up to 500 million USD, then tax deductions on reserves for loan losses are allowed. The total amount of these reserves is determined by multiplying the amount of all loans of the bank by the amount of empirically determined losses (average for the past 6 years). The number of reserves for loan losses in Russian banks is set as follows: from 1 percent up to 20% for non-standard loans; from 21% up to 50% for doubtful loans; from 51% up to percent for problem loans; 100% for bad loans.

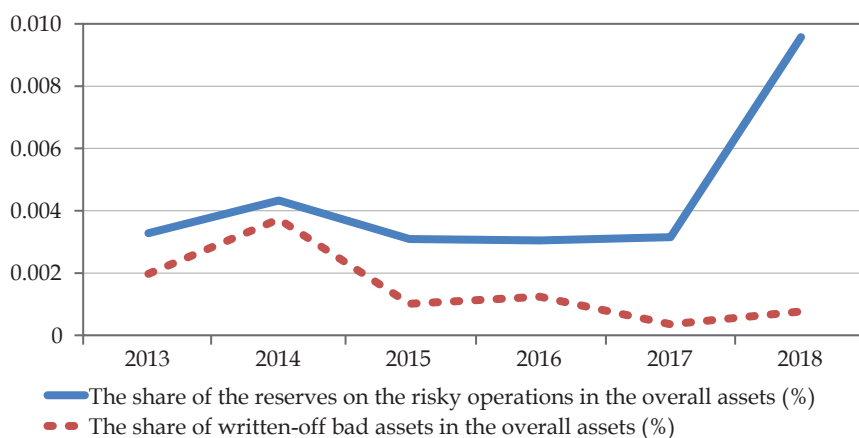


Figure 2. The share of the reserves on the risky operations and written-off bad assets in the overall assets, the period between 2013 and 2018

Note. Compiled according to: Report 2018. Statistical data of "Agrobank" JSCB and "Qishloq Qurilish Bank" JSCB for 2013–2018

However, there are opinions in the tax authorities that the banks are increasing the amount of reserves and that a certain part of the expenses is not economically justified. This means that the determination of the income tax base by the bank can make a significant impact on the outcome of the classification of loans into one or another category. This is because these expenses are subject to deduction from the income tax base in compliance with Article 315, paragraph 2 of the Tax Code. It should be noted, that tier II capital structure of banks includes reserves created on standard loans (assets) in the amount of not more than 1.25 percent of the amount of net assets, taking into account the risk for the current year, mixed liabilities (equity and debt capital), including preference shares, subordinate debt not exceeding one-third of tier I capital and the amount exceeding 45 percent of the appraised value of the initial value of assets.

In general, providing the banks with the opportunity to deduct tax on reserves for risky operations within the established norms, encouraging the recognition of reserves enable bank managers to operate more freely than total reserves for loan losses. Application of tax deductions to total reserves, in turn, can make reserves more sensitive to the effects of tax incentives. On the other hand, application of tax deductions only to certain reserves for loan losses implies that banks must wait until the depreciation of loans is precisely determined.

It should be noted that tax incentives for the formation of loss reserves demonstrate the following economically significant effects. First, it can have

negative consequences, such as having a minimum capital adequacy ratio, attracting particular attention of regulators, suspending banking activities for managers, or restricting lending activities. Second, reserves for loan losses can negatively affect the amount of dividends payable by reducing the balance sheet profit, causing a fall in stock prices.

4.2. Impact of corporate income tax on loan loss provisions

For tax purposes, when deducting compulsory reserves for potential losses on loans, to verify the basic hypothesis that reserves are positively related to the corporate income tax rate, we evaluate the following regression using the OLS method in reliance upon the reserve model for loan losses proposed by Bushman and Williams [14]:

$$LLP_{it} = \beta_0 + \beta_1 TAX RATE_{c,t} + \varepsilon_{i,t}. \quad (2)$$

In our analysis of 42 branches of “Qishloq Qurilish Bank” in the period of 2016–2018 (i) (Y) is dependent variable which illustrates the amount of compulsory reserves on loan loss provisions (LLP) within the period of time (t) and the average income tax rate (TAX RATE) (X) determined as a free variable based on the share of interest income on loans in relation to the total income of the bank.

As a result of the regression analysis, the statistical significance of the effect of the income tax rate on the compulsory reserves for loan loss provisions has been found to be high (Table 2).

According to the results, an increase in the tax rate by an average of 1% could lead to an increase in the amount of required

Table 2

Results of the regression analysis		
	Lnlip Random effects	Lnlip Fixed effects
Lntaxrate	3.873*** (0.574)	3.932*** (0.582)
_cons	-5.337*** (1.546)	-5.476*** (1.557)
N	109	109
R ²	0.41	0.41

Note. Standard errors in parentheses; ***p < 0.01, **p < 0.05, *p < 0.1

reserves for loan loss provisions by 3.9% (which is about 9.4 million UZS). This implies that when deducting total reserves for tax purposes, the main hypotheses about the positive correlation of the compulsory reserves on loan loss provisions with the corporate income tax rate and the increase in the amount reserves on loss at the income tax rate have been confirmed.

In addition, loan loss provisions can lead to a loss of attractiveness of bank shares as a result of a reduction in the balance sheet profit of banks through compulsory reserves.

5. Discussion

According to Sunley [32], the tax treatment of bank loan losses is a controversial issue in a number of developing countries and countries with economies in transition. In order to ensure that banks do not reduce their provisions for probable loan losses and are incentivized by the current tax relief on loan loss provisions, banks and banking regulators generally want the recognition of loan losses to be closely linked to the accounting of tax regulations.

Tax authorities are often cautious about the regulations, and its adoption for taxation purposes leads to a significant reduction in the profit tax paid by banks [33]. According to Bassett & Zakrajšek [34], considering the importance of loans in bank assets and the value of bad debts, accounting for loan losses is a key issue of tax policy related to the taxation of banking activities. For example, in 2000, in the US, loans and leases accounted for 60% of bank assets, and loan loss reserves accounted for 21% of pre-tax profits.

Loan losses are unavoidable costs for banks to make a profit [35], and these losses must be recognized as expenses for financial and tax purposes [36]. More generally, banks can smooth their earnings by drawing from loan loss reserves if actual losses exceed expected losses and by contributing additional loan loss provisions to loan loss reserves if actual losses are lower than expected losses [7].

High tax rate countries that allow general provision deductibility, current provisions map strongly into future net

charge-offs. In contrast, this association is weaker within low tax rate countries that allow general deductibility. One explanation for this finding is that when the tax rate is low, the incentives are not sufficient to result in timely loan loss provisioning even though deductibility is permitted [13].

As a result of the above-mentioned empirical studies, when the amount of total reserves is deducted for the purposes of taxation of banks' profits, it is found that there is a positive relationship between loan loss reserves and the corporate profit tax rate. It follows that the impact of the corporate tax system is not the most important factor in the formation of reserves for possible loan losses, but the impact of the corporate tax system. The results of our empirical analysis confirm the main hypotheses of the previous research, namely, the positive relationship between the mandatory reserves for loan losses and the corporate income tax rate. found his confirmation.

6. Conclusion

In most countries, banks are required to make mandatory provisions for possible loan losses for financial accounting purposes, and tax deductions are applied to these mandatory reserves in the corporate tax regime. The corporate tax system encourages the timely recognition of potential loan losses. In many studies, it has been found that banks use loan loss provisions mainly for the purposes of profit reduction rather than for capital regulation. This is especially true in the periods after the Basel agreements, when the use of reserves in income management became more evident.

Banks have been found to use loan loss provisions to keep the level and volatility of high returns low in situations where earnings are very high and expected dividends are lower than current earnings. In addition, the formation of provisions for loan losses based on international financial reporting standards and US general accounting principles (GAAP), may lead to a reduction of Tier 1 capital and may be an additional burden on banks.

This study presents the results of the research on the impact of the corporate income tax system on the formation of provisions for possible loan losses. In turn, the results of this study are another scientific evidence of the use of reserves for possible losses on loans by commercial banks as a regulator of income. The effect of the corporate profit tax rate on the formation of reserves for possible losses on loans was studied in the study and was carried out based on the data of Agrobank and Rural Construction Banks in Uzbekistan. The results of empirical analysis revealed that loan loss reserves are positively related to the corporate income tax rate when the amount of total reserves is deducted in the taxation of banks' profits. Based on the obtained results, on average, a 1% increase in the profit tax rate can lead to a 3.9% increase in the amount of mandatory reserves for losses in Uzbekistan.

When taxing profits of commercial banks in Uzbekistan, if there are no restrictions on the deduction of reserves for loan loss provisions, the amount of reserves will increase at the level of income tax rate. This means that the impact of the

corporate tax system, rather than the increase in risks, is more essential for timely admitting loan loss provisions. For tax purposes, when total reserves are deducted, reserves for loan loss provisions are positively related to the corporate income tax rate, and tax incentives make a significant economic impact on creating reserves on possible losses.

Herewith, admitting loan loss provisions in the corporate tax system in due time can lead to the transparency of the banking system. Estimating the reserves for losses used to mitigate losses on banks' loan portfolios is considered a credit risk management tool.

The following aspects are crucially important in determining the procedure for taxation of compulsory reserves for loan loss provisions: (1) in determining taxable profit of the bank, which method is most convenient for loan loss provisions (write-offs or creating of reserves); (2) entire or partial compliance of reserves with taxation and regulation for possible loan loss provisions; (3) setting restrictions on the application of tax deductions to reserves for possible loan loss provisions.

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Stress Index of the Tax System of the Russian Federation in Terms of Tax Revenues

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ABSTRACT

Economic systems are increasingly exposed to external shocks of various nature, which test their resilience. The tax system, which is directly linked to the level of business activity, is one of the first to experience stress, so the ways it reacts to shock are of particular research interest. The 2020–2021 coronavirus pandemic made such studies more acute. The purpose of the paper is to develop and test new approaches in studying the resilience of the tax system in terms of tax revenues by analyzing the dynamics and structure of the tax system stress index in the Russian Federation in pre-pandemic, pandemic and recovery periods. The tax system stress index for tax revenues is calculated as the difference between the moving standard deviation and the moving average growth rate of tax revenues. We have developed a method for decomposing the stress index by source with determining the contribution of each tax to the average growth rate and to the standard deviation of the growth rate. We have also calculated the Russian Federation tax revenue stress index from December 2015 to March 2022 and identified its sources. It was found that the stress indices for almost all taxes (except for excises and state duties) are significantly positively correlated with each other. The main contribution to the growth of the stress index during the crisis and its decline within the recovery period is made by profit tax and a group of taxes on natural rent, which significantly negatively correlate with oil prices. Under the pandemic crisis in Russia, the stress index on revenue form special tax regimes also increased significantly. It was found that the personal income tax has a stabilizing effect on the tax system stress index in the crisis and post-crisis periods. During the pandemic in Russia, the damping role of excises also came to the fore, which is explained by institutional factors and changes in tax rates. The research findings can be advantageous for the authorities to make an impact on the most vulnerable components of the tax system of the Russian Federation in order to increase its resilience to crises.

KEYWORDS

tax system of the Russian Federation, taxes, tax revenues, growth rates, standard deviation, stability, stress index, decomposition

JEL H2, E3

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Индекс стресса налоговой системы Российской Федерации по налоговым доходам

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АННОТАЦИЯ

Экономические системы все чаще подвергаются воздействию внешних шоков разной природы, испытывающих их устойчивость. Налоговая система, непосредственно связанная с уровнем деловой активности, одна из первых испытывает стресс, поэтому ее реакции на шок представляют особый исследовательский интерес. Пандемия коронавируса 2020–2021 актуализировала подобные исследования. **Целью** статьи является разработка и апробирование новых подходов к исследованию устойчивости налоговой системы по налоговым доходам посредством анализа динамики и структуры индекса стресса налоговой системы в РФ в допандемическом, пандемическом и восстановительном периодах. Индекс стресса налоговой системы по налоговым доходам рассчитывается как разница скользящего стандартного отклонения и среднего темпа прироста налоговых поступлений. Разработана методика декомпозиции индекса стресса по источникам с выделением вклада каждого налога в средний темп прироста и в стандартное отклонение темпа прироста. Оценена динамика индекса стресса налоговых доходов РФ и выявлены его источники в период с декабря 2015 г. по март 2022 г. Установлено, что индексы стресса практически по всем налогам (кроме акцизов и государственной пошлины) значимо положительно коррелируют друг с другом. Основной вклад в рост индекса стресса во время кризиса и его снижение в восстановительный период вносят налог на прибыль и группа налогов на природную ренту, которые существенно коррелируют с ценами на нефть. Во время кризиса пандемии в России также сильно увеличился индекс стресса поступлений по специальным налоговым режимам. Обнаружено, что налог на доходы физических лиц оказывает стабилизирующее влияние на уровень индекса стресса в кризисный и посткризисный периоды. В период пандемии в России также проявилась демпфирующая роль акцизов, что объясняется институциональными факторами и изменением ставок налога. Полученные результаты могут быть полезными органам управления для воздействия на наиболее уязвимые составляющие налоговой системы РФ с целью повышения её устойчивости в периоды кризисов.

КЛЮЧЕВЫЕ СЛОВА

налоговая система РФ, налоги, налоговые доходы, темпы прироста, стандартное отклонение, устойчивость, индекс стресса, декомпозиция

1. Introduction

The tax system is an important part of the country's economic system, and its state is directly related to the processes in both the real and financial sectors of the economy. It sensitively and most promptly responds to economic crises and shocks of various nature (pandemic, environmental, sanctions, and others). State tax

revenues fit into modern business cycles and have some degree of procyclicality, which destabilizes the tax system overall. The procyclicality of tax revenues can be prevented by the rules of the tax system, the ones that concern rates, exemptions, base calculation, tax benefits, deferrals, credits, etc., which are either designed as automatic stabilizers or discretely adjust

in a cycle. On such occasions, tax revenues are less responsive to business cycles and shocks in the economy, making the tax system more resilient.

In turn, the resilience of the tax system to global crises and external shocks is also important for the resilience of the economic system as a whole. It contributes to the smooth financing of the public sector, which affects the stability of the provision of public goods to the population (Shon & Kwak [1]) and mitigation of fluctuations in business activity in the country (Fricke & Süßmuth [2]). The stability of tax revenues has an impact on aggregate demand and aggregate supply in the country. It is particularly important to study the reaction of the tax system to the economic crises and external shocks and to identify the sources of its resilience with the aim of managing state tax revenues in conditions of increased turbulence.

The correct measurement of the degree or level of tax revenues resilience plays an important role in their managing. One approach to such measurement, often used to analyse financial systems, is to determine their stress level.

The stress of the tax system is a state of its increased reaction to various adverse external and internal influence factors that destabilize the system and hamper its stable functioning. The tax system stress depends not only on macroeconomic processes in the country, but also on changes in the tax behaviour and tax culture of economic agents, as well as in the institutional environment, etc.

However, in most cases, the stress is ultimately expressed either in a change in the system revenue, or in an increase in its uncertainty or risk.

In our study, we adhere to the point of view that the lower the growth rate of tax revenues (the greater the loss in tax revenues) and the higher its volatility (uncertainty of tax revenues), the higher the stress of the tax system is. To do this, we use the methodology for determining the level of system stress previously proposed by Malkina & Ovcharov for other systems [3] and adapt it to the tax system. Assessment of the Russian tax system stress

in dynamics makes it possible to establish its connection with pre-crisis, crisis and recovery processes in the Russian economy.

To understand the nature of stress in the tax system, it is important to identify both its external factors, for example, changes in oil prices, economic growth or inflation, and internal sources. In this study, we do not touch upon the former issue, leaving it for a separate study. We are interested in internal sources of stress, its decomposition into individual taxes, tax groups and duties. Based on our understanding of the tax system stress in terms of tax revenues, it is important to separate contribution of each source to tax revenue growth rate and its volatility. According to the portfolio approach (developed by Markowitz [4], Sharpe [5], and applied to the tax system by Seegert [6]), the risk of a “tax portfolio” depends on its structure, the risk of each tax, and correlations of various taxes revenues with each other. The suggested additive decomposition of the tax revenue growth rate and its standard deviation by source (individual taxes and tax groups) captures the combined influence of these factors.

The purpose of the paper is to develop and test new approaches to the study of the resilience of the tax system in terms of tax revenues by analysing the dynamics and structure of the tax system stress index in the Russian Federation in the pre-pandemic, pandemic and recovery periods.

The hypothesis of the study is to confirm the existence of the drivers and dampeners of tax system stress in terms of tax revenues, which makes it possible to manage the resilience of tax revenues in the cycle and during unpredictable external shocks. This enables regulators to find the most vulnerable spots in the tax system, create more flexible tax and budgetary rules that allow to form state reserves and redistribute stress in time, space or between the levels of the budget system.

Further research follows way. The Literature Review section examines the various authors’ approaches to the analysis of economic and tax systems resilience, particularly in the context of the current

pandemic crisis, to measuring the stress of the financial system, and discusses the results of their use. The Data and Research Methodology section expands on the sources of information, describes in detail the author's methodology for assessing and decomposing the tax system stress index by tax revenues. The Results section reports the calculated and decomposed tax system stress indices by tax revenues in the Russian Federation for the period from 2015 to March 2022, and explains their dynamics in the pre-pandemic, pandemic and recovery periods. In the Discussion section, the research findings are analysed and compared with the results previously obtained by various authors, including us, and the limitations of the study and the prospects for its further development are revealed. The Conclusion section summarizes the results and main implications of the study.

2. Literature review

An analysis of the resilience of economic systems to external and internal shocks is of particular relevance during periods of crisis. Thus, such studies became increasingly widespread after the financial crisis of 2008–2010 (e.g. Martin et al. [7] and Xiao et al. [8]). The economic crisis caused by the spread of coronavirus infection in 2020–2021 was no exception. Researchers studying the stress resistance of economic systems are interested in general and specific manifestations of crisis phenomena in the economy under the influence of shocks of various nature (financial, epidemiological, sanctions, etc.).

Goswami et al. [9] and Devereux et al. [10] study the factors affecting the degree of response of various economies to the crisis and the speed of their subsequent recovery.

Pietro et al. [11] examine the resilience of the European Union countries and regions (the so-called NUTS) to three recessionary shocks, each of which activated different economic adjustments and mechanisms. Using a spatial general equilibrium model, this paper measures the vulnerability, resistance and resilience of European economies and identi-

fies key features that affect their ability to withstand and recover from unexpected external shocks. As a result, it was established that the reactions of different economies vary depending on the nature of the external shock, their pre-crisis characteristics, as well as the mobility of production factors.

Brada et al. [12] assess economic resilience as the system ability to absorb and recover from economic shocks. The authors examine 199 regions of Central and Eastern Europe after the 2008 global financial crisis. They find evidence of strong positive spatial effects leading to the formation of high-efficiency and low-efficiency clusters. Analysing the experience of regional recovery after the 2008 financial crisis, the authors modelled the impact of the COVID-19 pandemic on the regions' ability to return to pre-crisis employment levels.

Lagravinese et al. [13] study the impact of business cycles on the so-called buoyancy of tax revenues and how to manage it.

Based on a panel sample of 146 countries for 1981–2016, Ngangnon [14] shows that the instability of tax revenues negatively affects the share of non-resource taxes, but this influence decreases as GDP per capita grows.

The works devoted to the resilience of financial systems during the 2020–2021 pandemic are of particular interest. They examine the impact of the coronavirus crisis on macroeconomic, financial performance and tax revenues in various countries: Indonesia (Zamzam et al. [15]); Nigeria (Adesola & Owoniya [16]), Czech Republic (Koziel [17]), Azerbaijan (Suleymanzade [18]).

Shipalana & O'Riordan [19] explore the impact of the 2020 pandemic on financial stability in Africa. Experts estimate that the pandemic could have caused Africa to lose up to 20–30% of its fiscal revenues, which would have resulted in a number of African countries being unable to service their debt or even defaulting, which, combined with the decline in local currencies, could have caused a deep depression on the continent.

Based on a mixed-frequency data and using several machine learning techniques, Lahiri & Yang [20] predicted New York State tax revenues. Their estimates showed a sharp, over 16%, year-over-year decline in actual tax revenues in May 2020, followed by several upward revisions to the forecast. The projected recovery in tax revenue to -1% in March 2021 came close to the actual annual value of -1.6%.

A number of authors note that tax revenues during the pandemic were influenced not only by the crises per se, but also by policies to counteract them, including a package of tax breaks and exemptions.

Cheng [21], using the Malaysian economy as an example, proposes an expanded two-phase package of fiscal measures to support people and businesses during the pandemic and to overcome its consequences.

Corrick et al. [22] provide an overview of the consequences of the 2020 pandemic for the mining industry and evaluate the efficiency of various tax incentives. They have developed short-term tax policy options (including the ones for small and medium-sized enterprises in the industry) and described measures to be avoided.

Klimanov et al. [23] analyse how the COVID-19 pandemic affected regional budgets and the fiscal resilience of the regions of the Russian Federation. First, the authors analyse the state of Russian regional budgets before and under COVID-19 conditions. Second, they examine the growth in the regional debt dependence attributable to their increased spending commitments amid the pandemic. Third, the authors discuss anti-crisis fiscal measures that have been taken to combat the negative impact of COVID-19. They show that the economic crisis of 2020 is ambivalent for Russia because the pandemic in its acute phase was accompanied by a collapse in oil prices. The authors also estimated the volume of shortfalls in regional budget revenues in the first year of the pandemic.

Malkina [24; 25] investigated the impact of the 2020 pandemic on the budget revenues of Russian regions from different

taxes. The researcher based on the forecasting of non-pandemic trends concludes that the pandemic led to the loss of 13.9% of total tax revenues in the Russian Federation and 6.2% of tax revenues of regional budgets. Extractive regions were the hardest hit by the pandemic, because the largest contribution to the decline in tax revenues of the consolidated and federal budgets was made by the mineral extraction tax, the revenues on which fell sharply due to the decline in oil and gas revenues. The author also substantiates that the equalizing function of the Russian tax distribution system manifested itself in the formation of regional budgets revenues.

Kakaulina [26] forecasts the reduction in personal income tax revenues to the consolidated budgets of the constituent entities of the Russian Federation in 2020–2023 due to the COVID-19 pandemic. The author identifies three factors for forecasting the reduction in tax revenues: the amount of damage caused by the COVID-19 pandemic to the economic system as a whole; the sensitivity of the revenue base to the crisis; the sensitivity of regional tax revenues to changes in the revenue base.

Lykova [27] emphasizes the growth of excise tax revenues in Russian Federation under the conditions of the pandemic and the economic crisis caused by it. The author notes that the increase in the tax rates for some categories of excisable goods combined with the increase in the share of tax deductions to the regional budgets led to the growth of excise revenues in the regional budgets in 2020 by 6.5%, or 35.9 billion roubles. The author comes to the conclusion that the regions, which are generally considered to be quite prosperous and stable, show relatively less tax stability during the current economic crisis. In addition, the most economically active regions, which are highly dependent on their own tax revenues and the global economic situation, experience significantly greater difficulties than passive regions that rely on federal transfers.

Pinskaya et al. [28] note that the sustainability of the Russian tax system during the pandemic is also influenced by

the system of support measures for the population and businesses and the change in fiscal rules during the coronavirus crisis.

Pogorletskiy & Söllner [29] argue that pandemic crises per se cause significant changes in the rules of tax policy. These changes have long-term implications for the tax system.

A number of studies are devoted to the development and analysis of stress indicators for the economy in general or tax revenues in particular.

Shon & Kwak [1] conducted a comprehensive analysis of methods and models for quantitative assessment of financial instability of economic systems based on financial stress indices applied in the modern literature. The authors summarize the indicators of financial instability, show their relationship to stress tests, and analyse the vulnerability of economic systems to shocks of different nature.

Szendrei & Varga [30] propose a new stress indicator, the Factor-based Index of Systemic Stress, FISS. This index is based on the determination of the main components of the indicators characterizing the financial system. As a result, the authors conclude that the FISS should be a key element of the macroprudential toolkit for the Hungarian economy.

Stress indices are also used at the micro level to assess the financial resilience of business entities.

Atkeson et al. [31] examine the distribution of financial soundness among a wide range of companies over most of the last century (from 1926 to 2012).

Malkina & Balakin [32; 33] assess the risks of the Russian tax system. The authors understand the instability of the tax system as the degree of its reaction to changing macroeconomic factors within the economic cycle. They conclude that minimizing the negative impact of external shocks on the tax system is possible by changing its rules, managing the sectorial structure of the economy and increasing the degree of its diversification.

It is important to note that the macroeconomic stress indices used in the literature mostly concern the analysis of financial markets or the state of the banking system

and are almost never used for the analysis of tax revenues. In the present study, applying and adapting the methodology [1], we propose for the first time the stress index of the tax system in terms of tax revenues (tax system stress index). Using it, we analyse the dynamics of the stress of total tax revenues and revenues from individual taxes to the consolidated budgets of the constituent entities of the Russian Federation (regional budgets) in the context of changes in the macroeconomic situation, development of crisis and economic recovery during the coronavirus pandemic. We also carry out the decomposition of stress index by source, which allows us to identify taxes and tax groups that are amplifiers and dampeners of the tax system stress in the pandemic conditions.

3. Data and research methodology

This study is based on the data retrieved from the statistical reporting form 1-NM of the Federal Tax Service of the Russian Federation (FTS RF)¹. We used information on tax revenues in general and on individual taxes (tax groups) in monthly terms for the period from January 2013 to March 2022. The data is presented in terms of five taxes and duties administered by the FTS RF:

- 1) corporate income (profit) tax;
- 2) personal income tax;
- 3) value added tax;
- 4) excise taxes;
- 5) state duty;

as well as two consolidated groups of taxes:

6) natural taxes (mineral extraction tax, regular payments for the extraction of minerals (royalties) when implementing production sharing agreements; water tax; fees for the use of fauna objects and for the use of objects of aquatic biological resources). The main contribution in this group belongs to the mineral extraction tax;

7) property taxes (personal property tax, corporate property tax, transport

¹ Report on the accrual and receipt of tax revenues, fees, insurance premiums and other obligatory payments to the budget system of the Russian Federation. URL: https://www.nalog.gov.ru/rn77/related_activities/statistics_and_analytics/forms/

tax, gambling tax, land tax and property tax levied on real estate property located within the boundaries of the cities of Veliky Novgorod and Tver).

In order to exclude the influence of seasonality and different frequency of tax payments, we calculated the moving annual values of tax revenues with a one-month shift. First, we computed the annual revenues from January 2013 to December 2013 on an accrual basis, then the annual revenues from February 2013 to January 2014, and so on: each new value was determined with a shift of one month and covered 12 adjacent months. Thus, we obtained a smoothed series of annual tax revenues. Accordingly, the growth rate of annual tax revenues was determined with a lag of 12 months and a step of 1 month. The first value was calculated for December 2014 and represented the relative increase in tax revenues in 2014 compared to 2013; the last growth rate was determined for March 2022.

Below is the methodology for calculating the tax system stress index:

1. The moving growth rate of annual tax revenue from the k -tax (t_{kj}) or from all taxes (t_j) referring to the j -month, calculated with a one-month shift:

$$t_{kj} = \frac{T_{kj}}{T_{kj-12}} - 1 \quad \text{or} \quad t_j = \frac{T_j}{T_{j-12}} - 1, \quad (1)$$

where

$$T_{kj} = \sum_{j=J-11}^j T_{kj} \quad \text{and} \quad T_j = \sum_{j=J-11}^j T_j -$$

the amount of revenues, respectively, from the k -tax and all taxes for 12 consecutive months, ending with J -month;

$$T_{kj-12} = \sum_{j=J-23}^{J-12} T_{kj} \quad \text{and} \quad T_{j-12} = \sum_{j=J-23}^{J-12} T_j -$$

the amount of revenues, respectively, from the k -tax and all taxes for 12 consecutive months, ending with $J-12$ -month;

2. Moving average growth rate for 12 consecutive months, ending with J - month:

$$\tau_{kj} = \frac{\sum_{j=j-11}^j t_{kj}}{12} \quad \text{or} \quad \tau_j = \frac{\sum_{j=j-11}^j t_j}{12}. \quad (2)$$

3. The moving standard deviation of the tax revenue growth rate for 12 consecutive months ending with J -month:

$$\sigma_{kj} = \sqrt{\frac{\sum_{j=j-11}^j (t_{kj} - \tau_{kj})^2}{12}} \quad (3)$$

$$\text{or} \quad \sigma_j = \sqrt{\frac{\sum_{j=j-11}^j (t_j - \tau_j)^2}{12}}.$$

4. Stress index of tax system in terms of tax revenues:

$$SI_{kj} = \sigma_{kj} - \tau_{kj} \quad \text{or} \quad SI_j = \sigma_j - \tau_j. \quad (4)$$

Lower growth rates of tax revenue reduce the budget system provision and limit the available resources for financing public goods and national projects. Higher volatility of these rates increases the uncertainty of budget revenues and characterizes a quantitative measure of their risk. According to our approach, both factors increase the stress of tax system in terms of tax revenues. In other words, the proposed stress index shows the risk of tax revenues adjusted for the measure of their growth. This index can be measured in fractions (points) or as a percentage. In our work we use the first approach.

5. Decomposition of tax system stress index by k -sources (taxes and tax groups).

5.1. Decomposition of the growth rate of total tax revenues by source:

$$t_j = \frac{T_j}{T_{j-12}} - 1 = \frac{\sum_{k=1}^K T_{kj}}{T_{j-12}} - 1 =$$

$$= \sum_{k=1}^K \frac{T_{kj}}{T_{kj-12}} \cdot \frac{T_{kj-12}}{T_{j-12}} - 1 = \quad (5)$$

$$= \sum_{k=1}^K (t_{kj} + 1) \cdot \alpha_{kj-12} - 1 = \sum_{k=1}^K t_{kj} \cdot \alpha_{kj-12},$$

where

$$\alpha_{kj-12} = \frac{T_{kj-12}}{T_{j-12}} -$$

share of k -tax (tax group) in total tax revenues a year ago, with

$$\sum_{k=1}^K \alpha_{kj-12} = 1.$$

Thus, the contribution of each tax to the growth rate of total tax revenues is defined as the product of its own growth rate and its share in tax revenues in the base period:

$$t_j(k) = t_{kj} \cdot \alpha_{kj-12}. \tag{6}$$

For the average growth rate, the same rule is followed as for the growth rate in a particular period (formula 5):

$$\tau_j = \frac{\sum_{j-11}^j \sum_{k=1}^K t_{kj} \cdot \alpha_{kj-12}}{12} = \sum_{k=1}^K \tau_{kj} \cdot \alpha_{kj-12}. \tag{7}$$

Accordingly, the contribution of each tax to the average growth rate of tax revenues is determined by the formula:

$$\tau_j(k) = \tau_{kj} \cdot \alpha_{kj-12}. \tag{8}$$

5.2. Decomposition of the standard deviation of the growth rate of total tax revenues by source:

$$\begin{aligned} \sigma_j &= \frac{\sigma_j^2}{\sigma_j} = \frac{Var(t_j)}{\sigma_j} = \\ &= \frac{CoVar\left(t_j; \sum_{k=1}^K t_{kj} \cdot \alpha_{kj-12}\right)}{\sigma_j} = \tag{9} \\ &= \frac{\sum_{k=1}^K CoVar(t_j; t_{kj} \cdot \alpha_{kj-12})}{\sigma_j}, \end{aligned}$$

where $Var(t_j) = CoVar(t_j; t_j)$ – variance, aka the covariance of the moving growth rates of tax revenues. After replacing t_j with the equation from formula (6) and applying the rule for sum covariance, we obtain an additive decomposition of the standard deviation of the growth rate by sources (taxes).

Then the contribution of each tax to the standard deviation of the growth rate of tax revenues is determined by the formula:

$$\sigma_j(k) = \frac{CoVar(t_j; t_{kj} \cdot \alpha_{kj-12})}{\sigma_j}. \tag{10}$$

In other words, it depends on the share of this tax in tax revenues in the base period and the relative covariance of its growth rate with the growth rates of other taxes.

5.3. Decomposition of the tax system stress index by source:

$$SI_j = \sigma_j - \tau_j = \sum_{k=1}^K (\sigma_j(k) - \tau_j(k)). \tag{11}$$

The application of this methodology made it possible to obtain time series of stress indices for tax revenues as a whole, as well as for individual taxes for the period from 2015 to March 2022 and to identify the impact of the crisis caused by the pandemic on the Russian tax system stress in terms of tax revenues. This methodology also allowed us to estimate the contribution of each tax to the change in the tax system stress index under the influence of external shocks and to answer the question of which taxes act as amplifiers and which dampeners of overall stress.

4. Results

First, we present the dynamics of the tax system stress index calculated according to formulas 1–4 for the total tax revenues in the country (Fig. 1). Then, in order to clarify its specific components, we separately consider the tax system stress indices on revenues from individual taxes (Fig. 2).

As can be seen from Figure 1, the tax system stress index was rising during the imposition of the 2015–2016 sanctions and the 2020–2021 pandemic crisis. This index begins to grow rapidly as early as June 2019, that is, long before the pandemic. It is noteworthy that, according to our methodology, the index for June 2019 reflects stress from July 2018 to June 2019. However, it did not exceed the zero threshold throughout the larger pre-pandemic study period (with the exception of a few cases in early 2017, which were due to crisis events in 2014–2016). In June 2020, the stress index again reached positive values and continued to rise until July 2021 (with a slight decrease in March 2021), reflecting the impact of the pandemic. During the recovery period it began to decrease, and by January–February 2022 the stress index returned to the negative zone.

The data on the tax system stress index for revenues from particular taxes (Fig. 2) allow us to draw several conclusions. First of all, stress indices for almost

all taxes (except excises and state duty) show a strong positive correlation. The highest correlation (with Pearson's correlation coefficient of 0.97) is demonstrated by the profit tax and the group of taxes on natural resource rents. For these taxes, as well as for the tax system as a whole, the increase in the stress index began as early as the second half of 2019 (namely, for the group of natural taxes in June 2019, for the profit tax in September 2019), that is, before the pandemic hit.

From June 2019 to August 2021, the stress index on revenues from the group of natural resources taxes increased by 0.82 points (which is the maximum value among all taxes), and on revenues from the profit tax by 0.39 points. In addition, for the group of natural taxes, there is the largest among all taxes negative relationship between the stress index and oil price with a lag of 6 months (their linear Pearson correlation coefficient is $R = -0.65$). This indicates a significant influence of the world oil market conditions on the state of the Russian tax system.

Close correlation of stress indices with each other (with Pearson's linear correlation coefficients from 0.7 to 0.9) is noted for profit tax, personal income tax, VAT, group of taxes on natural resource rent and special tax regimes. At the same level there is a correlation of the property taxes stress index with the profit tax stress index

and the stress index for the taxes on natural rent. All this indicates similar dynamics of stress indices for major taxes.

The increase in the stress index for the above tax revenues begins from March 2019 to March 2020, which is largely due to the changing global oil market conditions. Indeed, in November 2018, the average monthly price of Brent crude oil fell to \$54 per barrel, compared to \$83 in August 2018, which affected subsequent tax revenues. The stress index for property tax revenues began to rise earlier than for other tax revenues (as early as March 2019). It is also noteworthy that this index shows a medium strength relationship with stress indices for special tax regimes (0.65), personal income tax (0.50), and VAT (0.48).

For personal income tax and special tax regimes, as in the case of the previously mentioned natural resources taxes and profit tax, the growth of the stress index began in the second half of 2019 (for personal income tax in July 2019, for special regimes in October 2019). Later than others among the designated taxes there is a growth of the stress index for VAT revenue, which had its manifestation with the introduction of restrictions on mobility of the population and business activity of enterprises, i.e., since March 2020. This can be explained by the fact that due to its indirect nature, VAT is more related to economic activity and the formation of value added.

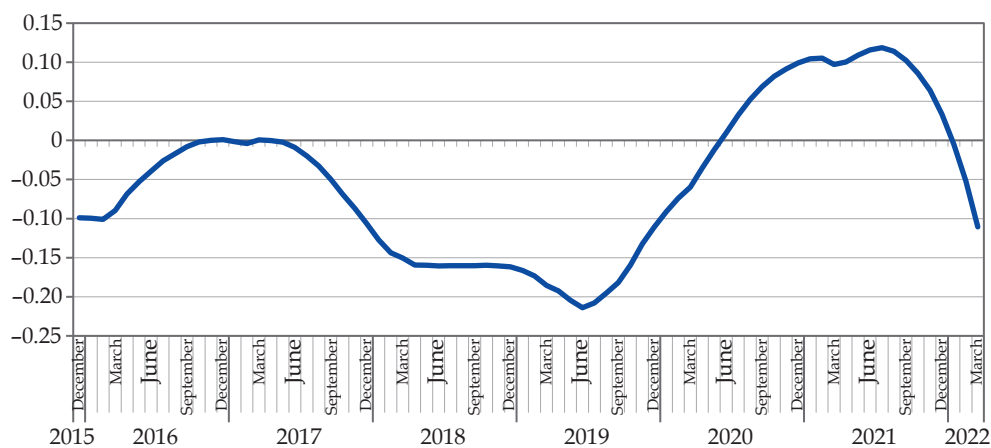


Figure 1. Russian tax system stress index for total tax revenues (points)

Source: authors' elaboration based on the data of the Federal Tax Service of the Russian Federation (hereinafter referred to as the FTS RF)

Special tax regimes show the second highest (after the group of natural resources taxes) increase in the stress index by 0.60 points (continuing from October 2019 to May 2021). This is explained by the fact that this group includes taxes from small businesses, which were at risk during the

pandemic (in particular, the service sector, where small businesses operating under simplified taxation schemes predominate, was affected). In addition, a package of stimulating fiscal measures was applied to small businesses, which also affected the revenues of the tax system and its stability.

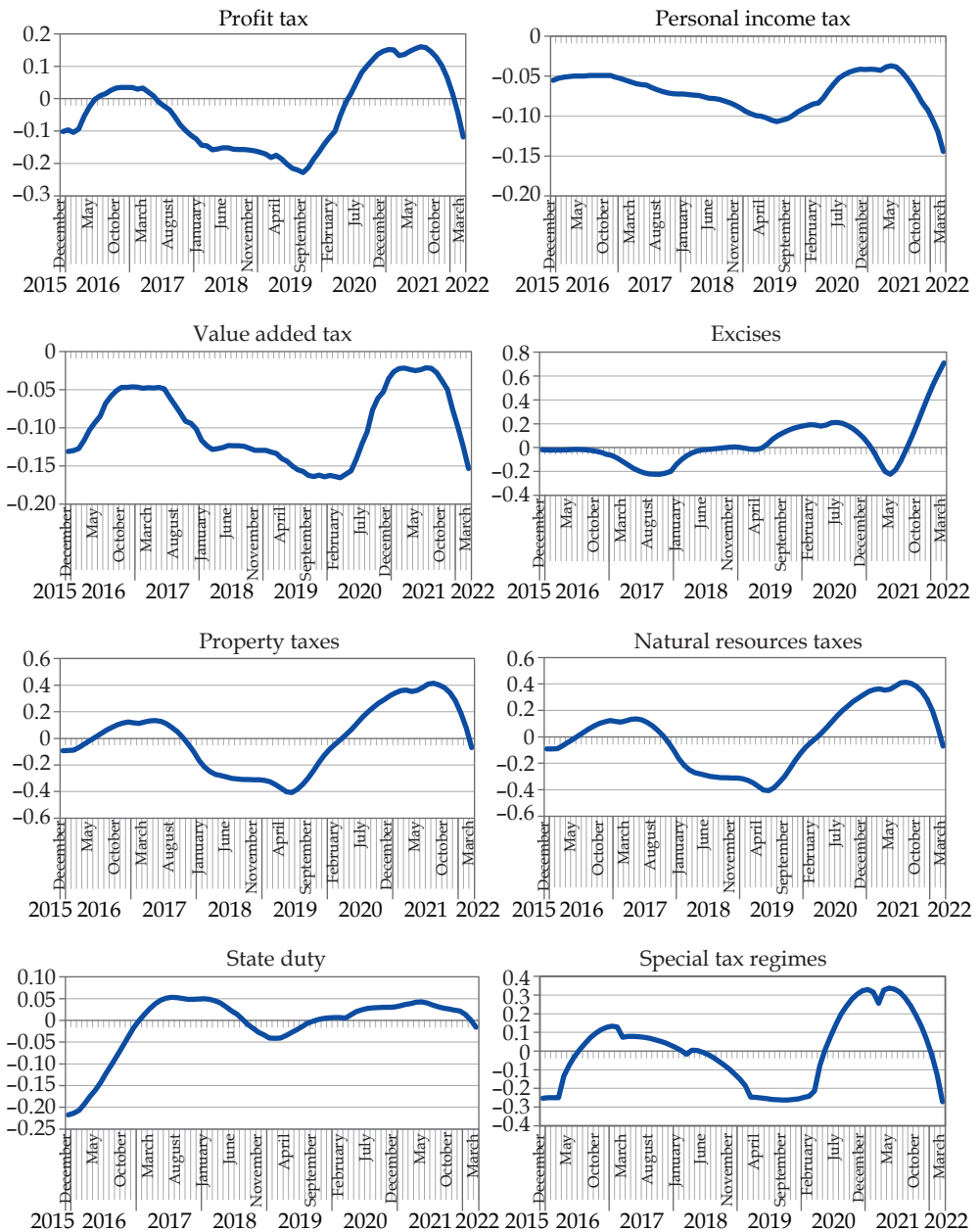


Figure 2. Russian tax system stress index for the revenues from individual taxes and duties (points)

Source: authors' elaboration on the basis of the FTS RF data

It should be noted that, on average, from March 2020 to February 2021 the revenues from special tax regimes decreased by 24%. Finally, a significant increase in the stress of tax revenues under special tax regimes can be explained by the fact that one of the special tax regimes applies to production sharing agreements. Specifically for the Sakhalin region, where this regime is applied, the growth of the stress index over the period under consideration amounted to 1.64 points, and the revenues in this region decreased by 81%.

For the property tax group, the stress index increase from March 2019 to December 2020 was 0.18 points. For VAT for the year from March 2020 to March 2021, the stress index rose by 0.14 points, which is lower than for total tax revenues (0.33 points), but higher than for personal income tax, property taxes, and state duties for the same period.

Among all taxes and tax groups, the personal income tax shows the smallest increase in the stress index: in virtually two years (from July 2019 to May 2021) the stress increased by only 0.07 points.

An important feature of all the taxes analyzed above is that at the end of the study they had already passed the maximum point of the stress index, therefore, there is certain correction in the dynamics of these taxes. The group of property taxes demonstrates the decrease in the stress index first among all the taxes. The decrease in the stress index for this group began as early as December 2020, mainly due to an increase in the growth rate of revenues, which is explained by the low base effect. Indeed, in the second quarter of 2020 (from April 1 to June 30, 2020), certain categories of taxpayers working in pandemic-stricken sectors of the Russian economy, as well as socially oriented non-profit and religious organizations, were exempted from paying property taxes and advance payments.

In accordance with the list of the Government of the Russian Federation, such industries include transport, activities in the field of culture, leisure and entertainment, fitness and sports, travel agencies and other organizations providing servi-

ces in tourism, hospitality, catering, organizations of additional education, non-governmental educational institutions, the organization of conferences and exhibitions, the provision of household services to the public (repairs, laundry, dry cleaning, hairdressing and beauty salon services), activities in health care, retail trade in non-food products, media and printing production.

For VAT the reduction of the stress index began in March 2021, and for personal income tax and special tax regimes in May 2021. The maximum decrease in the stress index is demonstrated by special tax regimes: from May 2021 to February 2022, their stress index decreased by 0.46 points (while during the crisis it increased by 0.6 points). For natural resource rent taxes, the stress index decreased by 0.34 points from August 2021; for profit tax, it decreased by 0.2 points from July 2021 to the end of the period under review. For other taxes, the decrease is no more than 0.1 points. It should be also noted that profit tax, property tax and special tax regimes returned to the zone of negative stress index, while the stress index for VAT and personal income tax did not reach positive values even during the pandemic.

There is no close correlation between the stress indices on revenues from excise taxes and state duty and the stress indices on revenues from other taxes. It is only evident the average degree of correlation of the stress index on revenues from state duties with the stress indices on revenues from special tax regimes (0.51) and property taxes (0.47).

At the same time, state duties and excise taxes show a rather interesting stress index trajectory. The stress index for excise revenues begins to rise in September 2017, and with a slight adjustment in early 2019, its growth continues until July 2020. The stress index then goes rapidly downward and by May 2021 reaches its low point, down 0.43 points in 10 months. In other words, the previous period's (April 2019 July 2020) increase of 0.23 points in the excise tax revenue stress index was almost halved by its subsequent decline.

Thus, excises turned out to be the only tax that demonstrated a decrease in the stress index during the pandemic. This is partly explained by a rather active policy of the Russian Government regarding excise taxes: from 2020 fuel tax rates were raised, tobacco rates were increased by 20% (in addition, any electronic cigarettes and tobacco heating devices became excisable). But then the stress index began to skyrocket: from May 2021 to February 2022, it rose by 0.85 points, and by the time the study ended (March 2022) the stress index on excise tax revenues was the highest of all other taxes.

The state duty shows an increase in the stress index since the beginning of the study (December 2015). The stress index reaches its maximum in July 2017, then decreases until February 2019 and then increases again by 0.08 points until May 2021. A further decrease in the stress index (from June 2021 to February 2022) allows its previous increase to be offset by half (-0.04 points). However, on the whole, at the end of the period under study the stress index on state duty revenues appears to be 0.22 points higher than the

initial level. Such dynamics of the stress index can be explained by the impact of institutional changes (introduction of new tariffs of duties) and less direct linkage of the duty with economic processes.

According to the portfolio approach, the tax system stress index as a whole depends on the stress indices of each tax, on the structure of tax revenues (the share in them of individual taxes) and the relationship between the revenue growth rates for different taxes (or rather, the correlation of stress indices on individual taxes or tax groups). The developed methodology of decomposition of the tax system stress index (formulas 5–11) allows us to capture the joint influence of all these factors.

Figures 3 and 4 present a dynamic decomposition of the tax system stress index separately for the two stress components: the growth rate of tax revenues and their standard deviation. Figure 5 combines the results of the decomposition of the tax system stress index on tax revenues by source. In addition, Figure 6 shows the average structure of the stress index during periods of negative and positive values of the overall stress index.

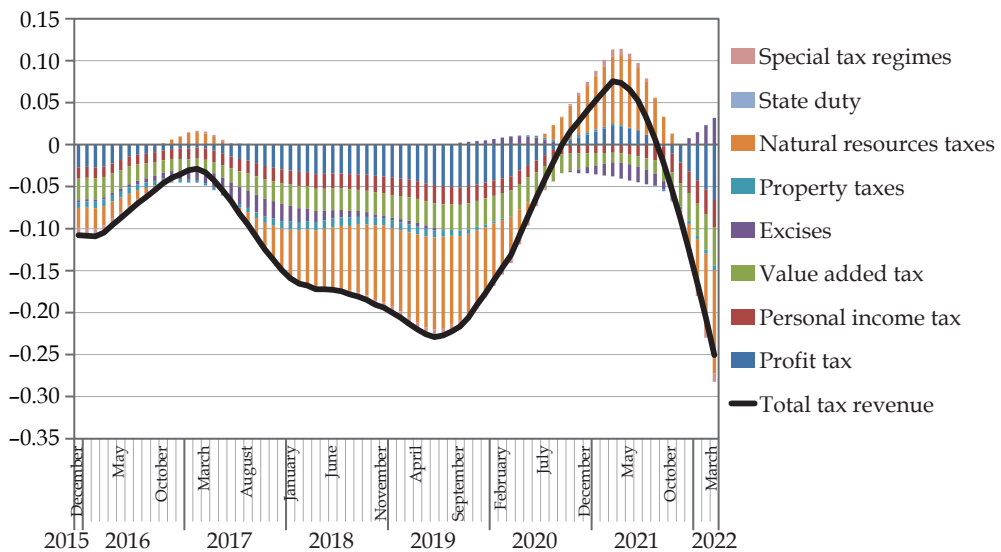


Figure 3. Source decomposition of the tax revenue growth rate of the Russian tax system stress index (points)

Source: author’s elaboration based on the data of the FTS RF

Note. Since the growth rate of tax revenues reduces risk, their components are taken with the opposite sign

The figures show that during the period of economic recovery and stress reduction, the profit tax, VAT and the group of natural resources taxes grow at the highest rate. For example, from June 2017 to June 2020, total tax revenues rose by 34 percent, with VAT revenues up 48 per-

cent, the natural resources tax group up 42 percent, and profit tax revenues up 40 percent. In other words, these three out of the four most productive tax revenues (that is, excluding the personal income tax) increased at a faster rate than the total tax revenues.

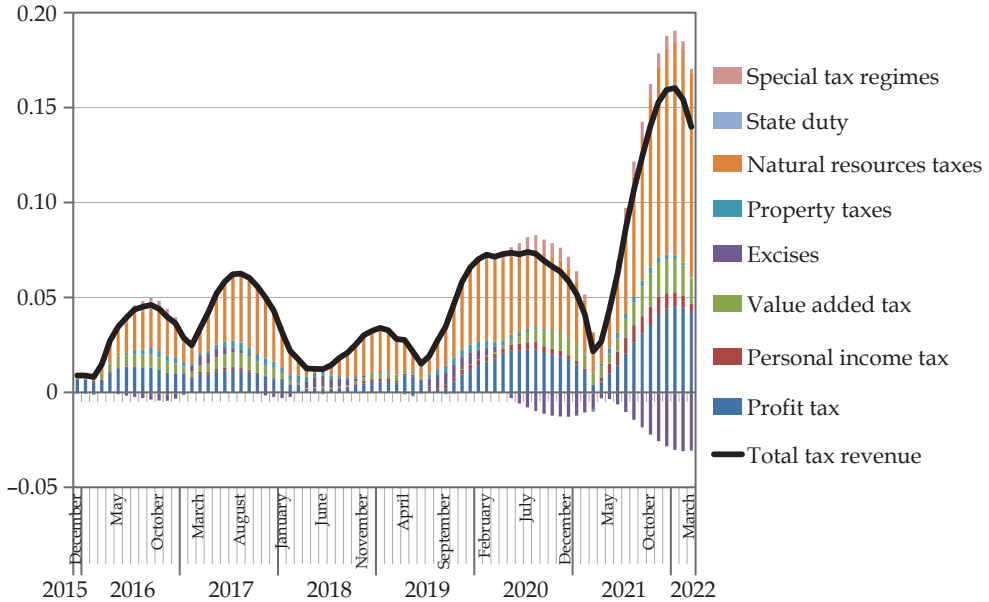


Figure 4. Source decomposition of the standard deviation of the tax revenue growth rate of the Russian tax system stress index (points)

Source: author’s elaboration based on the data of the FTS RF

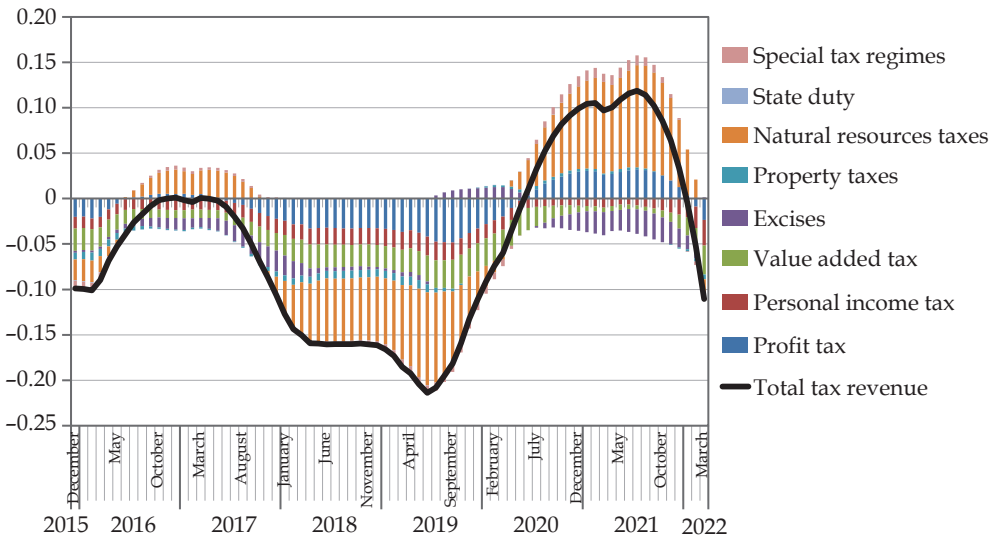


Figure 5. General decomposition of the Russian tax system stress index in terms of tax revenues by source (points)

Source: author’s elaboration based on the data of the FTS RF

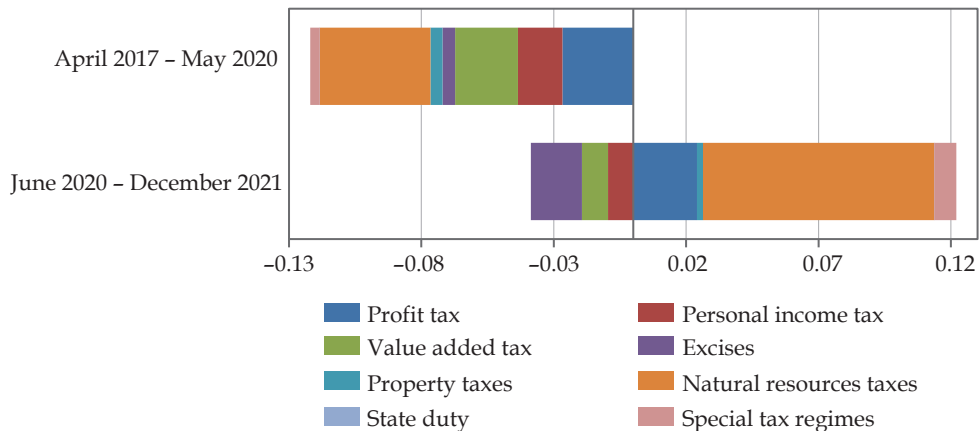


Figure 6. The average structure of the Russian tax system stress index in the periods of its negative and positive values (points)

Source: author's elaboration based on the data of the FTS RF

The same conclusion is confirmed by the data on the correlation coefficient for the growth rate of total tax revenues and specific taxes: the profit tax and the group of natural resources taxes show a correlation coefficient with total revenues at the level of $R=0.97$, VAT - at the level of 0.85. However, we should note that the other taxes also demonstrate high correlation coefficients: special tax regimes - at the level of 0.82, personal income tax - 0.77, excises - 0.71, property taxes - 0.68. The only tax, which growth rate weakly correlates with the growth rate of total tax revenues - the state duty ($R=0.14$).

It should be noted that during an economic downturn, stress also grows mainly due to natural resources taxes and profit tax. Revenues from them decrease, and their volatility increases at a faster rate (it is worth reminding that, along with special tax regimes, profit tax and natural resources taxes during the crisis show the maximum growth of the stress index).

During the coronavirus crisis, the dampening role of excises unexpectedly manifested itself. Institutional (changes in excise rates for various goods) and structural factors played an important role in this. Thus, in July 2020, when the stress index went into positive zone and excise taxes went into negative zone, 32% of excise revenues came from tobacco products,

22% from motor gasoline, 17% from diesel fuel, 10% from spirits, 9% from beer, and 8% from petroleum raw materials.

A year later, in July 2021, with total revenues from excise taxes at about 600bn rubles, almost 500bn rubles of returns were on excise taxes on crude oil, i.e. in their absence the revenues from excise taxes could have been twice as much. In January 2022, when the stress index returned to the positive zone, the negative revenues from excise taxes on crude oil were already 4.73 times higher than the total revenues from excise taxes. This situation is explained by the fact that an additional investment surcharge on the excise tax on petroleum crude was imposed for 10 years beginning in 2021, which increased the amount of the reverse excise tax introduced in 2019².

It should also be noted that the personal income tax almost always, regardless of the study period, plays a weak damping role. This is due to the most stable growth rates of revenues from this tax. Indeed, the standard deviation of the growth rate of personal income tax is the lowest among all the taxes and tax groups under consideration. And it is 3.35 times less than the standard deviation of the growth rate of total tax revenues.

² <https://www.interfax.ru/business/793221>

5. Discussion

The study confirms the earlier hypothesis that certain taxes play the role of amplifiers or dampers of tax revenue stress on the tax system of the Russian Federation. We have obtained convincing evidence that the stress enhancers in the Russian tax system are the mineral extraction tax and the profit tax, and to add to the above, in the pandemic conditions special tax regimes because of the greater vulnerability to the Covid19-related crisis of small business.

The main stress damper is the personal income tax. The changes of the institutional conditions impact significantly the stress of the tax system on revenues from specific taxes, often redistributing it over time.

This was demonstrated by property taxes, for which a number of exemptions were introduced during the pandemic, and excise taxes, which experienced rate changes and refunds during the pandemic and recovery periods.

Indeed, among all the taxes, the maximum values of the stress index growth during the pandemic are demonstrated by the group of natural resources taxes (+0.29 p.p. in just four months from March to June 2020), followed by special tax regimes and profit tax (+0.12 p.p. over the same period). Stress for VAT and property taxes is comparable with the stress on total tax revenues. Stress on personal income tax is lower than for the whole tax system. Besides, personal income tax is the only tax for which the stress index at the end of the period under consideration turned out to be lower than at the beginning.

Decomposition of the tax system stress by tax revenues from different sources presented even more convincing evidence that mineral extraction tax and profit tax in Russia can be regarded as amplifiers of the overall tax system stress (their contribution to the overall tax system stress during its growth period was +105.7% and +29.1% respectively), and personal income tax as a stress damper (its contribution was -11.5%).

The conclusion about the greater stress on tax revenues from the mineral

extraction tax and profit tax largely correlates with the conclusions obtained earlier in our study of the risk of the Russian tax system [34] using alternative methods.

The new study differs from the previous one in several ways.

First, it uses moving annual tax revenues rather than monthly data, which eliminates the effects of seasonality and frequency of tax payments.

Second, it deals with the growth rate of tax revenues as a baseline, rather than the return on individual taxes as the ratio of tax revenues to gross domestic product or regional gross value added.

Third, it is a dynamic rather than a static approach applied, which allows us to track the stress of the tax system over time and further incorporate the stress index into other models.

Fourth, we apply a different method to account for the trade-off between return and risk of tax revenues. Usually for this purpose coefficients of variation are used as the ratio of risk and return [1; 6; 14; 34], while we take the difference between risk and return, which is closer to the representation of the Arrow-Pratt-type portfolio utility functions.

It is noteworthy that the change in the stress index of the tax system for different taxes occurs at different times, although it describes similar dynamics. Thus, for most taxes, the increase in the stress index occurs during the 2015–2016 sanctions shock, then the stress index decreases, and its growth resumes in 2019–2020 (the exception is excise taxes, for which the increase in stress index began later). First, stress increases for property taxes, then for a group of natural resources taxes and personal income tax, and then for profit tax and special tax regimes.

One of the significant factors of the leading dynamics of the tax system stress on the revenues from most taxes was the decline in world oil prices. Therefore, it is impossible to state unequivocally that the pandemic was the only reason for the growth of tax stress in the period under consideration. However, it was definitely an important reason for its subsequent growth. Later than others (in March 2020)

the VAT stress index began to grow. In this case we can speak more confidently about the pandemic as a cause of tax system stress.

Our study did not seek to distinguish between the impact of the pandemic and other factors (e.g., oil prices or sanctions) on fiscal stress, nor did it seek to determine the relationship of the factors themselves (e.g., the pandemic and the oil shock). We leave this task for the future, which will require other methods.

The conducted study has no direct analogues for comparison, as there was introduced a new methodology for assessing the resilience of the tax system by tax revenues through the construction and decomposition of the tax system stress index, which has been tested on the examples of the pre-pandemic, pandemic and recovery periods of the Russian economy. Its use also allowed us to obtain new results concerning the different speed and degree of tax response to the shock, their interaction and the influence of institutional factors (the rules) on smoothing or intensification of the stress. At the same time, specific conclusions about the impact of the pandemic on individual tax revenues in the Russian Federation are generally consistent with the results of other authors [23–27].

While the approaches and results are undoubtedly novel, this study has a number of limitations.

First, we did not distinguish between the effects of economic growth and inflation on the increase in tax revenues. It is possible that deflation of indicators and exclusion of the influence of price growth will adjust the conclusions obtained concerning the strength of the stress in different periods.

Second, our stress index, which has something in common with Arrow-Pratt's portfolio utility function, does not include a risk attitude (or risk perception) parameter, which requires a justification for introducing an appropriate coefficient for the standard deviation of the tax revenue growth rate. We also leave all of these issues for future research, which may lead to more sensitive conclusions.

6. Conclusion

The paper proposes a methodology for assessing the tax system stress in terms of tax revenues and its decomposition by source (individual taxes, duties and tax groups). The peculiarity of the methodology is the exclusion of the influence of seasonality, as well as different periodicity of tax payments. The tax revenues stress index is presented as the difference between the moving standard deviation and the moving average value of the growth rate of tax revenues for 12 contiguous months with the step of one month, which allows to take into account both return and risk of tax revenues. The developed method has been tested on the example of tax revenues to the consolidated budget of the Russian Federation in 2013 up to March 2022. Its application made it possible to estimate the dynamics of the tax system stress in the pre-pandemic, pandemic and recovery periods, to reveal the synchronous changes and correlation of the stress indices on individual tax revenues, their connection not only with the pandemic, but also with the drop in oil prices.

Decomposition of the tax system stress by tax revenues confirmed the acceleration role of mineral extraction tax and profit tax, as well as the damping role of personal income tax in the dynamics of overall stress. At the same time, it demonstrated the peculiarity of the pandemic crisis, which small businesses were most vulnerable to, which significantly increased the stress on revenues from special tax regimes. Finally, it showed the important role of institutional rules, which was evident in the analysis of the stress on excises and property taxes revenues.

The conducted research has theoretical and practical significance. It clearly demonstrates that increasing the flexibility of tax rates, the formation of insurance reserve funds, the implementation of the tax rule in the budget system support redistribution of risks and management of the tax revenue stress over time. A detailed study of these issues is the subject of future research.

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Determinants of Business House Rental Income Taxpayers' Compliance with Tax System in Afar Region, Northeast Ethiopia

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ABSTRACT

The biggest impediment to the Ethiopian government's ability to raise revenue by its means to the required level is the lack of taxpayers' compliance behavior with the tax system. Therefore, this study examines the key determinants of taxpayers' compliance behavior with the tax system in the Afar regional state. To this end, two purposively selected woredas (Awash and Aba'ala) and one city administration (Samara-logia) were used. Primary data were collected from 404 randomly selected respondents. The ordered logistic regression model was used to analyze the factors that determine tax compliance. Results show that tax knowledge, probability of detection, perception of government spending, organizational strength of the tax authority, fairness of the tax system, and simplicity of the tax system have positive effects on tax compliance, whereas tax rates have a negative effect on tax compliance in the Afar regional state. As a result, it is suggested that the tax authorities launch effective and brief awareness-development and tax education programs for the general public and taxpayers in particular. The tax system, notably the tax return, tax forms, and tax rules, should be simplified by the tax authorities so that they are readily understood by taxpayers. Furthermore, the tax authorities should be powerful enough to effectively and efficiently enforce the tax laws, and to ensure tax fairness, their tax liability must be determined by their ability to pay. Lastly, the government must maintain accountability and transparency in how tax revenue is dispensed, as well as deliver social services to the public efficiently and intelligently so that taxpayers have faith in and a favorable attitude toward the taxes they pay and the tax system.

KEYWORDS

tax compliance, rental income tax, ordered logit, Afar region, Ethiopia

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Детерминанты соблюдения налогового законодательства плательщиками налога на доходы в регионе Афар, Северо-Восточная Эфиопия

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АННОТАЦИЯ

Несоблюдение налогоплательщиками налогового законодательства является существенным препятствием для правительства Эфиопии в увеличении собственных доходов до необходимого уровня. В исследовании рассматриваются ключевые детерминанты соблюдения налогоплательщиками налогового законодательства в регионе Афар. Для целей исследования выбраны два поселения

(Аваш и Абаала) и одна городская администрация (Самара-логия). Первичные данные собраны у 404 респондентов посредством случайной выборки. Для анализа факторов, определяющих соблюдение налогового законодательства использовалась упорядоченная модель логистической регрессии. Результаты, полученные в регионе Афар показали, что налоговые знания, вероятность обнаружения, восприятие государственных расходов, организационный потенциал налогового органа, справедливость налоговой системы и простота налоговой системы оказывают положительное влияние на соблюдение налогового законодательства, в то время как налоговые ставки имеют отрицательное влияние. В результате предлагается, чтобы налоговые органы запустили эффективные и краткие программы повышения осведомленности и налогового образования для широкой общественности и налогоплательщиков в частности. Налоговая система, в частности налоговая декларация, налоговые формы и налоговые правила, должны быть упрощены, чтобы быть понятными налогоплательщикам. Кроме того, налоговые органы должны быть достаточно сильными, чтобы эффективно и действительно обеспечивать соблюдение налогового законодательства. При этом для обеспечения налоговой справедливости налоговые обязательства плательщиков должны определяться их платежеспособностью. Наконец, правительство должно поддерживать подотчетность и прозрачность в том, как распределяются налоговые поступления, а также предоставлять социальные услуги населению эффективно и разумно, чтобы налогоплательщики верили и благосклонно относились как к налогам, которые они платят, так и к налоговой системе в целом.

КЛЮЧЕВЫЕ СЛОВА

соблюдение налогового законодательства, налог на доход от аренды, логистическая упорядоченная модель, регион Афар, Эфиопия

1. Introduction

The development and economic growth of any nation are typically dependent on the volume of revenues that the country can earn and invest in public infrastructure [1]. Taxes are crucial as the government's principal source of revenue and a means of funding critical programs such as education, welfare, public safety, health care, infrastructure, and road development for the public at large [2]. As a corollary, to continue economic growth and achieve infrastructure and social development, all governments across the world should raise their tax revenue in proportion to their gross domestic product (GDP) [3].

Many developed countries, such as the United States (US), the United Kingdom (UK), and Australia, can generate sufficient tax revenue to fund their respective governments' activities [4]. For instance, the tax proportion in the UK and Australia from 2008 to 2017 was 32.53 percent and 29.73 percent, respectively¹. Improved tax compliance amplifies the revenues avail-

able for supporting public services without raising the present tax burden on complying taxpayers.

However, there is a tax noncompliance behavior with tax obligations in developing countries, especially in sub-Saharan African countries, which reduces the ability to generate the desired amount of money and results in budget deficits Ahlerup et al. [5]. As it does in some other developing nations, non-compliance is a serious challenge slackening income tax administration and tax revenue performance in Ethiopia [6].

Despite the various tax reforms undertaken by the Ethiopian government to increase tax revenue over the years, prior statistical evidence has proven that the contribution of income taxes to the government's total revenue remained consistently low and is relatively shrinking. Ethiopia has a low tax ratio compared to average sub-Saharan African countries and other low-income countries (like Mozambique, Congo Republic, Cape Verde, and Liberia).

The Ethiopian income tax and tax administration laws approved in 2016 aimed at improving tax collection, broadening

¹ Revenue Statistics - OECD countries: Comparative tables. 2020. <https://stats.oecd.org/index.aspx?DataSetCode=REV>

the tax base, and setting up a more efficient tax system overall. Some progress has been achieved to date although much more remains to be done. Reforms have strengthened integrity and enforcement, with significant improvements in taxpayers' assistance and service. However, taxpayer compliance improvements are still slow. For example, growth and transformation plan II from 2016 to 2021, aim to increase tax to gross domestic product (GDP) from 13.3 percent in 2014/15 to 17.2 percent of GDP by 2019/20. However, the tax to GDP ratio has been declining over time till 2020. According to, the International monetary fund country report, Ethiopia's tax to GDP ratio was declining from 13.3% of gross domestic product (GDP) in 2015 to 11.6% of GDP in 2020 below other low-income countries². This is why the tax compliance attitude topic is an important agenda in Ethiopia and need an examination.

Tax compliance has been given a big emphasis by researchers in many countries around the globe because of increasing non-compliance especially tax evasion and its consequences on the capacity of the government in raising public revenue [7].

In Ethiopia, previously scant research has been done on tax compliance from the business income taxpayer's perspective. Some of these are Tehulu & Dinberu [8] examined determinants of tax compliance behavior in Ethiopia: the case of Bahir Dar City, perception of government spending; perception of equity and fairness of the tax system; penalties; and referral group are factors that affect tax compliance. Deyganto [9] did a study on Factors influencing taxpayers' voluntary compliance attitude with the tax system: Evidence from Gedeo zone of Southern Ethiopia, tax knowledge, simplicity of tax system, probability of being audited, and perception of tax rate were found to be key factors influencing taxpayers' voluntary compliance attitude.

And also, a few studies were conducted on rental income taxpayers' com-

pliance in Ethiopia, such as Vadde & Gundarapu [10] conducted a study on factors that influence rental taxpayer's compliance with the tax system: an empirical study of Mekelle city, Ethiopia, and conclude that intentional tax avoidance (presence of dishonest taxpayers), lack of knowledge and awareness taxpayers were found to be the major factors for tax compliance issues. Geremew [11] studied the factors affecting rental income taxpayer's compliance with the tax system: A case of Hawassa City Administration, Ethiopia, Financial constraints, referent group influences, awareness of taxpayers, perception of tax fairness, understatement of income, educational status, absence of government incentives, trust in tax assessment and collection procedure, and rental tax audit were significant factors that determine tax compliance.

However, those studies used descriptive and multiple linear regression models as the data analysis method. While reviewing the related literature, the conclusions of many researchers in different parts of Ethiopia are inconsistent, as are the findings of earlier studies. In one study, some variables are significant, but in another, they are not. This grabbed the attention of the researchers, who decided to look into it more. In addition, no study had been done in the Afar regional state of Ethiopia to examine the magnitude of the factors that determine a rental income taxpayer's compliance status so far.

The main purpose of the study aimed to examine the key determinants of rental income taxpayers' compliance behavior with the tax system in the Afar Region state by using an ordered logit model.

In line with the above general purpose, this study has the following *specific purpose*:

- 1) To investigate how economic factors, such as tax rate, perception of government spending, and penalty rate, affect tax compliance.

- 2) To see the effect of institutional factors like organizational strength of tax authority, simplicity of tax system, and probability of detection of evasion on tax compliance.

² <https://www.imf.org/en/Countries/ETH>

3) To examine the influence of social factors, perceptions on equity and fairness of tax system, and peer influences on compliance behavior of tax system.

4) To identify the effect of individual factors, such as tax knowledge and awareness on the compliance attitudes of taxpayers in the region.

To address the objective, this study pointed out the following hypothesis, the validity of which will be confirmed or refuted:

H1: There is a negative significant relationship between high tax rates and tax compliance.

H2: There is a positive significant relationship between taxpayers' perceptions of government spending and tax compliance in the Afar regional state.

H3: Penalty rate has a significant and positive relationship with tax compliance.

H4: There is a significant positive relationship between organizational strength of tax authority and tax compliance.

H5: Simplicity of the tax system has a positive and significant relationship with tax compliance.

H6: There is a positive significant relationship between the probability of detection of evasion and tax compliance.

H7: There is a positive significant relationship between the perceived fairness of the tax system and tax compliance of rental income taxpayers.

H8: The influence of the reference group is a negative and significant relationship with tax compliance.

H9: There is a positive significant relationship between tax knowledge and tax compliance.

2. Literature review

2.1. The concept of tax compliance

Tax compliance is defined as fulfilling reporting requirements, which means that taxpayers file all required tax returns on time and accurately report tax liability in line with the Internal Revenue Code, regulations, and court decisions applicable at the time the return is filed [12].

Palil & Mustaph [13] offered an alternative definition, and described tax compliance as the willingness of taxpayers to

register for tax purposes, file tax returns on the due date, report accurate tax liabilities and pay all tax liabilities within the stipulated period without having to wait for follow-up actions from the tax authority. In general, compliance means behaving in conformity with the law, while non-compliance means breaking the law. Based on the aforementioned definitions, tax compliance can be defined as taxpayers' intention or readiness to act in line with the tax law, as well as their voluntary endeavor to pay their tax liability on a timely basis.

2.2. Determinants of tax compliance

In this section, we are trying to review determinants of tax compliance with the tax system. Different factors may influence the tax compliance behavior of Ethiopian taxpayers. Even though, such factors do have not equal influences and advantages among different places and taxpayers. This indicates that the importance of a certain variable in one place at a certain time may not necessarily be a significant factor in other places even in the same place after some time.

As Loo et al. [14] describes a comprehensive description of the factors that determine tax compliance splitting as economic factors (tax rate, level of income, probability of being audited, and perception of government spending), institutional factors (simplicity of tax system, the organizational strength of tax authority, and change in government policy), social factors (perception on equity and fairness of tax system and peer influence), individual factors (tax knowledge, personal financial constraints) and demographic factors (age, gender, level of education, marital status and occupation).

2.2.1. Economic factors

Engagements that are tied to the cost and benefits of doing the activities are known as economic factors that influence tax compliance such as tax rates, perceptions of government spending, and penalty rates [15].

Tax rate refers to the tax amount charged on taxable items and paid by taxpayers as stipulated by tax law [16].

Varied experts discovered different outcomes when it came to the effect of the tax rate on compliance.

Ottone et al. [17] state that higher tax rates encourage taxpayers to evade and avoid tax. This suggests that a tax rate that is viewed as high, unjust, and unfair deters taxpayers from adhering to the tax laws and regulations. On other hand, Adimassu & Jerene [18] depicted that tax compliance increases with a heavy tax rate. Contrarily, Assfaw & Sebhat [19] concluded that taxpayers' decision either to comply or not regardless of tax rates. These results show that, due to several contradictory results, the impact of tax rates on tax compliance is still unclear and debatable in different parts of Ethiopia, even in the same tax structure.

Particularly those who pay high tax rates will be eager in how the government spends their money, in terms of how taxpayers perceive government expenditure. Taxpayers are more likely to pay their fair share of taxes if they see the government using tax dollars wisely to fund essential services like public transportation, health care, and education. However, if they perceive that the government is overspending on items that they believe are unnecessary or unhelpful to the general populace, they may feel betrayed and try to avoid paying their fair share. Jayawardane & Low [20] state that taxpayers pay their taxes honestly if they get valuable public services in exchange. In opposite to this, Engida & Baisa [6] discovered that perception of government spending did not significantly impact taxpayers' compliance.

In terms of penalty rate, a penalty is money paid to government authority as a punishment for a crime or other offense. Scholars' findings about the effect of penalty rates on tax compliance are inconsistent. For instance, Ahmed & Kedir [21] state that the greater the penalty discourages the potential of tax evasion, that is when taxpayers perceived that there is a high penalty rate for any non-compliance the level of non-compliance will decrease. On the contrary, Adimassu & Jerene [18] originate penalty rate did not significantly correlate with tax compliance.

In conclusion, the outcomes of previous studies show that there is no clear line between penalty rate and tax compliance.

2.2.2. Institutional factor

Although taxpayers' compliance behavior is determined by their economic concerns, evidence reveals that institutional variables like organizational strength of tax authority, simplicity of tax system, and probability of detection of evasion also have a substantial impact on taxpayers' compliance behavior.

Tax compliance places the government and the tax authority as the primary parties responsible for administering the tax system to reduce the tax gap and improve voluntary compliance [22]. Efficiency and effectiveness of the authority in improving the tax assessment and procedures of tax collection, the building of awareness, and enforcement of the tax law influence positively the voluntary tax compliance behavior of taxpayers [23]. Besides, Richardson [24] also stated that the role of a government has a significant positive impact on determining attitudes toward tax. But, the studies of Deyganto [9] on determinants of tax compliance behavior of taxpayers indicated that the roles of the tax authority were not significantly correlated with tax compliance.

The tax system ought to be as easy as possible for the rationale that taxpayers are from varied backgrounds, with totally different levels of education, earning levels, various cultures, and different tax awareness. In serving taxpayers to complete the tax returns accurately, the tax authority needs to have a simple, but sufficient, tax return [21]. Taxpayers' levels of understanding of tax laws are positively correlated to a significant degree with their tax compliance decisions [22]. Most of the time taxpayers not only find it difficult to file their tax returns correctly but also perceive tax law complexity and ambiguity as causes of tax non-compliance [20].

A tax audit can play a major role in improving tax administration and overall taxpayer compliance by impacting taxpayer behavior. The contribution of tax

audits to improving taxpayer compliance is significant among other measures taken by revenue authorities of the country [25]. Admasu & Shallo [26] conclude that the likelihood of tax evasion discovery was the significant determinant that affected the level of tax compliance. This suggests that the level of tax compliance will improve as the likelihood of detection rises. On other hand, Adimassu & Jerene [18] stated that a high probability of being detected would potentially decrease compliance creating a negative association. This means that an effective audit induces taxpayers to overclaim deductions rather than encouraging them to correctly report actual income. Contrariwise, Tehulu & Dinberu [8] conclude that the probability of detection did not significantly affect tax compliance.

These findings demonstrate that, due to a variety of inconsistencies, the effect of tax rates on tax compliance in various regions of the nation within the same tax system is still disputed and unclear.

2.2.3. Social factors

From a sociological perspective, variables impacting tax compliance have to do with taxpayers' inclination to uphold the law in response to other people's behavior and their social setting [27].

Besides, Kirchler et al. [28] state that social factors should be viewed in a wider logic than a social viewpoint; this contains the psychology of the taxpayers. These factors include perceptions of equity and fairness, changes to current government policy, and referent groups.

Perceptions of equity or fairness in the tax system are principles of the tax system, which can be observed through three-dimensional views; horizontal equity (people with identical income should pay an equal amount of taxes), vertical equity (taxes paid increase with the amount of taxable revenue) and Exchange Equity (expectation the same portion of public service from the government for paying tax Torgler [27]. The perception of taxpayers toward the fairness of the tax system also has an impact on tax compliance status [24]. Ahmed & Kedir [21] depicted that, if taxpayers believe their

tax burden is more than that of other persons in their income group, their tax compliance probably decreases.

Decisions either to evade or not to evade tax sometimes are influenced by family members or friends [29]. Torgler [30] concludes that citizens' perception of how compliant other citizens are has a strong impact on their willingness to comply. Similarly, Inasius [31] portrayed that influence from family and friends significantly affects taxpayers' compliance behavior. This means if a taxpayer prefers to be compliant with tax law, then the tendency to commit tax evasion is lower, and vice versa. Therefore, the influence of referent groups on decision-making is presumably significant, especially when it comes to monetary considerations and legal compliance. On contrary, Deyganto [9] referent group has no significant influence on tax compliance attitude.

2.2.4. Individual factors

Several factors may influence a taxpayer's decision on tax compliance, but the taxpayer ultimately has the power to decide. The choice of whether to comply with tax laws is mostly up to the taxpayer [32]. factors like personal financial constraints, tax knowledge, and awareness of taxpayers have a significant impact on taxpayer compliance status.

Numerous studies have evaluated the impact of awareness and knowledge on compliance levels. Tax knowledge is correlated with a taxpayer's capacity to comprehend tax law and rules and willingness to abide by them. Through education, the taxpayer learns about their rights, duties, and tax-payment processes as well as the repercussions of not obeying [33]. Mutai and Omwono [34] state that tax compliance would increase with higher tax knowledge. This argues that raising taxpayers' knowledge of tax laws and regulations through formal and informal education will have a favorable effect on taxpayer awareness to pay taxes. Whereas, Palil [35] claimed that as taxpayers get enough tax knowledge, they will use this knowledge to find loopholes that can help them escape from paying their tax liability.

3. Methods

3.1. Description of the study area

The Afar region is a regional state in northeastern Ethiopia and the homeland of the Afar people. Its capital is the planned city of samara, which lies on the paved Awash-Assab highway. Afar Regional State has a population of 1,812,002, among these 991,000 men and 821,002 women; urban inhabitants number 346,000 of the population, a further 1,466,000 were pastoralists [36].

3.2. Source of data and method of collection

In this study to get complete, accurate, and sufficient data both primary and secondary sources of data were used. Primary data were collected by distributing questionnaires to the taxpayers. Secondary data were obtained from published and unpublished sources.

3.3. Sample size and sampling procedure

In this study, a multi-stage sampling method was used. In the first stage, out of thirty-four districts, two towns (Awash and Aba'ala) and one city administration (Samara-logia) were selected purposively because registered rental income taxpayers are large in those areas. In the second stage, the sample size for each selected area was determined proportionally to the number of rental income taxpayers within each town and city.

Finally, 404 business house rental income taxpayers were selected based on the random sampling method. In this study, the sample size is determined from the total population by using Yamane [39] formula as follows by considering a sample error of 4%.

$$n = \frac{N}{(1 + N(e)^2)} = \frac{1144}{(1 + 1142(0.04)^2)} = 404.$$

3.4. Model

In this study ordered logistic estimation was applied to measure the level of tax compliance in the study area. Tax compliance was measured by using hypothetical questions adopted and developed

with some modifications from previous similar studies such as Palil [35], and Engida & Baisa [6] in which respondents were asked to rate each question by using the Likert scale (ranges from one to five) from strongly disagree to strongly agree.

The average score of all items was taken as an index for tax compliance status. Based on this score, taxpayers were categorized into three levels of compliance: low, medium, and high. Tax compliance level, the observed ordinal variable, takes on values 0 through *m* according to the following scheme:

$$Y_i = j \Leftrightarrow \mu_j - 1 < Y_i^* \leq \mu_j,$$

where $j = 0, \dots, m$.

Accordingly, the probability of each tax compliance status (Low- y_1 , medium- y_2 , and high- y_3) will be computed as follows:

$$y_1 = 1 \text{ if } y_i^* \leq u_1,$$

$$y_2 = \text{if } u_1 < y_i^* \leq u_2,$$

$$y_3 = \text{if } y_i^* > u_2.$$

Therefore, the model can be specified as follows:

$$\begin{aligned} TCOMPL_i = & \beta_0 + \beta_1 TAXKNOW + \\ & + \beta_2 PRODET + \beta_3 PENRATE + \\ & + \beta_4 SIMPL + \beta_5 ORGSTR + \beta_6 FAIR + (1) \\ & + \beta_7 PERGOVS + \beta_8 TAXRATE + \\ & + \beta_9 PEERINF + e_i. \end{aligned}$$

4. Results

4.1. Study of correlation between variables

Table 2 depicts the association between the variables used in this study. According to the spearman correlation result, all independent variables except for tax knowledge and penalty rate were significantly correlated with tax compliance status. The highest correlation occurred between compliance and tax rate ($r = -0.5687$) followed by fairness of tax system ($r = 0.4092$), perception toward government spending ($r = 0.3846$), peer influences ($r = -0.3498$), probability of detection ($r = 0.2664$), simplicity of tax system ($r = 0.1802$) and organizational tax authority ($r = 0.1346$).

According to Spearman correlation result, it was suggested that probability of detection, peer influence, tax rate, perception of government spending, organizational strength of the tax authority, fairness of tax system, and simplicity of the tax system were the most significant determinants of business house rental income taxpayer’s compliance status in the Afar region. According to Hair et al. [38], a correlation coefficient of greater than 0.7 indicates substantial collinearity among independent variables.

Table 2 indicates that there is no problem with multicollinearity in this study.

4.2. Determinants of rental income taxpayer’s compliance status

As depicted in Table 3, ordered logistic regression was conducted for all variables and indicates tax knowledge, probability of detection of tax evasion, tax rate, perceptions of taxpayers to government spending, organizational strength of tax authority, fairness of tax system, and simplicity of tax system were found to be statistically significant factors that determine tax compliance of business house rental income taxpayers.

Specifically, the robust ordered logit regression results show the existence of a statistically significant positive relation between tax compliance behavior and tax knowledge. In terms of marginal effects, other aspects held constant as one point increases the taxpayer’s knowledge and awareness of the tax system shows a decrease in the likelihood of the behavior that compliance status occurs low (7.6%), even though it also shows an increase in the likelihood of the behavior that compliance status occurs medium (6.3%) and high (1.2%) (see Table 3).

Regarding the probability of detection of evasion and compliance behavior, the results of ordered logit regression show a positive and statistically significant association. The marginal effect also depicts that being other factors held constant, in a one-level increase the probability of detection of evasion is likely to reduce the probability of the behavior that compliance status occurs low (16.4%), This is also likely to increase the probability of the behavior that compliance status occurs medium (13.7%) and high (2.7%).

Table 1

Description of Variables			
Variable	Symbol	Measurement	Expectation sign/ hypothesis
Dependent variable			
Tax compliance Status	TCOMPS	(1,2,3) Ordinal	
Explanatory variable			
Tax rate	TAXRATE	(1-5 likert scale)	- (high tax rate, low compliance)
Probability of detection	PRODET	(1-5 likert scale)	+ (high probability, high compliance)
Penalty rate	PENRATE	(1-5 likert scale)	+ (high penalty, High Compliance)
Simplicity of tax system	SIMPL	(1-5 likert scale)	+ (very simple tax system, high compliance)
Organizational strength of tax authority	ORGSTR	(1-5 likert scale)	+ (strong tax authority, High Compliance)
fairness of tax system	FAIR	(1-5 likert scale)	+ (good perception, high compliance)
Perception to government spending	PERGOVS	(1-5 likert scale)	+ (good perception, high compliance)
Peer influence	PEERINF	(1-5 Likert scale)	- (high influence, low compliance)
Tax knowledge	TAXKNOW	(1-5 likert scale)	+ (high tax knowledge, high compliance)

Note: “-” negatives and “+” positive
 Source: Own computation, 2022

Table 2

Spearman Correlations Matrix

	TCOMPS	TAXKNOW	PENRATE	PRODET	PEERINF	TAXRATE	PERGOVS	ORGSTR	FAIR	SIMPL
1. TCOMPS	1.0000									
2. TAXKNOW	0.0465	1.0000								
3. PENRATE	0.0020	-0.1379**	1.0000							
4. PRODET	0.2664**	0.2195**	-0.0267	1.0000						
5. PEERINF	-0.3498**	-0.0188	0.1872**	-0.3089**	1.0000					
6. TAXRATE	-0.5687**	0.1114*	0.0621	-0.0385	0.4383**	1.0000				
7. PERGOVS	0.3846**	0.2221**	-0.0912	0.1787**	-0.1827**	-0.2077**	1.0000			
8. ORGSTR	0.1346*	0.1384**	-0.1268*	0.0902	-0.0368	0.0899	0.1817**	1.000		
9. AIR	0.4092**	-0.2654**	0.1839**	0.0927	-0.2554**	-0.4919**	-0.0270	-0.0495	1.0000	
10. SIMPL	0.1802**	-0.2549**	0.2133**	-0.1251*	-0.0067	-0.2486**	-0.2111**	-0.1312**	0.3824**	1.0000

Note: ** Correlation at 1 % level of significance *correlation at 5%level of significance

Table 3

Ordered logistic result on determinants of rental income taxpayers' compliance

TCOMPL	Coef.	Robust Std. Err.	Z	Marginal Effects		
				Low	Medium	High
TAXKNOW	0.3533238*	0.1413064	2.50	-0.076147	0.0635533	0.0125937
PENRATE	0.196118	0.1916769	1.02	-0.0422666	0.0352763	0.0069903
PRODET	-7649486**	0.1997547	3.83	-0.11648588	0.1375934	0.0272654
PEERINF	-0.2431375	0.2066341	-1.18	0.0524001	-0.0437338	-0.0086663
TAXRATE	-1.112442**	0.1527199	-7.28	0.2397493	-0.200098	-0.0396513
PERGOVS	1.435832**	0.2345215	6.12	-0.3094451	0.258267	0.051178
ORGSTR	0.675029**	0.253221	2.67	-0.1454796	0.1214193	0.0240604
FAIR	0.8108385**	0.2098837	3.86	-0.1747488	0.1458477	0.0289011
SIMPL	0.5898819**	0.1388865	4.25	-0.1271291	0.1061036	0.0210254
/cut 1	9.923501	1.524241				
/cut 2	13.96234	1.649864				

Number of obs = 404

Wald chi2(9) = 191.96

Prob > chi2 = 0.0000

Pseudo R2 = 0.3368

Log pseudo likelihood = -262.70796

Note: ** Correlation at 1 % level of significance *correlation at 5%level of significance

Source: survey results and own computation, 2022

Regarding the tax rate and tax compliance status, the results of ordered logit regression show a negative and statistically significant association. The marginal effects indicate that a one-point increase in the tax rate is likely to increase the probability of the behavior that compliance status occurs low (24%), This is also likely to decrease the probability of the behavior that tax compliance status occurs medium (20%) and (high 4%).

The correlation between the perception of taxpayers toward government spending and compliance attitude is also investigated. The results of ordered logit regression show the existence of a positive and statistically significant correlation between the two. In terms of marginal effects, as Table 3 shows, a one-point increase in the positive perception of taxpayers toward government spending shows a decrease in the likelihood of the attitude that compliance status occurs low (30.9%); it also shows an increase in the likelihood of the attitude that tax compliance status occurs medium (25%) and high (5%) (see Table 3).

The ordered logit regression results show the existence of a statistically significant positive relation between tax compliance behavior and organizational strength of tax authority. The marginal effect indicated that other factors remain constant, an increase in the organizational strength of tax authority (Specifically, in tax assessment and collection, awareness creation, providing information, and enforcement action) by one point, is likely to result in a decrease in the probability of the behavior that compliance status being low (14.5%), and an increase in the view that compliance status occurs medium (12.1%) and high (2.4%).

Perception of taxpayers about the fairness and equity of the tax system and tax compliance are found to have a statistically significant positive relation, as revealed in the ordered logit regression estimates. This denoted that being other factors held constant, A one-point increase in the perception of fairness and equity of the tax system is likely to reduce the probability of the behavior that compliance status oc-

curs low (17.4%), This is also likely to increase the probability of the behavior that compliance status occurs medium (14.5%) and high (2.9%).

The finding of this study concerning the simplicity of the tax system has a positive and significant relationship with tax compliance behavior. In terms of marginal effects, other issues held constant, An increase in the level of simplicity of the tax system (the clarity of tax law and regulation to understand by the taxpayers easily) is likely to reduce the probability of the behavior of compliance status occurs low (12.7%), This is also likely to increase the probability of the behavior that compliance status occurs medium (10.6%) and high (2.1%) (see Table 3).

5. Discussions of Results

This paper has examined the correlation between compliance behavior and its determining factors, as identified in the literature review section. Using data obtained from a survey of business house rental income taxpayers in the Afar region, we have analyzed the association between compliance behavior and different explanatory variables, such as tax knowledge, penalty rate, probability of detection of evasion, peer influence (referent group), tax rate, perception of government spending, organizational strength of the tax authority, fairness of the tax system, and simplicity of the tax system. The results of ordered logit regression revealed a statistically significant correlation between compliance attitude and most of the factors considered in the analysis.

Hypothesis *H9* predicted that there is a positive significant relationship between tax knowledge and tax compliance. The findings of ordered logit regression indicate a positive and significant association between tax knowledge and tax compliance. Hence, *H9* is confirmed. This revealed that increased taxpayer awareness and understanding might enhance tax compliance, and diminish the desire to evade the law. This finding is concurrent with the findings of Biru [39], Machgu & Amayi [40], Adimassu & Jerene [18], Manchilot [22], and Assfaw & Sebhat [19].

Hypothesis *H3* is not confirmed, as the findings of this study indicated a statistically insignificant association between penalty rate and tax compliance.

Hypothesis *H6* predicted that there is a significant positive relationship between the probability of detection of evasion and tax compliance. The results of ordered logit regression show the existence of a positive and statistically significant correlation between the two. Thus, *H6* is confirmed. This implies that taxpayers comply with taxation for the reason that they fear may be caught by a tax audit. This is in line with the findings of Biru [39], Deyganto [9], Ahmed & Kedir [21], and Tilahun [22].

Hypothesis *H8* posited that the influence of the reference group has a negative and significant relationship with tax compliance. However, the results of this study indicate an insignificant association between the two. Thus, *H8* is not confirmed.

Hypothesis *H1* posited that there is a significant negative relationship between the tax rate imposed by rental income taxpayers and their compliance behavior. The results of the regression analyses undertaken indicate significant negative relationships between tax rate and tax compliance. Thus, *H1* is confirmed. Findings showed that a tax rate that is perceived as heavy, unfair, and inequitable they do not fulfill its tax obligation. This finding is in line with the findings Hai & See [41], Mas'ud et al. [42], Ottone et al. [17], and Tilahun [22].

Hypothesis *H2* predicted that there is a positive relationship between perceptions of taxpayers to government spending and tax compliance. The results of the study show that the perception of taxpayers toward government spending was found that it has a positive impact on tax compliance. Thus, *H2* is confirmed. This finding suggests that, if taxpayers perceived that the government is spending the national revenue wisely for basic facilities, such as education, health, safety, and public transportation, it is assumed that compliance status would be improved. This finding is in tandem with the finding of Ali et al. [43], Ahmed & Kedir [21], Adimassu & Jerene [18], and Assfaw & Sebhat [19].

Hypothesis *H4* is well confirmed, as the findings indicated that the organizational strength of tax authority had a significant positive relationship with tax compliance. This signifies that if the tax authority is effective in enhancing providing services, raising awareness, enforcing the law, and providing other information about taxes, taxpayers will desire to comply with the tax system. This result is similar to the findings of Mehari [44], and Tilahun [22].

Hypothesis *H7* is well confirmed, as the findings indicated that the fairness of the tax system was found that it has a positive significant association with tax compliance. The outcome also implies that, if taxpayers believe that their tax burden is equivalent to that of other taxpayers in their income group, they are more likely to comply with tax laws. Our findings agree with the results of previous research by Gberegbe & Umoren [45], Tehulu & Dinberu [8], Ahmed & Kedir [21], and Adimassu & Jerene [18].

Hypothesis *H5* posited that the simplicity of the tax system and tax compliance has a positive and statistically significant association. The results show that the simplicity of the tax system was found to have a positive significant impact on compliance behavior. Hence, *H5* is confirmed. This means that if the tax system is easy to comprehend for taxpayers, it will encourage them to obey the tax law. These results are consistent with the findings of other empirical studies such as Stephen [46], Assfaw & Sebhat [19], and Tilahun [22]. On other hand, Jayawardane & Low [20] conclude complexity of the tax system upsurges the possibility of misreporting the tax burden.

6. Conclusions

This article aimed to examine the major determinants of business house rental income taxpayers' compliance with the tax system in the Afar region. Based on a survey conducted in the Afar region selected woredas, an attempt was made to examine the factors that determine tax compliance. The ordered logit regression result showed that tax compliance was positively affected

by tax knowledge, probability of detection, perception of government spending, organizational strength of tax authority, fairness of tax system, and simplicity of tax system and negatively influenced by the tax rate in a regional state of Afar.

The findings of this study revealed that if taxpayers know the basic concepts of taxation, the tax system is simple for taxpayers to understand, which in turn will enhance compliance.

The taxpayers who perceived government spends national revenue wisely on essential goods and services, their tax burden is fair and equitable to that of others in their income group, which will encourage them to obey the tax law. Besides, when a tax rate is considered as being severe, unfair, or unequal, it discourages them from complying with the tax law. When the tax authorities are capable of providing quality services, the chances of being caught for evasion are high, taxpayers will desire to conform to the law.

Based on our finding it is recommended that tax authorities and other responsible bodies emphasize tax education and awareness, including the purpose of tax

collection, how it is computed and what things it is invested, and the benefits of tax fees through tax education movement and mass media, and simplify filing tax returns and tax forms, and tax calculation.

The tax authority needs to be strong in the tax assessment and procedures of tax collection, awareness creation, enforcement of the tax law, and providing other information, increase the number or frequency of audits, primarily upon new and immature taxpayers, as this will surely teach them how to be compliant if authorities check their very first tax file.

The government must establish a dubious, accountable, and transparent institution, and it must tell the public how and why it invests taxpayer money, their tax liability should be based on their ability to pay, and should take into account the numbers of taxpayers' families, expenditures, and other factors.

Further, with the help of this finding, further study should be conducted by incorporating all rental income taxpayers at a national level by including other tax compliance determinant variables that were not incorporated in this study.

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Exploring Tax Decision Factors: A Perspective from North Indian Tax Practitioners

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ABSTRACT

Taxation policy constitutes a very important position in Government's focus on macro-economic management and development of the state. The lack of adequate financial resources has made economies especially developing ones to focus upon tax performance more vigorously. Compliance is not everything about enforcement for tax collections alone; it carries attempts of modern day states to build an obedient and self-policing society. In this context, tax practitioners play a crucial role in creating the same. Tax practitioners act as fundamental allies of taxpayers while they also carry a legal obligation to obey tax laws when professionally advising their clients. The present study attempts to explore the underlying factors behind tax professionals' ethics based decision making process. For the purpose of statistical analysis, a structured questionnaire was employed building upon a four-dimensional framework of tax ethics. The survey data has been collected from a sample of 316 individual tax practitioners from three major provinces of North India – Punjab, Haryana & Himachal Pradesh using non-probability snowball sampling technique during July-Dec. 2021. The statistical results revealed tax practitioners' ethics is indeed reflected by the postulated framework. Three of the postulated hypothesis namely stakeholder view, Machiavellian scale & compliance costs were found as significantly influencing tax ethics thereby signifying a relationship between practitioners ethics and these dimensions. The survey findings carry important managerial implications for improving the responsiveness of tax revenue performance under dynamic economic settings.

KEYWORDS

public finance, tax ethics, fiscal policy, tax compliance, tax morale, income tax, tax practitioners

JEL E64; H24; H26; O50

УДК 336.22

Изучение факторов принятия налоговых решений: точка зрения налоговых консультантов Северной Индии

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АННОТАЦИЯ

Налоговая политика занимает очень важное место в фокусе внимания правительства в макроэкономическом управлении и развитии государства. Нехватка адекватных финансовых ресурсов вынуждает страны, особенно развивающиеся, уделять больше внимания налоговому консультированию. Соблюдение налогового законодательства – это не только правоприменение в отношении сбора налогов. Этот процесс несет в себе попытки современных государств построить послушное и самоконтролируемое общество. В этом контексте налоговые консультанты играют решающую роль в формировании данного процесса.

Налоговые консультанты выступают в качестве фундаментальных союзников налогоплательщиков, а также несут юридическое обязательство соблюдать налоговое законодательство при профессиональном консультировании своих клиентов. В настоящем исследовании делается попытка изучить основные факторы, лежащие в основе процесса принятия решений, основанного на этике налоговых консультантов. В целях статистического анализа был использован структурированный вопросник, основанный на четырехмерной системе налоговой этики. Данные опроса были собраны из выборки 316 индивидуальных налоговых консультантов из трех крупных провинций Северной Индии – Пенджаб, Харьяна и Химачал-Прадеш, с использованием метода невероятностного «снежного кома» в период с июля по декабрь 2021 г. Статистические результаты показали, что этика налоговых консультантов действительно отражена в постулируемой основе. Было обнаружено, что три из четырех тестируемых гипотез, а именно мнение заинтересованных сторон, шкала Макиавелли и издержки на соблюдение требований, значительно влияют на налоговую этику, что указывает на связь между этикой консультантов и этими аспектами. Результаты опроса несут важные управленческие последствия для повышения оперативности налоговых поступлений в динамичных экономических условиях.

КЛЮЧЕВЫЕ СЛОВА

государственные финансы, налоговая этика, фискальная политика, соблюдение налогового законодательства, налоговая мораль, подоходный налог, налоговые консультанты

1. Introduction

Taxation is considered as the principal mode of revenue generation for governments around the world. However, the problem of tax non-compliance and its evasion is as old as taxes themselves. Characterizing and explaining the observed patterns of tax non-compliance and ultimately finding ways to reduce it are important to every nation around the world [1]. Although non-compliance can be attributed to a number of factors, generally it is attributed to the willful attempts to evade tax payments.

Individual income tax is one such important component of tax revenue that involves issues concerning problems of non-compliance. Tax compliance involves a complex interaction of deterrence tools and non-economic (psychological) contract between taxpayers and authorities [2; 3]. Franzoni [4] delineated the multiplicity of elements leading to non-compliance and concluded that not only enforcement, but social and moral attitude of people also tend to play a significant impact on tax compliance. The level of compliance has been observed to be influenced by non-economic factors with the extent of income tax evasion being mainly influenced by economic factors [5].

The concept of self-assessment compliance system, which has been adopted worldwide, calls for certain responsibilities on part of tax practitioners as well. When taxpayers are confused over disclosures to be reported – on account of complexities in tax law, sheer ignorance or due to existence of vague provisions and their discretionary interpretations – they resort to seek “professional advice”. Tax practitioners therefore hold a prominent place in the administration of tax system. There is no statutory description of what would constitute such professionals. They may take the form of tax accountants, certified tax professionals, tax lawyers or tax return preparers (TRPs) as well. Hence, the present study refers them as “Tax Practitioners” imbibing all such varied possibilities.

Tax practitioners act as fundamental allies of taxpayers while at the same time they carry a legal obligation to obey tax laws when professionally advising their clients [6–8]. Clients seek their assistance for removing ambiguity or seeking expert opinion on their tax management affairs. They seek varied expectations from tax practitioners in relation to their compliance problem. Their importance can be gauged from the fact that certain provisions in the Indian Income Tax Act, 1961

mandate furnishing of Tax Audit Certificates / Audit Reports for certain categories of assesses duly validated by such tax practitioners for compliance purposes.

Prior studies have noted that personal beliefs of ethical conduct and socio-economic environment indeed affect tax professionals' decisions [6; 10]. Alm & Torgler [11] argue that individuals are influenced not only by traditional economic dimensions, but tax ethics also significantly contribute in their tax compliance decisions. Therefore, it is not viable to understand tax compliance decision process completely without incorporating the "ethical" dimension into the discussion.

The study of tax ethics determinants among tax practitioners has been touched upon only by a limited number of studies empirically [12; 13]. Moreover, majority of previous attempts like Blanthorne & Kaplan [14], Bobek & Hatfield [15], Henderson & Kaplan [16], Shaub et al. [17] have focused upon only individual differences in personality traits such as ethical orientation (as outlined in [13]) and miss out equivalent important construct of broader "socioeconomic attitudes such as belief in the importance of corporate ethics and social responsibility".

"The pervasiveness of practitioner representation combined with the influence that practitioners have on reporting positions has profound implications for the management of the tax system. This makes tax practitioners and their preparation practices of considerable interest to tax authorities" [9]. Hence, it becomes imperative to understand the drivers behind compliance choices of tax practitioners to ensure their obligation towards tax law framework as well as their clients in totality. The intent for the present study is to achieve such an informed understanding. Accordingly, the present study attempts to contribute by enlightening how the tax practitioners' perspective of ethical conduct and its determinants influence the tax compliance framework.

Although a perusal of literature holds the level of efforts being put in by abundant studies in examining the issue of tax evasion and compliance in a holistic man-

ner, what has been found as missing is an equally important domain of what defines the relationship between state and its subjects in the tax practitioners' context.

The purpose of the present study is to address the aforementioned gap with an attempt aimed at gaining better insights into the underlying structure of determinants behind tax compliance attitude framework among tax practitioners in India.

For the said purpose, a four-dimensional theoretical structure has been designed encompassing external socio-dynamics coupled with practitioners' internal motivation to compliance. Based on the research model (Figure 1 below), the following *hypothesis* are postulated:

1. Professional commitments influence tax ethics (**H1**: There is a significant relationship between stockholder view and tax ethics).

2. Societal responsibility influence tax ethics (**H2**: There is a significant relationship between stakeholder view and tax ethics).

3. Compliance costs influence tax ethics (**H3**: There is a significant relationship between non-compliance attitude and tax ethics).

4. Personality traits influence tax ethics (**H4**: There is a significant relationship between Machiavellian scale and tax ethics).

These hypotheses were elaborated in the succeeding discussion.

2. Background Literature & Hypothesis Framework

Empirical research suggests that individuals exhibit diverse behaviour under comparable situations. However, what still remains a mystery are the possible determinants behind such varying behavioural tendencies. A host of variables cast an impact over an individual's ethical perspective. Such variations are usually defined across two forms namely an economic perspective [1;18] to a behavioural, psychological or social perspective [19; 20].

The inspiration for the study has been inspired by Shafer et al. [13], Shafer & Simmons [21], Sharma et al. [22]. Marshall et al. [23] observed the perceived level of tax

ethics among the tax practitioners in western Australia related to the ethical environment in which they operate. Failure to make reasonable enquiries in case of inaccurate or improper documents followed by technical competence were found to be the high and frequently occurring ethical problem, whereas confidentiality in relation to client dealings followed by technical competence were observed as the most important ethical issues. Even et al. [24] held that improving the level of tax ethics is an important dynamic influencing the level of shadow economy and impacting tax compliance.

Sakurai & Braithwaite [25] identified the dimensions concerning Australian taxpayer's perception about their tax practitioners and found that a majority of Australian taxpayers were aware of the tax laws and looked for practitioners for guidance or expert support. A comparative analysis of ideal and currently engaged practitioners provided that the taxpayers looked for the ones that matched their objectives or needs and high on honesty attribute.

Benk et al. [26] investigated the tax fairness dimensions in Turkey. Through a sample survey of 180 tax professionals, six dimensions concerning tax fairness in Turkey were identified "namely general fairness, middle income earners tax share and tax burden, exchange with the government, tax rate structure, special provisions, tax system equality and inequality". Hence, both economic and non-economic factors influence tax compliance with non-economic factors like a more corrupt government or increased irregular payments besides efficiency of government spending and political freedom playing a vital role in determining level of tax compliance [9]. The four-dimensional hypothetical framework has been framed as under.

2.1. Professional Commitments & Tax Ethics

Tomasic & Pentony [27] critically evaluated the role played by tax professionals in Australia in supporting tax compliance and observed that the principal motivation behind paying taxes is fear and shame of publicly labeling as a "bludger" rather than a sense of community responsibility or patriotism. Moreover, tax professionals

reported certain issues like complexity in tax law, uncertainty associated and frequent changes in tax laws as the principal concerns facing tax compliance efforts.

Taxpayers seek help of tax advisors primarily due to uncertainty associated with the tax laws and associated administrative complexities rather than seeking tax burden reduction [28].

Muhrta & Ogundejí [29] conducted a survey of 160 tax professionals to examine the factors responsible for tax evasion in Nigeria. The study found tax evasion to be significantly influenced by complexity in tax structure, lack of trust in government regarding tax proceeds utilization, expected benefits with evasion and administrative issues.

H1: There is a significant relationship between stockholder view and tax ethics.

2.2. Societal Responsibility & Tax Ethics

Man is a social animal and enjoys both social rights as well as societal responsibilities. Such, social responsibilities of individuals also extend to their tax behavior. The crises that the world has repeatedly faced, both economic and social like the covid one recently has made economies think over the revaluation of the present principles of societal engagement based on achieving profits alone. Socially responsible behaviour is being seen as a means of furthering societal goals. Social responsibility, both individual as well as corporate one, tends to enhance transparency which brings in greater governance and compliance [23; 30; 31].

Zeng [32] illustrated the inverse relationship between corporate social responsibility and tax avoidance practices in an international setting. The study also noted that weak governance structures in countries tend to lead to avoidance incidences and governance act as proxies to the CSR in evaluating the impact of avoidance-social responsibility relationship.

David & Gallego [33] noted the interrelationship among corporate income tax and social responsibility framework within the European Union (EU). By evaluating the impact of economic and social decisions taken by corporate in relation

to corporate income tax, study found that adoption of the social responsibility improves accountability and positively contrive tax regime among EU countries.

H2: There is a significant relationship between stakeholder view and tax ethics.

2.3. Compliance Costs & Tax Ethics

People turn underground not to avoid the official tax burden, but to reduce the regulatory burden in terms of bureaucratic controls and corruption [34]. Tax evasion is considered more acceptable in cases where government is found to be corrupt as also when tax system is perceived to be unfair in treatment among people [8].

Whereas et al. [35] have noted that tax ethics across countries is indeed shaped by “socio demographic characteristics, personal financial experiences and political attitudes”. The fiscal management of the exchequer being one of the most important determinants across all sampled countries. Indeed, the role of financial condition was found to be moderating the relationship between perception of public governance quality and tax compliance behavior [36].

Studies have also found study found a significant role of individual’s financial satisfaction and trust in others in stimulating compliance behavior [37; 38].

H3: There is a significant relationship between non-compliance attitude and tax ethics.

2.4. Personality Traits & Tax Ethics

Leonardo & Martinez-Vazquez [39] analysed the factors shaping tax compliance attitude of people and noted that government organizations having interactions with individuals (in terms of public service delivery) significantly impact the level of tax ethics.

Even, studies like Alm & Torgler [40]; Bobek et al. [41]; Damayanti et al. [42]; Torgler [43] have noted that high level of social norms act as the principal reason for high tax compliance.

Green [44] analyzed the framework of a tax system in terms of ethical values like fairness and justice and concluded that while certain traditional solutions to tax issues may be relevant and effective in the short run, gaining fruitful insights into human

motivation (to pay taxes) and their social behavior will certainly contribute further to the long run. This dimension has been employed by Shafer et al. [13] using the connotation ‘ethical judgment’ interpreting it as a composite measure that incorporates both elements of relativism and moral equity.

H4: There is a significant relationship between Machiavellian scale and tax ethics.

3. Methodology

For the purpose of statistical analysis, a structured questionnaire was employed to elicit tax practitioners’ responsiveness towards tax ethics. The proposed structure builds upon a four-dimensional framework casting an impact on tax ethics based on Shafer et al. [13] & Sharma et al. [22; 46]. As a preliminary check, the three-step instrument development process comprising of “item generation, pre-testing cum item refinement, and scale validation phases” was performed to validate the conceptual framework [45; 46] (Figure 1).

A total of 44 variables encompassing stakeholder view, stockholder view, non-compliance attitude and Machiavellian scale dimensions were factor analysed to identify the underlying determinants for tax ethics. The stakeholder view, stockholder view and Machiavellian scale dimensions were derived from Shafer & Simmons [21], who have derived the same based upon Singhapakdi et al. [47] PRESOR’s Scale designed to “measure the perceived role of ethics and social responsibility” among organizational contexts, while the non-compliance attitude dimension was formulated from empirical literature review [22].

The research instrument was tested for content validity based upon a thorough discussion of the conceptual framework with 3 academicians and 5 tax practitioners working in the tax compliance domain. Based on the aforesaid discussions, a total of eight statements depicting vague posturing and not defining the domain explicitly were removed from the scale. The final survey instrument with 36 items was measured using a five-point Likert scale. The sample survey was conducted during the period: July-December 2021 (Table 1).

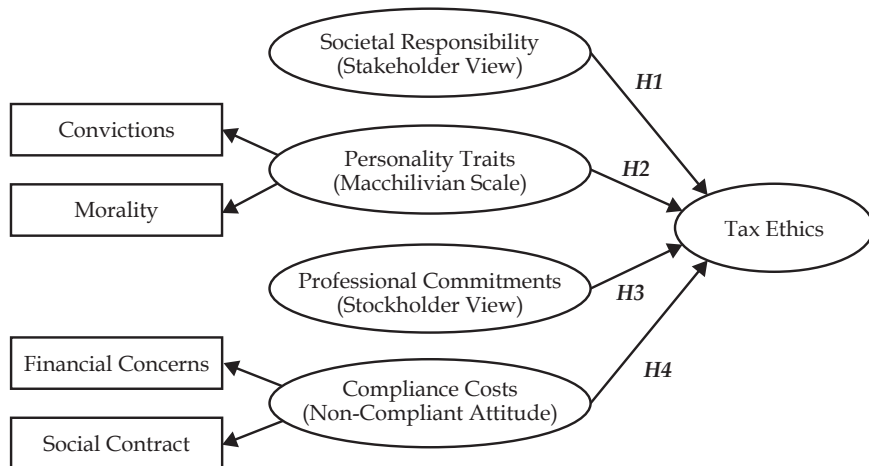


Figure 1. Research Model

Source: Theoretical framework based on previous literature

Table 1

Respondents Profiling		
	Per cent	Count Frequency
Gender		
Male	86.70	274
Female	13.30	42
Age		
20–30 yrs	44.94	142
30–40 yrs.	38.92	123
40–50 yrs.	16.14	51
Income		
< ₹ 2.5 lakh	04.11	13
₹ 2.5 – ₹ 5 lakh	30.70	97
₹ 5 – ₹ 10 lakh	46.84	148
> ₹ 10 lakh	18.35	58

Source: Survey data

The survey data has been collected out of a sample of 400 individual tax practitioners as survey respondents. Non-probability snowball sampling technique has been used to select the respondents since no official list of such tax practitioners registered across the sampled region was available in the public domain. To begin with, directories of chartered accountants and income tax practitioners that are published region wise were accessed.

From the said list, a proportionate number of tax professionals for each city (based on the data collected about indi-

vidual income-tax assesses filing tax returns in north-west region of India) was approached. The tax practitioners were asked to refer their peers who would be willing to participate in the study. The 316 participating sampled respondents included tax practitioners with a minimum working experience of three years. The respondents were selected from three major provinces of Northern India – Punjab, Haryana, Himachal Pradesh & Union Territory of Chandigarh (Table 2).

4. Analytic Results: Exploratory Factor Analysis & Confirmatory Analysis

Exploratory factor analysis has been applied to validate the underlying four-factorial structure followed by confirmatory factor analysis. One important consideration in using factor analytic technique calls for validating the reliability and content validity of the scale. Various parameters to confirm the same (outlined in Table 3) have been examined that ensured the appropriateness of the methodology. Through the application of Principal Component Analysis, exploratory factor solution with four extracted factors (based on eigen values greater than 1) alongside cumulative variance explained accounting for percent of the total variation of the index has been extracted (Table 2). Furthermore, psychometric properties of the scale

stands testified thereby establishing the reliability and validity of the model structure. Furthermore, CFA has been applied through AMOS 20.0 allowing us to validate the postulated structure.

All the important measures of model fitness namely goodness of fit (CFI, GFI, IFI etc.) and badness of fit indices (RMSEA, RMR) were found to be within the tolerable/prescribed limits (Table 3). Scale validity has been established using the three prominent measures— content validity, convergent validity and discriminant validity. Content validity stands established during the process of item generation stage itself

by ensuring the relevance of items through a consultative exercise with domain experts.

Setting the factor extraction criteria (eigen value > 1) and factor loading (> 0.5) in both EFA and CFA ensures convergence among correlated items. The discriminant validity has been established through examination of square root of AVE being greater than the phi coefficient among scale constructs. Finally, the CFA model was tested for hypothesis validation and the model statistics (Table 3) found stakeholder view, Machiavellianism construct along with compliance costs to be significantly effecting the conceptual framework.

Table 2

Factor Structure

Factor (s) (% variance explained/ Eigen value)	Constituent Variables	Factor Loadings	
		EFA	CFA
Stakeholder view (13.30%/6.48)	Paying more tax would not change the amount of benefits that I receive from the government	0.815	0.963
	Good ethics is often good business	0.794	0.944
	The ethics and social responsibility of an individual is essential to its long-term profitability	0.723	0.543
	Social responsibility and profitability can be compatible	0.708	0.527
	The overall effectiveness of a business can be determined to a great extent by the degree to which it is ethical and socially responsible	0.708	0.559
	Being ethical and socially responsible is the most important thing an individual can do	0.660	0.633
	Business has a social responsibility beyond making a profit	0.658	0.584
	Business ethics and social responsibility are critical to the survival of a business enterprise	0.550	0.411
Compliance costs (Financial concerns) (26.01%/4.66)	One Should pay tax honestly even if it does not benefit us	0.953	0.909
	Willingness to pay tax depends largely on how government spends the collected revenue	0.933	0.984
	If in doubt whether to report a particular income or not, people prefer not to report it	0.931	0.762
	One cannot carry his/her occupation successfully by paying tax honestly	0.906	0.962
	People cheat on taxes when they are not satisfied with their financial condition	0.887	0.718
Compliance costs (Social contract) (48.44%/3.93)	When people trust their government, willingness to pay increases	0.828	0.969
	People are less likely to cheat if they find others behaving honestly	0.823	0.927
	Tax cheating is acceptable if chances of strict punishment are rare	0.807	0.917
	The opportunities to evade tax are freely available	0.803	0.745
	If the tax system is unfair, cheating is justified	0.715	0.564

Table 2 (End)

Factor (s) (% variance explained/ Eigen value)	Constituent Variables	Factor Loadings	
		EFA	CFA
Machiavellianism Scale (Convictions) (37.87%/4.26)	It is hard to get ahead without cutting corners here and there	0.875	0.885
	The biggest difference between most criminals and other people is that the criminals are stupid enough to get caught	0.847	0.845
	Never tell anyone the real reason you did something unless it is useful to do so	0.801	0.767
	All in all, it is better to be humble and honest than to be important and dishonest	0.790	0.717
	The best way to handle people is to tell them what they want to hear	0.780	0.698
	Generally speaking, people won't work hard unless they're forced to do so	0.745	0.667
Machiavellianism Scale (Morality) (58.80%/1.72)	Anyone who completely trusts anyone else is asking for trouble	0.805	0.726
	One should take action only when sure it is morally right	0.797	0.730
	Most people who get ahead in the world lead moral lives	0.796	0.785
	It is safest to assume that all people have a vicious streak, and it will come out when they are given a chance	0.711	0.707
	Honesty is the best policy in all cases	0.645	0.606
	There is no excuse for lying to someone else	0.606	0.614
Stockholder view (65.97%/1.35)	If survival of business is at stake, then one must forget about ethics and social responsibility	0.793	0.760
	If the stockholders are unhappy, nothing else matters	0.740	0.680
	The most important concern for a firm is making profit, even if it means bending or breaking the rules	0.704	0.637
	Efficiency is much more important to a firm than whether or not the firm is seen as ethical or socially responsible	0.684	0.697

Total variance explained = 65.97%; KMO = .838; Bartlett's Test of Sphericity = 7647.48 (.000)*; No of items = 36; Alpha = 0.7 ; Source: Compiled from SPSS 21.0

Table 3

Confirmatory Factor Structure						
Construct	CR	AVE	CMIN/DF	IFI	CFI	RMSEA
Stakeholder View	0.788	0.493	1784.70/512 (3.48)	0.85	0.85	0.08
Stockholder view	0.859	0.542				
Machiavellian Scale	0.895	0.589				
Convictions	0.849	0.487				
Morality	0.941	0.763				
Compliance costs	0.919	0.702				
Financial concerns						
Social contract						
Hypothesis Testing	β	p-value	(Dependent Variable: Tax ethics)			
H1: β ₁ = 0	0.23	< 0.001	H1: Stakeholder View does not impact tax ethics			
H2: β ₂ = 0	0.08	< 0.05	H2: Stockholder View does not impact tax ethics			
H3: β ₃ = 0	0.21	< 0.001	H3: Machiavellian scale does not impact tax ethics			
H4: β ₄ = 0	0.11	< 0.001	H4: Compliance costs does not impact tax ethics			

5. Discussion & Implications for Practice

Tax practitioners have for long been considered as a principal stakeholder in the domain of taxation. The growing complexities in the tax system coupled with the statutory requirement to maintaining voluminous records have increased their role in the tax system exponentially. Furthermore, the encouragement of voluntary compliance system worldwide also calls for a crucial role to be played by the tax practitioners in enforcing tax compliance.

Hence, the role of tax professionals in ensuring compliance with the tax system has increased manifold. Taxpayers approach tax practitioners due to numerous reasons being tax complexity inherent in the tax law and also to seek “expert opinion” for ensuring correct tax returns or circumventing payments of taxes at all. So, the present study has made an attempt to identify the underlying domain behind tax ethics of such professionals.

The statistical results revealed that tax practitioners’ ethics is indeed reflected by the postulated framework. The application of factor analysis revealed the underlying domain to be a function of four-dimensional structure – stakeholder view, Stockholder view, Machiavellianism construct (morality and convictions) along with compliance costs (financial concerns and social contract). The issue concerning these dimensions finds its prominence in the literature as well [28; 48–50].

Based on the CFA results, three of the hypothesis – *H1* (stakeholder view does not impact tax ethics), *H3* (Machiavellian scale does not impact tax ethics) and *H4* (compliance costs does not impact tax ethics) have been found to be statistically insignificant, i.e. both the null hypothesis have been accepted at 1% level of significance. Accordingly, there exists a relationship between the tax practitioner’s ethics and these dimensions of the postulated structure.

The scale so developed intends to make exclusive contribution to the body of literature in at least two different means. First, the tax ethics dimension which has been treated as the black box of late has

been explored as a multi-dimensional phenomenon. Secondly, we have attempted to include the elements of socio-macro-economic concerns having a bearing on tax compliance attitude of individuals as outlined by Shafer et al. [13], Sharma et al. [46], Wurth [51]. Past research efforts have tended to identify the causal drivers of shadow economy or why people participate in underground economy.

However, the impact of such drivers on tax professionals’ compliance attitude has not been effectively incorporated. So, while there has been an over emphasis on economic determinants other aspects especially the non-economic dimensions like tax ethics and dynamics of shadow economy participation/intention had been under-represented. The present study thus makes an attempt to delve into the unexplored domain. To sum up, the scale intends to contribute to in depths of tax compliance theory and probably the relationship between the state and the subjects via intermediaries like tax professionals in the contemporary settings.

6. Conclusion

Soliciting enhanced tax compliance has always been an inspiring domain for the exchequer. The developing world especially, still expects the state to play a major role in the economic development and social welfare. For discharging such responsibilities, state needs sufficient revenue resources being channelized through tax collections. Long before, United Nations Expert Group on Tax Reform Planning observed that “Tax evasion is not only a function of tax rates alone, but also a matter of attitude among taxpayer’s community”.

The present study marked an attempt to study the dynamics from an intermediary’s perspective. The role of such intermediaries namely tax practitioners in stimulating tax compliance has been empirically validated.

Hence, such an understanding provides vital help in future tax policy initiatives to induce tax compliance effectively. The relevance of tax ethics which came up with the Cologne School of Tax psychology in the 1960s is said to provide

valuable information relating to possible tax compliance and evasion perception. The present study presents us with some interesting avenues on the front of soliciting enhanced tax compliance. If societal values and customs do not treat evasion of tax as a “forbidden sin”, tax compliance more or less becomes a function of administrative efficiency and deterrence. Multi-disciplinary research examining issues involving dynamics of unaccounted incomes or what is called “black money” in common parlance along with identification of determinants of tax ethics of the stakeholders can also provide further insights into the underlying reasons for low level of compliance.

The present study has been conducted in relation to tax professionals which is considered as highly sophisticated and somewhat tech savvy segment. The nature of present study being the primary one can be another constraint as the perception of the respondents towards the tax system platform and may change in terms of longitudinal studies. Since the results pertain to sampled respondents conducted in a dedicated sample region only, results cannot be generalized for all the spheres. Future studies shall be conducted to validate the revised model in varied contexts which can further strengthen the relationship dynamics among the underlying constructs.

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Tax Compliance Model Based on Taxpayers Planned Behavior in Indonesia

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ABSTRACT

Taxes are the largest contributor to the state revenue in Indonesia, therefore tax compliance is required to meet the revenue target. This research aims to examine and analyze relates to the effect of the correlation between planned behavior of taxpayers and mediating intention to pay taxes on tax compliance in an effort to encourage the growth of state revenues. These research hypotheses are: 1) Taxpayers' planned behavior has an effect to the tax compliance; 2) Taxpayers' planned behavior has an effect to the intention to pay taxes; 3) Intention to pay taxes has an impact towards tax compliance and 4) Intention to pay taxes could mediate the influence of taxpayers' planned behavior against the tax compliance. These research models are mixed method with quantitative approach which strengthened by concurrent triangulation design. This research used SEM-Lisrel as a data analysis method with total sample of 310 respondents who are individual taxpayers in Bekasi, Indonesia that have been reported to the 2021 Annual Tax Return. This research found that: 1) Taxpayers' planned behavior can improve tax compliance; 2) Taxpayers' planned behavior will boost the intention to pay taxes; 3) Intention to pay taxes can improve tax compliance; and 4) The intention of taxpayers could be able to mediate taxpayers' planned behavior towards tax compliance. The implication of this research is that special regulations are needed which ruled the connection between the tax authorities and taxpayers as a harmonious professional bondage because both of them have an unequal interest and it is necessary to examine these taxpayers, both of corporate taxpayers and individual taxpayers in supporting the implementation of self-assessment system in Indonesia.

KEYWORDS

tax compliance model, taxpayer behavior, intention to pay taxes, tax compliance, state revenue, tax protection, taxation in Indonesia

JEL H21, H71, H24

УДК 351.72

Планируемое поведение налогоплательщиков как основа для реализации модели налогового комплаенса в Индонезии

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АННОТАЦИЯ

Налоги являются крупнейшим источником государственных доходов Индонезии, поэтому для достижения целевых показателей бюджета, необходимо соблюдение налогового законодательства. Исследуется влияние корреляции между запланированным поведением налогоплательщиков и их опосредованным

намерением платить налоги на соблюдение налогового законодательства в целях поощрения роста государственных доходов. Выдвинуты гипотезы: (1) Планируемое поведение налогоплательщиков влияет на соблюдение налогового законодательства; (2) Планируемое поведение налогоплательщиков влияет на намерение платить налоги; (3) Намерение платить налоги влияет на соблюдение налогового законодательства; (4) Намерение платить налоги может опосредовать влияние планируемого поведения налогоплательщиков на соблюдение налогового законодательства. В исследовании использовался смешанный метод с количественным подходом, который усиливался параллельным триангуляционным дизайном. Мы использовали SEM-Lisrel в качестве метода анализа данных с общей выборкой из 310 респондентов, являющихся индивидуальными налогоплательщиками в Бекаси (Индонезия) и зарегистрировавших свои годовые налоговые декларации за 2021 год. Исследование показало следующее. Во-первых, планируемое поведение налогоплательщиков может улучшить соблюдение налогового законодательства. Во-вторых, планируемое поведение налогоплательщиков будет стимулировать намерение платить налоги. В-третьих, намерение платить налоги улучшает соблюдение налогового законодательства. В-четвертых, намерение платить налоги опосредовано влияет на поведение налогоплательщиков в соблюдении налогового законодательства. Сделан вывод о необходимости выработки специальных правил, гармонизирующих профессиональные обязанности при взаимодействии между налоговыми органами и налогоплательщиками, поскольку данные субъекты имеют разные интересы. Кроме того, необходимо стимулировать корпоративных и индивидуальных налогоплательщиков к внедрению системы самооценки в Индонезии.

КЛЮЧЕВЫЕ СЛОВА

модель налогового комплаенса, поведение налогоплательщика, намерение платить налоги, соблюдение налогового законодательства, государственные доходы, налоговая защита, налогообложение в Индонезии

1. Introduction

Taxes are the lifeblood of a country without taxes the survival of the state will not be able to run well, not to mentioned for Indonesia, taxes seemingly as a spearhead in the implementation of government policy, just because it is the largest source of state revenue [1]. Payment of taxes is a manifestation of state obligations and participation from taxpayers to directly and jointly conduct tax obligations for state financing, including in the implementation of national development.

State Revenue and Spend Budget are set with target of tax revenues who's the numbers are continuing to increase, but tax rates tend to decrease and getting effortless, this intended to maintain the interests of taxpayers in adjusting economic developments both nationally and internationally. The government in this case are the Directorate General of Taxes always strives to meet the tax revenue targets that have been set every year. The amount of tax revenue is actually growing well, but

its realization has not yet been able to meet the targets which set by the government, even in the last ten years these tax revenue target could not be achieved [2]. Tax revenues that are not optimal can be caused by the level of taxpayer compliance and other problems that occur at the Directorate General of Taxes itself such as structural problems, transparency problems and behavioral problems in taxation and this tax compliance are closely related to taxpayer behaviour [3].

In order to increase the tax revenue, Indonesia seeks to carry out various policies such as structural reforms related to the availability of more adequate fiscal space in an effort to fulfill financing in priority areas such as education, health, poverty alleviation and infrastructure so as to ensure strong and inclusive economic are growth sustainably. State revenues need to be increased particularly tax revenues by increasing various efforts in the tax network, including by increasing the effectiveness of tax collection.

Indonesia is a developing country in the growth stage, but the pace of reform, especially the economy, has been slowed in recent years, even though the government has taken protectionist measures such as efforts to prevent tax evasion [4]. Then, taxpayers who carry out their obligations to pay taxes to assist the implementation of government so that in their acceptance and management, adequate transparency and accountability are needed. The government reports revenue and tax management are carried out at the time of accountability of the State Budget and Revenue once a year before the House of Representatives [2].

Indonesia as a member of the G-20, which is a group of 20 major economies, 19 countries with the largest economies in the world, plus the European Union. Officially the G-20 is called The Group of Twenty (G-20) Finance Ministers and Central Bank Governors or the Group of Twenty Ministers of Finance and Central Bank Governors, with one of the agendas being efforts to implement information disclosure in the Automatic Exchange of Information (AEOI) in order to optimize tax revenue of the state [5]. Taxpayers who pay their taxes correctly are so called an obedient taxpayer. The number of taxpayers who make the right payments still not as expected when compared to the potential taxpayers, while the OECD has recommended that the minimum level of compliance should be at the 95% level. For developed countries, the level of compliance of individual taxpayers is higher than that of corporate taxpayers.

Indonesia's own tax compliance is still relatively low, this can be shown in the realization of tax revenues in the State Budget of the Republic of Indonesia which still cannot be fulfilled in the last ten years [2]. In fact, Indonesia's largest state revenue is obtained from the tax sector. The Low of tax revenue resulting in a low tax ratio in Indonesia which is one of the indicators in assessing the performance of tax revenues [4]. The data obtained by the authors marked that Indonesia's tax ratio in 2015 was 11.6%, in 2016 it was 12%, in 2017 it was 11.5%, in 2018 it was 11.5% and

in 2019 it was 11.6% which the figures are: This figure is still below the standards of ASEAN countries of around 15-19% and the Organization on Economic Cooperation and Development (OECD) of 34.2% and below the LAC (Latin America and the Caribbean) average of 22.8 % and Africa 18.2% [4]. The ideal figure of Indonesia's tax ratio when referring to international standards is 15%, this indicates that the level of tax compliance in Indonesia is low [4].

Indonesia's low tax ratio indicates that tax revenue is still less than optimal, this could be the impact from the low level of tax compliance. Taxpayer compliance will be manifested in a tax return (SPT) both periodic and annual which is the embodiment of the self-assessment system [6]. In a smaller scope at the West Bekasi Madya Service Office level, there were 392,956 registered taxpayers with 106,662 SPT mandatory in the mid-2021, but compliant taxpayers which done reported only 32,922 SPTs. At the end of 2021, the level of taxpayer compliance shows the type of manual reporting as many as 19 taxpayers and eSPT as many as 69,212 taxpayers [7]. This figure shows a relatively low level of tax compliance compared to other countries, especially those from developed countries, even it was referring as the lowest in Asia Pacific as recommended by the OECD [4].

According to these phenomena, the authors consider that research on tax compliance is still very much needed in order to provide suggestions for the Directorate General of Taxes of the Republic of Indonesia, due to the taxpayers planned behavior plays an important role in determining tax compliance.

This research aims to analyze further relates to the impact caused between taxpayers planned behavior which mediating intention to pay taxes on tax compliance in an effort to support the stability of state revenues.

This should be done because the author's provisional assumption stated that the taxpayers planned behavior have impact towards tax compliance in Indonesia; Taxpayers planned behavior

could also affect on the intention to pay taxes in Indonesia, and the intention to pay taxes will affects the tax compliance in Indonesia; as well as the intention to pay taxes could mediate the influence of taxpayers planned behavior towards tax compliance.

2. Literature Review

2.1. Tax Compliance

According to Gunadi [8], there are several factors that can affect tax compliance, namely compliance costs, tax regulation & law enforcement. Compliance costs are the costs other than payable taxes paid or incurred by taxpayers in the context of fulfilling their tax obligations which include direct money costs, time costs & psychological costs [8]. Tax regulation is a tax law that creates a condition that there is no doubt in the implementation of tax provisions for tax officials and taxpayers through clearly structured wording. Law enforcement is the implementation of regulations that are carried out adequately by prioritizing the principle of justice, such as equal treatment for the same conditions (equal for the equals) and different treatment (unequal for the unequals) and implemented consistently will support the achievement of optimal tax compliance conditions.

Furthermore, Asih et al. [9] suggests that taxpayer compliance can also be taxed seen from several methods such as registering and reporting, the level of accuracy of reports and payments. Through this compliance those tax revenue target can be met. The tax revenue target set by the government itself considers various micro and macro aspects, so that the key to success in achieving the state revenue target is through a self-assessment system that gives taxpayers the authority to calculate, deposit and report their tax payable independently.

In Indonesia, the Directorate General of Taxes has formulated and implemented strategic policies by improving a set of tax regulations and tax administration policies in an effort to maintain the tax revenues. These efforts are include expanding

the tax base by increasing the number of registered taxpayers to have a NPWP [10]. Another effort made by the government is to provide various facilities that can be use by taxpayers and provide convenience for those taxpayers with certain criteria that have been issued [11].

With these efforts, it is expected to create professional public services [12], manage tax money fairly and transparently [13], create tax regulations that are easily understood by taxpayers and increase the law enforcement actions for non-compliant taxpayers [14], so that the success of tax revenue in a country can be fulfilled and accomplished of good corporate governance [15].

2.2. Intention to Pay Tax

Intention is a function of important beliefs and/or information about the tendency that performing a particular behavior that will lead to a specific outcome. A person's intention to display a behavior is a combination of the attitude to display the behavior and subjective norms and perceived behaviour [16].

According to Bobek & Hatfield [17] in their research about tax compliance, subjective attitudes and norms have an influence in increasing the tax compliance. Meanwhile, according to Marandu et al. [18], intention to pay taxes can be increased through attitude which consists of behavioral belief and importance of belief, subjective norm which consists of normative belief and motivation to comply, perceived behavioral control which consists of control belief and perceived power.

Batrancea et al. in her research [19] through an aggregate analysis revealed that showing ethics, normative and subjective as a whole have a positive and significant affect on the intention to pay taxes. Then, according to Smart [20] found that non-economic variables have a positive and significant affect on tax compliance behavior, while intention as an intervening variable can be influenced by social differences, tax authorities, tax systems, attitudes, subjective norms, perceptions of control and legal sanctions method.

All of them have a positive and significant affect on tax compliance. Furthermore, it was also emphasized that the taxpayer's intention to pay taxes is the key to the taxpayer compliance. The Intention to pay taxes means that taxpayers are ready to pay taxes in order to fulfill their taxes obligations [21]. Taxpayers who tend to pay taxes can be concluded that they will comply with tax regulations which will have an impact to the increasing of state revenues.

2.3. Taxpayer Planned Behavior

The planned behavior of taxpayers in this research could be defined as an individual forming a clear intention to manifest tax compliance behavior. The taxpayer's planned behavior is emphasized in three behavioral components: attitudes, subjective norms, and perceived behavioral control.

According to Ajzen [16], taxpayers have attitudes that can be influence and determine a person's intention to engage in certain behaviors, so that it will be beneficial for them and tend to be involved in these kind of activities. Attitudes include moral values and feelings such as community obligations as taxpayers in addition to the rights that can be obtained [22]. Subjective norms refer to the views of certain people that are relevant to the individual who performs the behavior or can used as guidelines about the behavior. While Kirchler et al. [23] in his neoclassical view reveals that tax behavior can be a good in controlling the paying taxes.

In the other hand, current compliance enforcement tools still rely on economic prevention models such as inspections and sanctions that require high costs due to limited human resources that tax authorities have to deal with non-compliance [24], so the attitudes, subjective norms and control behavior are needed.

According to Batrancea et al. [19] subjective attitudes and norms have a positive impact on taxpayer compliance intentions and behavior. Furthermore, Torgler & Schneider [25] found the influence of people around (subjective norms) and perceived behavioral control had

a positive impact to the tax compliance intentions.

Other factors such as social norms could become a predictors which have significant affect to the tax compliance behaviour [22]. On the other hand, [26] also found seven determinants factors from the tax compliance intentions, such as tax justice, tax morale, trust in government, tax complexity, perceived power of authorities, tax information and tax awareness. Thus, the taxpayers planned behavior could be built by personal encouragement supported from external factors which make them believe in the distribution of tax funds which on target.

2.4. Conceptual Framework and Hypothesis

According to the research background and research theory above, the authors want to explore more about the role of intention to pay taxes in mediating the influence of taxpayers' planned behavior towards tax compliance in an effort to support the Pacification of state revenues which in line with the implementation of self-assessment system in Indonesia (Figure 1).

Based on the conceptual framework depicted in Figure 1, the proposed hypothesis could be drawn as follows:

H1: Taxpayers planned behavior have an impact towards tax compliance.

H2: Taxpayers planned behavior have an impact towards the intention to pay taxes.

H3: The intention to pay taxes have an impact towards tax compliance.

H4: Intention to pay taxes are mediates the taxpayers planned behavior to have an impact towards tax compliance.

3. Research Methods

This research is a combination between quantitative and qualitative research (mix method) with a reflective approach to answer complex problems. The strategic approach used in carrying out these mixed method in this research is concurrent triangulation design by collecting both qualitative and quantitative data altogether and then doing a comparison between these

two so as to reveal the correlation between these two [27]. In the reflective model, the internal consistency needs to be checked which assumes that each indicator is homogeneous and unidimensional.

This research applies a scale that is used as a reference to determine the amount of interval in measuring instrument, so that once it uses as measurement it will produce the quantitative data [28]. The measurement in this research itself is uses a Likert scale in order to be assessing the level of taxpayer compliance through exogenous variables of taxpayers planned behavior with mediating variable of intention to pay taxes and endogenous variables of tax compliance. The Determination of Likert scale by using a score and to state the level of agreement by putting scale number from 1 to 5 which distributed in the form of a questionnaire (Table 1).

This research used a unit of analysis for individual taxpayers who have been submitted to their annual SPT in the Bekasi Region, Indonesia with a total sample of 310 respondents that obtained by purposive random sampling technique [28]. To strengthen these analysis results, debt interviews were conducted with several competent officers within the Indonesian Tax Office [27].

Then, this research data analysis method used statistical data analysis with multivariate through SEM-Lisrel to examine the research hypotheses [29]. The analysis technique and drawing conclusions with the concurrent triangulation design method can be done by the data transformation which is done by transforming the data into the theme under this study, namely the intention to pay taxes which mediated by Tax Compliance.

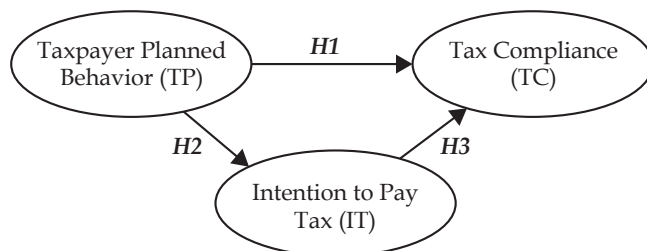


Figure 1. Conceptual Framework

List of debt interview questions which addressed to the tax office staff in the Republic of Indonesia

Table 1

No.	Question List
1.	What is your opinion about the Tax Compliance in Indonesia?
2.	How about the level of tax compliance in Indonesia compared to other countries, especially if it is compared to the developed countries?
3.	What is your view regarding the behavior of taxpayers in Indonesia from time to time?
4.	If the taxpayer get fine for the violation of tax itself, will these punishment have a good impact by creating an obedient taxpayers or vice versa?
5.	Is it necessary to give certain notes to the taxpayers who have been fulfill their tax obligations in a certain period?
6.	The succeed in improving tax compliance, is it will be better if the taxpayers are given a sanction for their violation or tax obligation based on self-awareness by the taxpayer?
7.	Does the behavior of taxpayer have anything to do with the intention of the taxpayer?
8.	Does the level of taxpayer compliance need to be clustered or grouped? In an effort of tax compliance?
9.	Along with the changes in development, especially in technology, is there any impact to the tax compliance in Indonesia?

The research phase begins with pre-research to find symptoms/phenomena which occur in the field; after the pre-research done, then the author distributes the questionnaires to each respondents who have been assigned and those questionnaires are converted into a numbers of (scales) through data tabulation; after these data tabulation is completed then it was analyzed by the Lisrel which reflects on the research results; For the next step, the author was decided to conduct a debt interview with the officers of the Directorate General of Taxes and those results would be compared to the research results which had been done before (Figure 2).

As for the final stage of this research are the author made the conclusions from the comparison results then provides suggestions which needed by the Directorate General of Taxes in Indonesia in order to increase the tax revenues.

4. Results

The results from the statistical tests of this study (Table 2) indicates that:

1. Taxpayers planned behavior has a significant positive affect on tax compliance. This proven by the coefficient value

of 0.32 and t-table (2.16) > 1.97, so that the hypothesis 1 is accepted.

2. Taxpayers planned behavior has a significant positive affect on the intention to pay taxes. This proven by the coefficient value of 0.83 and t-table (8.24) > 1.97, so that hypothesis 2 is accepted.

3. Intention to pay taxes has a significant positive affect on tax compliance. This proven by the coefficient value of 0.47 and t-table (3.47) > 1.97, so that hypothesis 3 is accepted.

4. Intention to pay taxes could be able to mediate the influence of taxpayer behavior planning towards tax compliance. This proven by the coefficient value of 0.43 and t-table (28.59) > 1.97, so that hypothesis 4 is accepted.

The results from the data processing in this research can be shown in Figure 3.

The results of these data processed were also in line with the answers to the results of debt interviews which the authors have been submitted to the Tax Officers in the Republic of Indonesia. These debt interview results were indicated that the level of tax compliance in general is a problem in all countries, includes in Indonesia. Therefore, the topic of tax compliance is still very relevant to do.

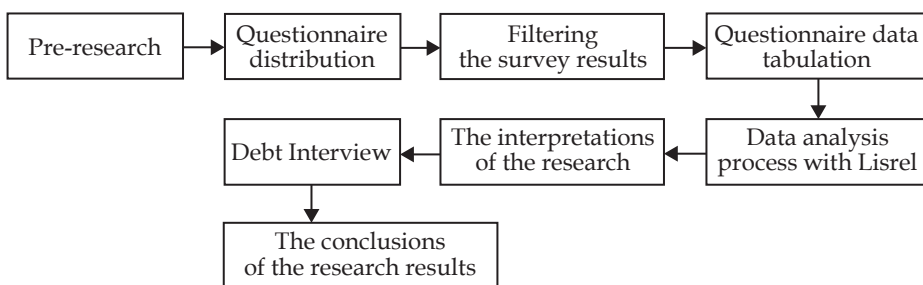


Figure 2. Describes the research procedures and its stages

Table 2

Presents the Statistical Test Results

Hypothesis	Path	t-value	Coefficient	Result
H1	Taxpayer planned behavior (TPB) → Tax compliance (TC)	2.16	0.32	Received
H2	Taxpayer planned behavior (TPB) → Intention to pay tax (IT)	10.00	0.92	Received
H3	Intention to pay tax (IT) → Tax compliance (TC)	2.75	0.47	Received
H4	Taxpayer planned behavior (TPB) → Intention to pay tax (IT) → Tax compliance (TC)	27.50	0.43	Received

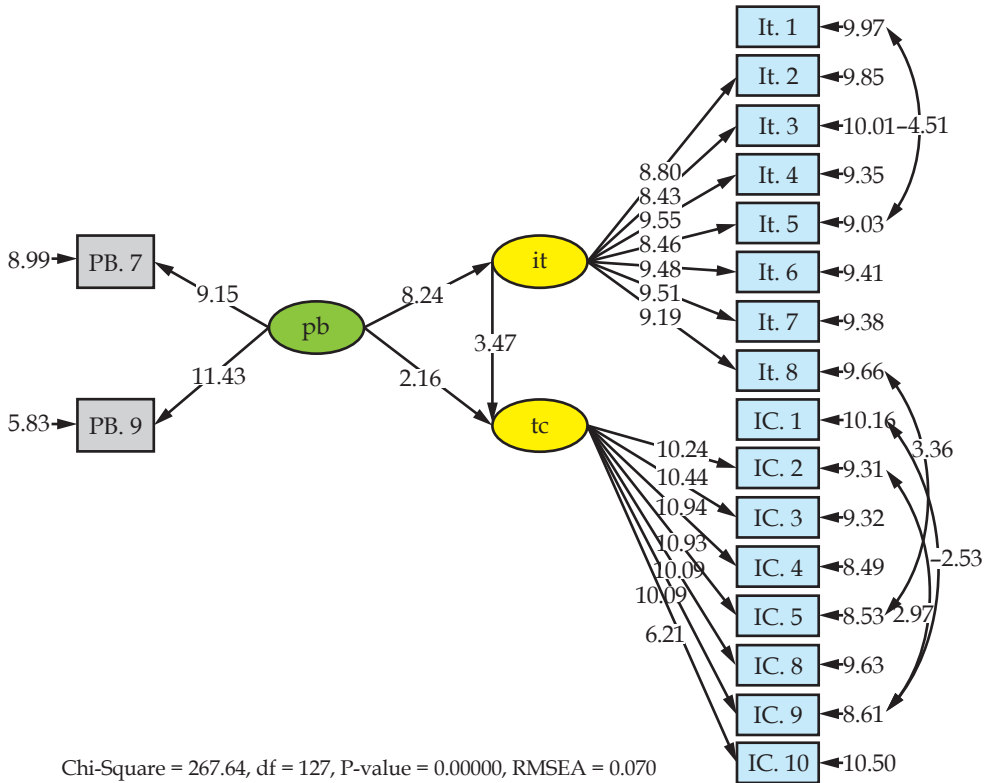


Figure 3. Illustrates the Structural Standardized Full Model

When it comes to the level of tax compliance in Indonesia, it is still far from expectations, why? If we look at the data from developed countries, the level of tax compliance is more dominated by Individual Taxpayers (WPOP), while what happens in Indonesia is the opposite to that. Tax compliance seems dominated by corporate taxpayers, this is because it is still related to the tax audits.

If it is oriented by the level of tax compliance in developed countries which are dominated by WPOP, then it is very rational. Why's that? Because basically the taxpayer is an individual, including the company which run its operations by individual.

If we talk about the sanctions given to taxpayers who commit violations, if we seen from the government's point of view means that is the last option or in other words it is forced. In fact, the government really expects taxpayers'

awareness to conduct their tax obligations by implementing a self-assessment system policy.

The establishment of tax compliance based on self-awareness is actually a highly coveted hope by the government, but it is not as easy as turning the palm of the hand, because of what? Because there are still so many complex aspects that need to fulfill in order to make it happen. Taxpayers who have met the criteria for tax compliance have been given appreciation by the government at that time with the title "Golden Taxpayer", but it did not last long.

If we talk about human behavior, it is basically the same thing, which is rational thinking. Paying taxes is a sacrifice, why's that? Because it will automatically reduce the amount of money. So actually, the taxpayer is not happy to pay taxes. Then so you know that it is not easy to build tax awareness.

Tax compliance is certainly beginning with the intention of the taxpayer to pay the tax obligations, why's what? Because the Taxpayers who have understood their tax obligations, have even done with calculations of applicable tax provisions, but if there is no intention to pay taxes, this tax payment will not be realized into the state treasury.

In an effort to conduct the supervision, the actual grouping of taxpayers needs to be done, but at the Directorate General of Taxes there is still a shortage of human resources by means this cannot be accomplished. By grouping the level of tax compliance, it will be easier in terms of providing more appropriate treatment, because it provides guidance for taxpayers who will comply and different to the taxpayers who defiance.

Along with the demands of the development particularly in technology, in fact that the government has been trying to do so many things such as starting for creating electronic-based payment and tax reporting, but we also realize that there are still needs room to improve.

An effort to increase the tax compliance has become our shared responsibility, not only the government, but also the wider community to carry out this mandate. Especially in the academic community to conduct this kind of research so that it can continue to assist the government in its efforts to continuously improve tax compliance. If tax compliance continues to growth, the independency of this nation will be realized so that the noble mission to prosperous the society will be accomplished.

5. Discussion

From the statistical test results, there is a significant positive affect of the taxpayers planned behavior on tax compliance. This indicates that the taxpayers behavior is closely related to tax compliance. Basically, the purpose of implementing the self-assessment system is to give taxpayers confidence to be more independent in managing their tax administration [6]. The implementation of the principle of tax collection adopted in Indonesia in order

to build a modern tax system, namely the principle of full delegation of trust to taxpayers [30].

The success of the implementation of this tax collection system requires an awareness, honesty and discipline of taxpayers in conduct their tax obligations so they can meet the material and formal aspects of fulfilling their tax obligations [31]. Taxpayers in calculating their tax payable should focus on the fiscal provisions regulated in Law Number 36 of 2008 concerning Income Tax, especially article 6 regulates fiscal costs and article 9 costs that cannot be financed fiscally. Income tax is a type of cost that is commercially financed, but fiscally the opposite treatment cannot be financed, therefore taxpayers can work around this with several strategies such as maximizing deductible expenses, delaying income, accelerating the imposition of costs or through other strategies [32].

The affect of the taxpayers planned behavior on tax compliance statistically has a positive impact on tax compliance. This can be interpreted that the increase of taxpayers planned will increase tax compliance. The taxpayers behavior are diverse, some are obedient, some are trying to comply, some are disobedient and some are even deliberately disobedient [19; 33]. Taxpayers can do tax planning in an effort to get an efficiency, this likely happen because the tax system that applies in Indonesia is a self-assessment which gives full authority to taxpayers to calculate their owned taxes independently. The results of this research are in line with [34-36] who declared that with more comprehensive social norms, taxpayers planned behavior will increase the tax compliance.

Based on the statistical test results, there is a significant positive affect which occurred between the taxpayers planned behavior on the intention to pay taxes. This means that taxpayers who have good planned behavior will tend to have the intention to pay their taxes. The variable of the taxpayers planned behavior is a benchmark in fulfilling the intention to pay taxes as the manifestation of tax

compliance. This finding has supported by [37; 38] who found the similar results [39; 40] with the findings of this research. Through this finding, the taxpayers are obedient to pay taxes if their rights are fulfilled or their contra-achievements can be fulfilled by the government so they can feel the benefits of paying taxes and commensurate with the sacrifices that have been made, this statement is according to the justice theory [41]. Public trust to the government will increase if the public's perception of the tax system implemented by the government is considered fairness and beneficial in terms of procedural, distributive and retributive [42].

Based on the statistical test results, there is a significant positive impact which occurred between the intention to pay taxes and tax compliance. Thus, it can be interpreted that the stronger the taxpayers intention to pay taxes, will increase the tax compliance and vice versa. The intention to pay taxes is the key to the tax compliance, even though the amount of tax owed has been calculated but if there is no intention to pay taxes, then this tax will not go into the state treasury. Intention to pay taxes has a central role in explaining the behavior of someone who is obedient or disobedient in paying taxes. Intention to pay taxes on tax compliance has a significant positive impact [43; 44]. This can be interpreted that the higher the taxpayers planned behavior, the higher taxpayer compliance will be. These results are in line with the research by Ajzen [16] in the theory of planned behavior which states that attitudes, norms and perceived intentional behavior have a significant influence on tax compliance. Likewise, the research conducted by [45; 46] found that taxpayer behavior had a significant impact to the tax compliance.

Based on the statistical test results, there is role of intention to pay taxes in fully mediating the influence between taxpayers planned behavior and tax compliance. This certainly will have an impact to the increasing of Indonesia's tax ratio.

The verdict from the results of the debt interviews which were conducted thoroughly with The Directorate Gener-

al of Taxes's officers can validate the results of the data analysis in this research. Based on the debt interviews and the research results show that taxpayer's behavior through the intention to pay taxes has a positive influence on tax compliance. This indicates that taxpayer compliance in Indonesia is still dependent on the impact from the tax authorities such as the imposition of sanctions that will be given either in the form of fines or other sanctions.

Moreover, the self-assessment system is implemented to provides space and trust for taxpayers to carry out their tax obligations independently. Tax compliance seems not fully as a conscious awareness for taxpayers so those various efforts to improve tax compliance still needed in order to reach the target set in increasing Indonesia's tax ratio. If the tax revenues can reach the amount expected with the target set, then the government will no longer need other countries support in the form of loans so the prosperous society will be achieved.

6. Conclusion

According to the hypothesis test results and the discussion that has been coveyed above, the conclusions of this research are:

- 1) There is a significant positive affect of taxpayers planned behavior on tax compliance.
- 2) There is a significant positive affect of the taxpayer's planned behavior on the intention to pay taxes.
- 3) There is a significant positive affect of intention to pay taxes on tax compliance.
- 4) The intention to pay taxes is fully mediates by the affect of the taxpayer's planned behavior on tax compliance.

The suggestions that can be convey from this research are:

Firstly, taxpayers planned behavior is a variable which can influence the intention to pay taxes, this intention to pay taxes is strongly influenced by it. Taxpayers planned behavior can change at any time so it should be built earlier or can be made from the trusted people

around them which can be realized in the form of tax learning from an early age.

Secondly, the strategic recommendation to the Directorate General of Taxes of the Republic of Indonesia, especially to the West Bekasi Intermediate Tax Service Office in an effort to improve the tax compliance are that this intention to pay taxes of the taxpayers need to be strengthened by the government through socialization and education and continuous law enforcement indiscriminately in order to create a sense of justice for the community.

Thirdly, the implementation of self-assessment system is actually a necessity given by the government to taxpayers in terms of calculating, depositing and reporting therefore it demands greater responsibility.

Taxpayers can obtain optimal benefits and reduce costs efficiently in order to achieve the goals that have been set by being tax compliant person, because by being tax compliance, taxpayers can avoid the imposition of sanctions in the form of interest sanctions, fines and an increase in taxation amounts.

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Power, Trust and Transparency as Determinant Factors of Tax Compliance: A Systematic Review

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ABSTRACT

This systematic review emphasizes the importance of expanding and deepening the theoretical framework of research on individual taxpayer compliance, particularly through integrated models. The main objective of this article is to systematically review the literature on tax compliance based on three determinants: coercive power, trust in tax authorities and transparency; and provide a direction for future research. There are three review questions in this paper, namely: (1) What is the present situation of the literature on the connection between coercive power and tax compliance; (2) What is the present situation of the literature on the connection between trust in tax authorities and tax compliance; (3) What is the present situation of the literature on the connection between “relationship transparency” and tax compliance. A systematic review of the literature was used to perform this review, considering 66 studies published in several suggested databases. The results are a call for a more sophisticated understanding of not only how suggested factors (Coercive Power; Trust; Transparency) affect tax compliance, but also how they interact and change each other and then, influence tax compliance. This review implies that enhancing tax service, transparency, and government trust is more successful and relatively easier to proceed than encouraging positive behaviour among taxpayers. This review is the first to systematically analyse the literature on tax compliance based on three determinants (coercive power, trust and transparency), as found, no synthesis studies have comprehensively covered the issue. This results in unique, motivating, and relevant discoveries that may be used to direct future studies and serve as a tool for academics, practitioners, and policymakers. Furthermore, this study would aid governments and tax authorities to understand the motives and perceptions of taxpayers into taxes.

KEYWORDS

coercive power, trust in tax authority, relationship transparency, tax compliance, tax non-compliance, tax system, systematic review

JEL H24, H26

УДК 336.02

Власть, доверие и прозрачность как определяющие факторы соблюдения налогового законодательства: систематический обзор литературы

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АННОТАЦИЯ

В этом систематическом обзоре аргументируется важность расширения и углубления теоретической базы исследований соблюдения требований налогового законодательства индивидуальными налогоплательщиками, в частности, с помощью интегрированных моделей. Целью данной статьи является систематический обзор литературы по соблюдению налогового законодательства на

основе трех детерминант: сила принуждения, доверие к налоговым органам и прозрачность, а также предложение направлений будущих исследований. Рассматриваются три обзорных вопроса, а именно: (1) Каково нынешнее состояние исследований связи между принуждением и соблюдением налогового законодательства; (2) Каково нынешнее состояние исследований связи между доверием к налоговым органам и соблюдением налогового законодательства; (3) Каково нынешнее состояние исследований связи между «прозрачностью отношений» и соблюдением налогового законодательства. Нами был использован систематический обзор литературы с учетом 66 исследований, опубликованных в нескольких базах данных. Полученные результаты отражают необходимость более глубокого понимания того, как анализируемые факторы влияют на соблюдение налогового законодательства, а также того, как они взаимодействуют и затем влияют на соблюдение налогового законодательства. Обзор демонстрирует, что такие меры как улучшение налоговой службы, прозрачности налогообложения, а также доверия к правительству являются более успешными и относительно легкими в реализации, чем поощрение позитивного поведения налогоплательщиков. Данный обзор является первым, в котором систематически анализируется литература по соблюдению налогового законодательства на основе трех детерминант (принуждение, доверие и прозрачность), поскольку было установлено, что ни одно обобщающее исследование не охватывало всесторонне этот вопрос. Это приводит к уникальным, мотивирующим и актуальным выводам, которые могут быть использованы для выбора направления будущих исследований и послужить инструментом для ученых, практиков и политиков. Кроме того, данное исследование поможет правительствам и налоговым органам понять мотивы и восприятие налогов налогоплательщиками.

КЛЮЧЕВЫЕ СЛОВА

принуждение, доверие к налоговому органу, прозрачность, соблюдение налогового законодательства, несоблюдение налогового законодательства, налоговая система, систематический обзор

1. Introduction

Taxation is a necessary component and plays an important role in all aspects of economic sectors [1]. Many important services and public goods are funded through funds earned from taxes. Consequently, individual desire to pay taxes is critical to a country's economic and social well-being [2]. Governments are projected [3; 4] to be pressed to encourage taxpayers not to dodge or understate their tax obligations as the demand for improving national health care, educational programs, and other critical public services is in mounting.

Hence, understanding the factors that support ongoing cooperation between the official authorities and taxpayers may aid in promoting tax compliance [5]. The degree to which a taxpayer complies with tax legislation is referred to as tax compliance (TC), it is also a taxpayers' behaviour or action in meeting or failing to meet tax rules [6]. Voluntary tax compliance (VTC) and enforced tax compliance (ETC) are two types of compliance behaviour [7]. VTC re-

fers to taxpayers who voluntarily disclose their income, calculate the exact their income taxes, and file tax returns on time [8]. Whereas, ETC presents taxpayers as non-cooperative, egoistic and must be coerced into contributing to taxation in order to fulfil tax commitments [9].

Commonly, the degree to which an individual adheres to tax regulations and laws indicates TC. However, indeed, this is not the case. It is far from simple or straightforward to comply with tax responsibilities. Many factors can influence a taxpayer's ability to meet their tax payments. Based on control or the power strength, TC determinants can be classified into two groups.

Firstly, the factors under the control of tax authorities such as tax service [10], trust in government [11] [11], tax audits, tax rates and penalties [12].

Secondly, factors influenced by culture of society and values (e.g., beliefs & customs) [3] or by taxpayer itself such as personal norms [13]. The two categories

are known as enforcement approach and psychology approach.

Allingham & Sandmo [14]’s model, which designed as an economic model to deal with tax non-compliance behaviour, was essential in persuading scholars to use the deterrence strategy. The model came to the conclusion that economic factors, particularly income level, audit, tax rates, and penalties, had an influence on the tax decision. In this aspect, the enforcement paradigm has previously dominated TC studies, because Allingham & Sandmo’s model of tax evasion was popular at the time [15]. However, the inconsistency between the model’s prediction and actual data has prompted numerous researchers to look for other factors that influence TC [16]. Several governments are currently seeking to adopt an expansive fiscal policy as seen by rising government spending, although the actual tax revenues are not fully as expected due to the tax gap [17]. Hence, it is critical to ensure that people pay their taxes so that the intended tax revenue is achieved.

Power is a term used to describe a tax authority’s ability to find and prosecute tax evaders [7]. Presence of a tax investigation accompanied with consequences against non-compliant taxpayers, power grows. Some prior research [18; 19] has found that when taxpayers have a positive opinion of the power of tax authorities, they are more likely to follow the rules.

Although having the power is vital for increasing TC, relying just on power is insufficient because not all taxpayers have the same impressions or perceptions on tax authorities. Previous studies [20–24] suggest that taxpayers’ trust in authorities has an effects on taxpayers’ compliance, and taxpayers’ trust is dependent on their perception whether the authorities are responsible, transparent, and trustworthy or not. Further, increasing TC needs not only power, but also trust [25; 26], and transparency [27; 28]. Thus, when taxpayers feel that the tax authority has significant taxing powers, as well as appropriate transparency and a high degree of trust, they are more inclined to comply with the law because they believe that non-com-

pliance is illegal action. Several authors and taxations experts have pointed out many factors that might affect tax compliance behavior. Nevertheless, empirical evidence from integrating economic and non-economic factors is needed [15].

With the increase of published articles on the relation between economic approach and TC, especially in the last decade, the relation between power, trust and transparency with TC is now the subject of extensive research. However, prior studies did not address the issue completely and accurately. For instance, several studies, especially in European countries such as [29; 30], provided evidence on TC but the scope was only limited to the Slippery Slope Framework. Moreover, previous studies e.g., [31; 32] adopted the Slippery Slope Framework to investigate the direct relation between power, trust and TC, however no consistent conclusion found related to the examined determinants. Thus, this review suggests that the role of trust in authorities and transparency as a mediator factor is deserved to be considered in the future model. On top of that, studying socioeconomic factors is essential in determining tax compliance behavior. Historically, the economic deterrence approaches that included in the tax compliance model have not offered a complete compliance perspective [33].

To counter the inadmissible level of tax gap, it would be important to implement a measure that will lead to enhance TC, and therefore, it is so critical to identify and bear in mind the main determinants of TC as discussed in this study. Furthermore, the practical benefit of this study is that it is useful for tax authorities and in other related financial sectors to comprehend the taxpayers’ behaviour of tax payments and establish strategies to eliminate the tax gap.

The main objective of this article is to systematically review the literature on tax compliance based on three determinants: coercive power, trust in tax authorities and transparency; and provide a direction for future research.

Hence, to achieve the purpose of the study, this review seeks to answer the following *research questions* through

a systematic literature review of related literature:

RQ1. What is the present situation of the literature on the connection between coercive power and tax compliance?

RQ2. What is the present situation of the literature on the connection between trust in tax authorities and tax compliance?

RQ3. What is the present situation of the literature on the connection between “relation transparency” and tax compliance?

This manuscript is organized into five sections, the first which is this introduction. The methodology is presented in Section 2, which includes the systematic process of the study, information source, studies selection, data recording, and the review criteria. Section 3 explains the paper’s results (search results) and lists for all of the studies that were included as tabulated in Tables 1, 2 and 3. Section 4 shows the findings of the review and suggestions for future research. Finally, Section 5 brings the paper to a close, main contributions, and limitations of the study.

2. Data and Methodology (the Protocol)

2.1. Stages of a systematic review

This study followed a systematic review protocol, which aids in gaining a full understanding of the research topic and giving more data for future investigations. Furthermore, due of its broad impact across a variety of study fields and sci-

entific disciplines, the systematic review methodology was selected as an advanced approach.

Tranfield et al. [34] published a comparative study between medicine discipline and management field about conducting a systematic review in the two mentioned fields. After the analysis for the applicability to conduct systematic review in management field, Tranfield et al. [34] proposed a set of steps as protocol, as presented in Figure 1. Based on that, this study has followed the suggested steps for review.

2.2. Data source

For information search, downloading, screening, extraction, and establishing of this review, four scientific digital databases were chosen:

1) Web of Science (WoS), which has a diverse set of manuscripts in a variety of fields such as applied sciences and social sciences.

2) Science Direct (SD) database, which provides a large number of scientific manuscripts across a variety of academic domains.

3) Scopus database, which contains multiple publishing contents connected to many and diverse disciplines of research.

4) Google Scholar, the most well-known database and comprehensive search engine for scholarly literature and academic resources.

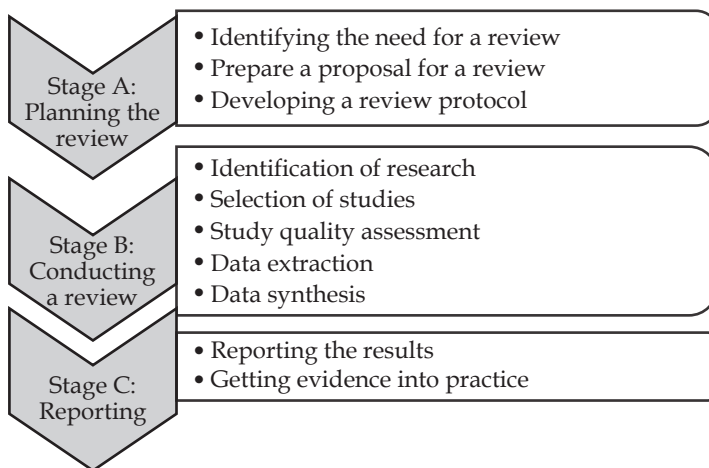


Figure 1. Stages of a systematic review (Tranfield et al. [34])

The employed search strategy in the current review was designed and summarized as in Figure. 2.

Tranfield et al. [34] designed a methodology for developing knowledge research in management field by systematic review. Tranfield et al. [34] stated that the information source for data are all the relevant resources of the search. Relevant sources will be obtained for a more in-depth analysis of the literature, and some will be selected for systematic review.

Moreover, these four databases were used which mostly are reiterated by sev-

eral researchers and authors such as [35-38]. Therefore, these databases were considered adequate and most appropriate for our review and assessment. Additional search sources were investigated and used in this research because of their importance in text analytics.

2.3. Search process

This study carried out an electronic literature search for the eligible manuscripts using four databases namely: WoS, SD, Scopus and Google Scholar. The search was conducted during 2021, to

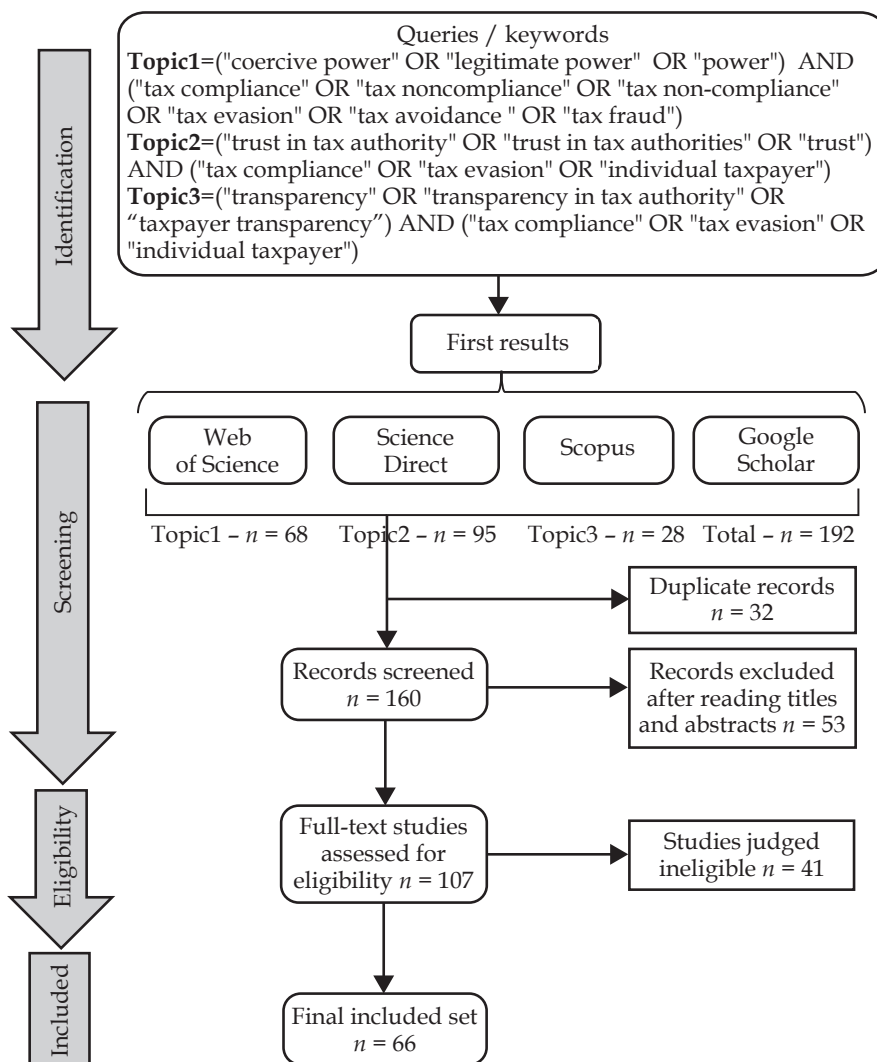


Figure 2. Flowchart of information through the different phases of a systematic review

download and draft the scientific manuscripts, the updating for recent literature was included. The search started in the identified boxes for searching in the selected databases as listed earlier. For the search the conjunctive symbols were used (e.g., AND, OR), as well as three groups of terms (keywords/queries) were employed as shown in Figure 2.

The Boolean operators were used to find the most relevant articles, because they were more practical in this review. Content was picked for searching and filters based on various sorts of published manuscripts, review articles, and conferences. This choice was beneficial in terms of covering the most recent and pertinent publications in the review's chosen topic.

2.4. Screening and study selection

The search process consisted of three steps, began with articles collecting, followed by article's title, abstract scanning and full-text reading.

The articles with the preliminary results were collected in the first step from the identified databases (WoS, Science Direct, Scopus and Google Scholar). In this step, the number of results was large, but the researchers read the results systematically until they saw no more relevant articles which then, they suffice with that much screening. After screening and comparing the collected articles $n = 32$ duplicate articles were removed.

In the second step, the relevant papers were identified in this phase by scanning their titles and abstracts. All of the publications that were extracted were thoroughly checked (reading the titles and abstracts) to see if they met the inclusion criterions.

If the paper was a match, it will be moved on to the next step. In the third step, the full-text reading was implemented, if the paper did not meet the review's criteria, it was eliminated. For the papers that met the study's inclusion criteria ($n = 66$) which gathered as the final collection, full-text reading was undertaken, and the relevant and important information was extracted (data extraction). Details about these processes will be discussed in the next section.

2.5. Data extraction and assessment

The data extraction elements in this study were formulated and identified as that author, year of publication, database for downloading, type of article, aims of the study, method, and key findings which designed to provide insights for this review. In this stage, the data was collected and extracted by assessing and summarizing the numerous attributes of each article, which were then listed and classified in proper categories utilizing an Excel software. These elements were deemed the most relevant in determining the major points of discussion for this systematic review. The operation was wrapped up with a summary table of the key information of the final collected studies.

Furthermore, the critical assessment was implemented because of its thoroughness in judging the quality of the outcomes. The topic of each study, as well as the quality of the technique, were taken into account while evaluating the results. A comparison of studies was made to highlight the important aspects, strengths, and weaknesses of each paper. Furthermore, the geographical area of the data, the methodologies employed, and the outcomes were all evaluated more thoroughly (e.g., presentation of the results, whether the final results reflect the analysis).

2.6. Inclusion criteria

In order to find the most relevant papers in the process of research selection, certain inclusion and exclusion criteria were applied. The keywords employed in the current study served as the basis for the inclusion criteria. There were no restrictions on the type of publishing or the year of publication. Only English-language papers were retained in all the databases that were chosen.

Literature review articles were included, if relevant. All research articles, conference papers, conceptual papers, and thesis dissertations are included. Besides, all relevant manuscripts such as books and official reports were identified and included if it supports the aims of this study.

The published version of a working paper was preserved in the analysis after it was published in a scientific publication. Studies that do not meet any of the criteria for inclusion were excluded.

3. Analysis and Results

The data analysis and findings are divided into four sections. Section 3.1 describes the general trend and information of studies. In Section 3.2, the first unit of analysis was utilized to analyse the current state of the literature on the relation between power and TC (RQ1) for 29 articles that studied this relationship. In section 3.3, analysis on the current state of the literature of the relation between trust and TC (RQ2) for 25 articles related to this relationship was undertaken. Finally, in section 3.4, the content analysis of 12 articles was performed to analyse the relation between transparency and TC (RQ3).

3.1. Descriptive findings of studies

The general trend and information for the review outcomes are shown in Figures 3 to 6. From Figure 3, it is apparent that the majority of studies have been in developed countries which indicates the importance of economic factors towards TC issues. In developing countries, the research is still in growing stage, but not as much as developed nations. With regards to Southeast Asia region the research is still in infancy stage which need more concern and these studies do not focus on real taxpayers as their respondents.

In Figure 4, the outcomes illustrate that most of these studies were conducted through quantitative approach, nevertheless the results were rather inconclusive. There are some studies that employed experimental method, however most of them focused on students as subjects for research. The dearth of research was

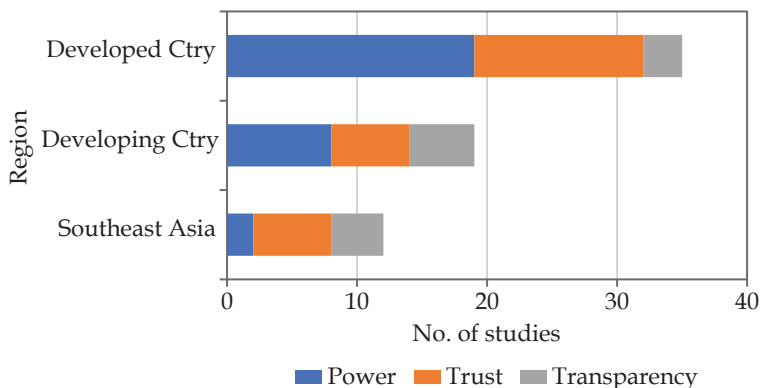


Figure 3. Distribution of studies by region

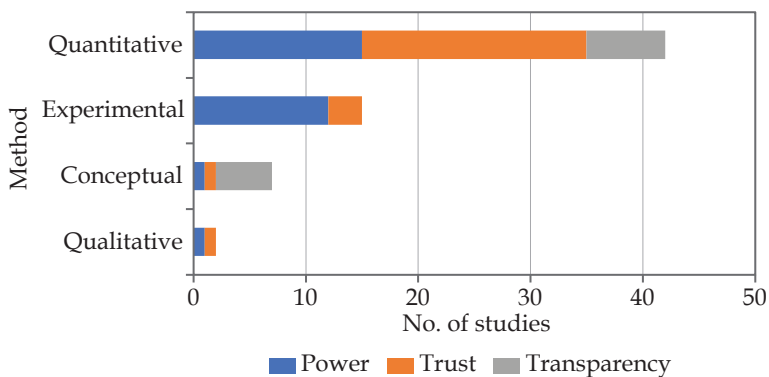


Figure 4. Distribution of studies by method

found in qualitative approach, thus more research can be taken in particular the qualitative research is the initial underpinning for upcoming research. Moreover, the inconclusive results in the quantitative approach are probably attributable to the paucity of qualitative research in order to provide a profound explanation.

The distribution of studies by publication year are shown in Figure 5. The numbers point out that a large number of studies have been published in the last five years which imply to the significant of the concerned factors in these studies. Besides, the results shown that these pointed factors are recently within concentration and could be the more related to the changes of TC phenomenon.

Finally, the last Figure (Figure 6) presents the level of the quality of studies. The dominant group of the studies was ranked in ISI index, this translating for us the quality of research and shows its importance for those interested as hot topics.

3.2. Power of tax authorities

Summary of published studies on tax compliance based on coercive power determinant is shown in Table 1.

In today’s practice and research, the connection between tax authorities and taxpayers is becoming increasingly important. Several scholars claim that enhancing the deterrent power of tax authorities, particularly the coercive power to increase ETC, can raise tax payments [7; 31]. Due to the expected effect of non-compliance is lower than the expected outcome of compliance, taxpayers are more inclined to avoid paying taxes [7; 39]. According to several studies [31; 40], enforcing compliance is achieved in case of a combined application of high power with trust.

In accordance with [41]’s conceptual approach, the model speculates on a dynamic relation between tax authorities and taxpayers to fuel cooperation in social dilemmas. This dynamic can be

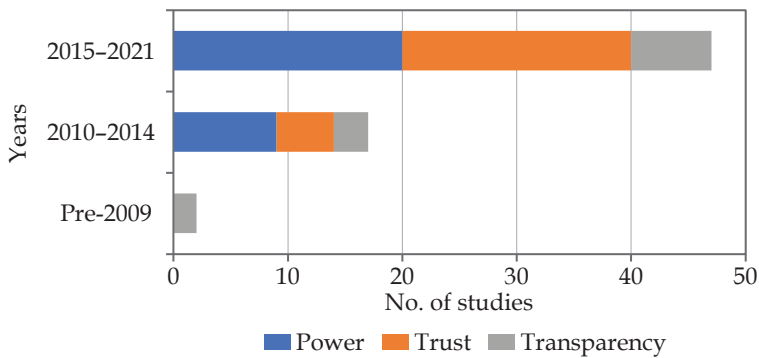


Figure 5. Distribution of studies by publication

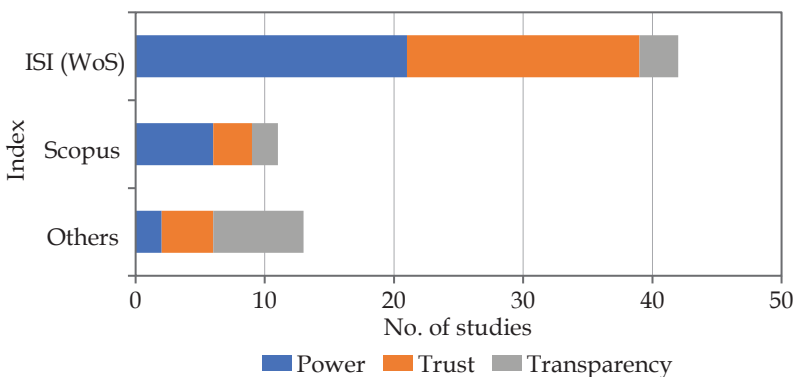


Figure 6. Distribution of studies by index

Table 1

Summary of studies on tax compliance based on coercive power determinant

Study (Year)	Theory	Approach	Name of Journal	Index
Kasper et al. (2015)	SSF	Experimental	Journal of Behavioral and Experimental Economics	ISI (WoS)
Kogler et al. (2013)	SSF	Experimental	Journal of Economic Psychology	ISI
Kastlunger et al. (2013)	SSF	Quantitative	Journal of Economic Psychology	ISI
Gangl et al. (2015)	N/A	Conceptual	New Ideas in Psychology	ISI
Faizal et al. (2017a)	SSF	Quantitative	Asian Journal of Accounting and Governance	ISI
Kaplanoglou & Rapanos (2015)	SSF	Experimental	Journal of Behavioral and Experimental Economics	Scopus
Mas'ud et al. (2015)	SSF	Quantitative	International Journal of Business and Society	ISI
Wahl et al. (2010a)	SSF	Experimental	Law & Policy	ISI
Wahl et al. (2010b)	SSF	Experimental	Law & Policy	ISI
Batrancea et al. (2019)	SSF	Experimental Scenario	Journal of Economic Psychology	ISI
Damayanti & Supramono (2019)	SSF	Experimental Scenario	Montenegrin Journal of Economics	ISI
Chong and Arunachalam (2018)	SSF	Quantitative	In Advances in Taxation	ISI
Gangl et al. (2019)	SSF	Qualitative	Frontiers in psychology	ISI
Hartl et al. (2015)		Experimental	PloS one	ISI
Gangl et al. (2020a)	SSF	Quant	Policy Studies	ISI
Dijke et al. (2019 a, b)		Quantitative	Frontiers in psychology	ISI
Hofmann et al. (2017)	SSF	Experimental	Frontiers in psychology	ISI
Hofmann et al. (2014)	SSF	Experimental	Law & policy	ISI
Mas'ud et al. (2019)		Quantitative	Economics & Sociology	ISI
Olsen et al. (2018)	SSF	Experimental	International Review of Law and Economics	ISI
Muehlbacher & Kirchler (2011)	SSF	Quantitative	European Journal of Law and Economics	ISI
Taing & Chang (2020)	TPB	Quantitative	International Journal of Public Administration	ISI
Mas'ud et al. (2015)	SSF	Quantitative	International Journal of Business and Society	Scopus
Benk & Budak (2012)	SSF	Quantitative	African Journal of Business Management	Scopus
Lozza et al. (2013)	SSF	Quantitative	Journal of Social and Political Psychology	Scopus
Gangl et al. (2020b)	N/A	Experimental	Policy Studies	Scopus
Gobena & Dijke (2016)	SSF	Quantitative	Journal of Economic Psychology	Scopus
Gangl et al. (2016)	SSF	Quantitative	Contemporary Issues in Taxation Research	Google Scholar
Rodrigues (2020)	SSF	Quantitative	Instituto Superior de Economia eGestão	Master thesis

established by elaborating the potential interaction effects of power and other economic factors in order to develop TC and committed cooperation in the improvement of public goods. Hence, the relation between tax authority and taxpayers is a significant component that forms TC behaviour [39]. The interview results generated from taxpayers and tax auditors [42] that supported the prior arguments which indicated to that tax auditors and taxpayers consider power as relationship determinant and they use this determinant to explain their tax relationships and formulating the TC behaviour.

The general trend of the results of the experimental studies in developed countries such as [40; 43] indicate that the power of the authorities leads to an improvement in TC generally. However, a few of these studies [40; 44] showed a significant impact of the power of authorities on TC. Moreover, prior studies provided that coercive power and legitimate power have the influence on TC decisions, if applied separately with the targeted compliance. For instance, legitimate power has increased VTC, but coercive power has increased ETC [45–47]. Notwithstanding the improvement in key indicators of TC, we should here refer to that most of the previous findings came from experiments on groups of students, which are not produced from actual taxpayers. Nevertheless, findings from these prior studies are still beneficial for researchers to develop TC by different approach and different groups.

The results of the survey instrument from developed countries show that voluntary cooperation by taxpayers depends on legitimate power of tax authorities while ETC depends on coercive power, and coercive power was correlated negatively with voluntary compliance [48–51]. It was also found that committed cooperation behaviour originates from a climate of confidence [47] which is characterized by reason-based trust, the effect of enforced compliance leads to at least tax avoidance and increased evasion [18]. Furthermore, the political affi-

liation has represented a significant factor in shaping TC among participants [32]. However, the analysis of the findings showed a little evidence of a significant influence on TC [32; 49; 51], probably due to the sampling method which was not clear or inappropriate to almost all survey-based studies.

This section will further discuss previous studies that were conducted in developing countries. The ability of tax authorities to reinforce compliance, forming compliance behaviour of taxpayers is a matter of interest, which in turn would lead to VTC or ETC [19; 43].

In a scenario-based experiment on Turkish taxpayers of 411 self-employed, Olsen et al. [52] found that highlighting authorities' enforcement capacity (e.g., high power) elevates intention of ETC, but induces negative emotions for the readiness to evade. A combination of high power and high trust, on the other hand, decreases negative feelings and promotes compliance intentions by reducing the willingness to avoid tax. In the same way, [53]'s result from students experiment match with [52] and show that TC is influenced by the perceptions on tax authorities' power among taxpayers. However, taxpayers present a higher TC level when they find reciprocity in trust. In this case, we comprehend that perception on tax authorities' power is important but on its own not enough to explain TC. Therefore, mutual trust is required.

In contrast of the prior debate using global cross-country data, Mas'ud et al. [21; 54] documented through pioneer empirical evidence that the power of authorities showed no influence on ETC across 37 African countries and 158 globally countries.

In a study conducted by [26] the data set was obtained from the survey questionnaire of 300 self-employed taxpayers. The result of the study confirmed the main assumptions of many past models such as [39] and [7], where they found that the power improves ETC, but only partially. Nevertheless, the result still supports the general trend of the prior studies.

Conversely to the former results, the outcomes via survey data of students and some citizens by [55] demonstrated that the power of authority did not show any significant effect on intended TC. This contrary result can be attributed to the sample used (snowball sample), and to the nature of the population which was indeterminate and unclear. Similarly, a Malaysian study by [20] used the Slippery Slope Framework as a model and investigated the determinants of intention of ETC using a mixed sample (students & taxpayers).

A survey study by quota sampling approach found the power of tax administration has influenced the intention of ETC, and the results propose that respondents will comply with their tax obligations if they consider that the tax authorities are efficient in their administration of the tax code. With opposite findings, Faizal et al. [56] revealed that coercive power has no influence on TC.

3.3. Trust in tax authorities

Summary of published studies on tax compliance based on trust in tax authority determinant is shown in Table 2. According to [19], when trust is low compared to high trust, strategic taxpaying behaviour (e.g., utilizing tax loopholes) will increase. Likewise, [7] and [25] claim that when individuals' trust in tax authorities is poor, they are more likely to try to maximize their individual results by dodging taxes, lowering compliance.

Governments, particularly tax authorities, need to encourage taxpayers to follow the law and pay their fair share of taxes in a timely manner. They can accomplish so through influencing the behaviour of taxpayers by building a trust connection with them [26]. Moreover, the public's opinion of the tax authority, as well as the wider culture of feeling responsible toward a nation, play a large role in trusting tax authority. Those who regard the tax authority as trustworthy will have their attitudes and beliefs modified or re-shaped [57; 58]. Therefore, increasing trust in the tax authorities would eliminate misconceptions about

co-paying taxes and promote voluntary compliance.

The importance of trust as a driver of TC is generally supported by conceptual evidence for example [12; 41; 59]. Some economic models like Slippery Slope Framework suggests that the social dilemma of TC can be solved by trust in authorities [7; 41]. In line with that, an experimental study using data from a 44-countries (the majority are developed countries) and students as an experiment discovered that trust in tax authorities enhances TC intentions and relaxes tax non-compliance across nations which differ in economic, cultural backgrounds and political [43] (Table 2).

TC research is progressively positing that the goodness of the connection between tax authorities and taxpayers is a critical component in determining TC [6; 7; 39]. The results of the qualitative study [42] and secondary data from 31 European & Soviet countries [60] support the prior findings from both conceptual and experimental analysis which indicate that taxpayers indeed perceive trust in authorities as determinants of the relationship and it can explain the relationship between tax authority and taxpayer. Habibov et al. [60] added that establishing trust is one of the welfare state's most important defence in preventing tax manipulation, and it works by reinforcing people's willingness to be obedient and pay more taxes.

In the tax literature from developed countries utilizing survey method, the significance of the connection between tax authorities and taxpayers, as well as the ensuing climate between the two sides, has been repeatedly emphasized. For example, [9] found that the best predictor of VTC was trust in tax authorities, but ETC was adversely associated to trust. Trust appears to hearten TC while reducing the feeling of being obliged to pay taxes. This result was corroborated by [61] who found that trust in tax authorities is a powerful predictor of overall TC, and that trust in tax authorities is a vital element in motivating individuals to voluntarily comply.

Table 2

Summary of studies on tax compliance based on trust in tax authority determinant

Study (Year)	Theory	Approach	Name of Journal	Index
Kastlunger et al. (2013)	SSF	Quantitative	Journal of Economic Psychology	ISI (WoS)
Gangl et al. (2015)	N/A	Conceptual	New Ideas in Psychology	ISI
Faizal et al. (2017a)	SSF	Quantitative	Asian Journal of Accounting and Governance	ISI
Batrancea et al. 2019	SSF	Experimental	Journal of Economic Psychology	ISI
Damayanti & Supramono (2019)	SSF	Experimental	Montenegrin Journal of Economics	ISI
Gangl et al. (2019)	SSF	Qualitative	Frontiers in psychology	ISI
Gangl et al. (2020a)	SSF	Quantitative	Policy Studies	ISI
Hofmann et al. (2020)	SSF	Experimental	Frontiers in psychology	ISI
Olsen et al. (2018)	SSF	Experimental	International Review of Law and Economics	ISI
Muehlbacher & Kirchler (2011)	SSF	Quantitative	European Journal of Law and Economics	ISI
Benk & Budak (2012)	SSF	Quantitative	African Journal of Business Management	Scopus
Lozza et al. (2013)	SSF	Quantitative	Journal of Social and Political Psychology	Scopus
Gangl et al. (2016)	SSF	Quantitative	Contemporary Issues in Taxation Research	
Gobena & Van Dijke (2017)	Fairness Heuristic Theory	Quantitative	Journal of Economic Psychology	ISI
Habibov et al. (2017)	N/A	Qualitative	International Social Security Review	ISI
Hauptman et al. (2015)	N/A	Quantitative	Journal of Local-Self Government	ISI
Kogler et al. (2015)	SSF	Quantitative	Economics of Governance	ISI
Nasution et al. (2020)	TPB	Quantitative	Entrepreneurship and Sustainability Issues	ISI
Horodnic (2018)	N/A	Review	International Journal of Sociology and Social Policy	ISI
Nurkholis et al. (2020)	SSF	Review	Cogent Business and Management	ISI
Youde & Lim (2019)	N/A	Quantitative	International Journal of Public Administration	ISI
Mardhiah et al. (2019)	SSF	Quantitative	Center for Economic Studies and ifo Institute (CESifo), Munich	Google Scholar
Rodrigues (2020)	SSF	Quantitative	Instituto Superior de Economia e Gestão	Master thesis
Alia & Ahmada (2014)	N/A	Quantitative	International Journal of Public Administration	ISI
Azmi & Aziz (2015)	Social Exchange Theory	Quantitative	Electronic Government	Google Scholar

Notwithstanding the significant role of trust in tax relationship, many studies [18; 32; 50] offered a medium role for trust (only positive direction). The findings evidenced that VTC is profoundly associated to trust, where the committed cooperation was discovered to emerge from a trust climate marked by reciprocal trust and a moral obligation to collaborate. According to the findings, lawful authorities have a direct impact on taxpayer cooperation, trust in the authorities, and the notion of a service-oriented climate. Also, the outcomes [32] showed that, political-leaning participants expressed different levels of VTC depending on the party they followed.

On the other hand, despite the sample respondents are real taxpayers, the empirical analyses of survey (online & interview) by prior studies [47; 62] indicated that trust in tax authorities was not found to be a determinant substantially associated with TC. However, the population of these two studies was from four different countries i.e., the respondents were from several cultures, thus it is quite normal to find a conflicting result. Trust in tax authority is negatively associated with ETC in the US case and not in the Ethiopian case [63]. Further, it was found that trust in tax authority is statistically significant and negatively correlated with tax non-compliance [51]. These converse results may attribute to intention as predictor, non-random sampling technique or self-reported measures. For a long time, trust has been acknowledged as a critical component of TC. Consequently, tax authorities establish a trust relationship to induce taxpayers' behaviour to comply with tax law. As a result, it is critical to know what factors influence taxpayers' attitudes about TC.

From developing countries, an Indonesian study examined 324 students using an experimental research design with regression analysis. The findings revealed that trust in tax authorities has a significant impact on TC. Surprisingly, when taxpayers have trust reciprocity, they have the highest TC [53]. In another experimental study performed by [52]

used the same technique but utilized 411 self-employed taxpayers for testing. The findings showed a positive direct impact of trust in tax authorities on VTC. Although the positive effect, the study examines behavioural intention rather than real taxpayer behaviour, thus it does not provide enough insights into taxpayers' decisions of TC.

Citizens will have trust in authorities if they believe authorities treat them with respect and if taxpayers and authorities have a mutually respectful relationship. In addition to respect, the authorities' ability to treat taxpayers fairly and transparently is essential to their credibility. Thus, the key factors that contribute to trust in authorities are respect and fair treatment of taxpayers [7; 39; 41].

Moreover, the premier suggestion by [7]'s framework accentuated that trust in authorities predicts VTC. From the foregoing literature review of the survey for developing nations, it was concluded by [64] that trust in tax authorities is pivotal in explaining TC. In particular, it was assured by [65] that in a scenario where authorities are trustworthy, VTC is at a high level. Another research revealed that trust in tax authorities boosts voluntary compliance, and that tax revenue has a close correlation to VTC [66]. However, the study by [26] failed to find evidence of the relationship of trust in tax authorities with voluntary cooperation, although the data was collected from self-employed taxpayers.

Trust in authorities is one of the crucial aspects of comprehending TC and trusting the tax authorities is expected to lead to high compliance [57]. From this point, in a survey study, trust in tax authorities has been investigated. For instance, [56] used questionnaire to investigate the effect of trust in tax authorities on VTC. The outcomes supported the prior findings from other researchers in which trust was linked to VTC. However, the questionnaires were distributed only in limited population specifically for a group of academic staff in some public and private universities which would in-

fluence the generalization of the results. Not only that, the use of academics as respondents represents a very limited category of salaried-taxpayers and ignoring other groups of taxpayers. In this regards, [25] highlighted that the intention to file a tax return is substantially correlated by trust in the tax authority. Also, the study discovered that working youngsters still had a low degree of tax literacy. However, [67] found no significance relationship for tax agents' trust of tax authorities towards their intention to continue using e-filing systems of authorities.

3.4. Relationship transparency

Summary of published studies on tax compliance based on trust in "relation transparency" determinant is shown in Table 3.

Enhancement of the relationship between tax authorities and taxpayers necessitates a grasp of taxpayer behaviour. Further the observed TC is contingent on taxpayers' willingness to participate, which also is contingent on tax authorities and taxpayers' viewpoints of tax-related phenomena being similar [68]. Increasing transparency is one technique for boosting public trust. As well as transparency regarding poor performance may, in fact, increase public-sector distrust. The most intuitive of the aspects driving confidence in tax systems is reciprocity between tax authority and taxpayers [23]. To increase TC, efforts must be made to raise the quality of tax services and transparency in the tax system [24].

Hence, it is reasonable to conclude that information transparency in tax relationships will benefit both taxpayers and

Table 3

Summary of studies on tax compliance based on "relation transparency" determinant

Study (Year)	Theory	Approach	Name of Journal	Index
Capasso et al. (2020)	N/A	Quantitative	Journal of Policy Modeling	Scopus
Adeyeye & Otusanya (2015)	TPB	Quantitative	International Journal of Economics and Accounting	Google Scholar
Kiow et al. (2017)	N/A	Review	International Business and Accounting Research Journal	Google Scholar
Noked (2018)	N/A	Conceptual	Laws	Google Scholar
Siahaan (2013)	N/A	Quantitative	Journal on Business Review	Google Scholar
Nunkoo et al. (2018)	N/A	Quantitative	Tourism Management	ISI
Meijer (2007).	N/A	Conceptual	Eur. Food & Feed L. Rev	Google Scholar
Mohamad & Othman (2013)	N/A	Conceptual	International Journal of Economics and Management Engineering	Google Scholar
Pasquier & Eyers (2016)	N/A	Conceptual	IEEE International Conference on Cloud Engineering Workshop	Scopus
Park & Blenkinsopp (2011)	N/A	Quantitative	International Review of Administrative Sciences,	ISI
Al-Maghrebi et al (2017)	TPB	Quantitative	South East Asia Journal of Contemporary Business, Economics and Law	Master Thesis
Eggert & Helm (2003)	N/A	Quantitative	Industrial Marketing Management	ISI

tax officers as tax office representatives. This means there would be no information imbalance, or unilateral control of information, which could affect the decision-making and compliance process of taxpayers and tax officials.

It is believed that transparency could give the authorities a wonderful opportunity to improve taxpayer's compliance. Taxpayers will try to avoid paying taxes if they believe the authorities is not transparent. On other hand, authorities anticipate from taxpayers to be transparent in their dealing and compliant with tax authorities' procedures and laws.

In a conceptual study [27] asked that, "Does transparency lead to more compliance?" where the author argued that transparency can have an impact on the market relationship between citizens and businesses. Because citizens have more full information on which to base their decisions, thus transparency can strengthen the market. Supported to that argument, an empirical study by [69] in marketing sector found that, relationship transparency (between vendor and customers) is greatly associated with customers' decisions, and it increased repurchase and customers' satisfaction from vendors. This information, which is made available through transparency, aids consumer decision-making, and a key underlying assumption is that transparency encourages compliance behaviour. The role of flow of information as part of transparency in enhancing compliance is supported by [70] who believed that information flow can aid in demonstrating regulatory compliance, allocating accountability, assisting investigations, and boosting transparency in general.

Regarding the influence of incomplete tax transparency on tax non-compliance, Noked [71] discussed that limited tax transparency is problematic, although increasing tax transparency is not the optimal, but can addresses tax non-compliance. Capasso et al. [72] confirm that tax transparency and tax morale have a positive link. This demonstrates that citizens are more willing to pay tax if they have a better understanding of

the fiscal framework that they are supporting. Also, the study implies that in the availability of more information, displays incentives and participation may enhance the implicit contract between the government and taxpayers, namely tax morale. According to [28], there are substantial links between government accountability, transparency, clarity, fiscal corruption reduction, and VTC. Specifically, they found that government's transparency individually or collectively impacts VTC significantly. Likewise, transparency, as a moderating factor, was found to be a crucial moderator in enhancing citizens' satisfaction and lowering corruption through its role in the process, in which corruption diminishes satisfaction [73].

On the other hand, although transparency has been found to have a major influence on citizens' reactions to authorities and on their degree of willingness, an Indonesian study on individual taxpayers working in service sector [74] revealed that there is no link between tax transparency and taxpayer voluntary compliance. Nevertheless, the study argued that tax transparency has a positive and considerable indirect influence on VTC through trust, as people will trust regulators' motives if regulators acting transparently, and they will willingly acquiesce to their choices. In this regard, the evidence by [75] on the effect of transparency on trust towards citizens compliance have supported and reinforced the arguments made by the optimistic transparency experts, where the survey results stressing that transparency in public institutions is the solution to public mistrust in the authorities.

To determine the factors that influence individual taxpayers' compliance. A review study by Kiow et al. [76] proposed that the individual taxpayers' behaviour is determined by their ethical judgments, which are further affected by government transparency. Transparent environments will boost taxpayers' compliance behaviour by increasing their trust in public authorities. Taxpayers are worried about the government's transparency in pro-

viding information, particularly when utilizing tax dollars. Inefficiency in the public sector may be hampered by a lack of transparency. On the other hand, the review also found that increasing transparency may lead to less rather than more trust since it will be easier for taxpayers to monitor authorities and they will be more likely to blame authorities for little mistakes over time.

A review by [76] was supported by the findings from a conceptual approach to [77]. Transparency is vital to guarantee the cooperative's long-term viability by providing relevant financial and non-financial facts now and in the future. Failure to communicate enough information to members and other stakeholders might lead to bad perceptions. Compliance behaviour, on the other hand, can be achieved by transparency in addition to procedure monitoring and evaluation. These conceptual consequences were further corroborated through an empirical examination from a very specific population in Selangor state by [78], where the results demonstrated that taxpayers are more likely to pay taxes if they perceive the government is more transparent in its budget and doing better. Further, the transparency in the public budget has a significant role when accompanied with tax knowledge and tax education amongst taxpayers.

What should be mentioned here along with the previous discussions are regarding the role of transparency in the connection between authorities and taxpayers. The Malaysian Tax Act 1967 stated that, tax authorities is required to provide services and information for taxpayers, fairness, integrity, and advice or assistance, which fall under the concept of transparency and responsibilities of tax authority [79]. On other side, since the tax authority is responsible, the taxpayer must bear the responsibility and must be co-operative, honest, well mannered, and behave with integrity and transparency. Moreover, providing correct and reasonable information to IRBM and assistance in keeping the supporting documents [80; 81].

4. Discussion and Suggestions for Future Research

The main objective of this systematic review sought to discover the current state of the empirical and conceptual studies on the identified three factors (power, trust, transparency) in individual tax compliance, then to give propositions for future research. The outcomes of this review show that the bulk of studies do not make extensive use of theories as a foundation for enhancing the field's credibility.

When theoretical views are used, there is an over-reliance on [7]'s model (Slippery Slope Framework), and there is no indication of innovation in expanding or embracing new theories. Based on the review, this study proposes three theoretical perspectives that are highly advantageous in the field of TC for individual taxpayers: social influence theory, social identity theory and social exchange theory as an integrative model. These three theoretical viewpoints are especially well suited to the field of TC because they primarily reflect the nature of individual taxpayers, and they also emphasize the importance of the interaction between the external factors and individuals' attitudes.

This review admits that other theories such as reasoned action theory and planned behaviour theory are cornerstone of individual behaviour theories, but they are repeatedly and commonly utilized in current tax research. As a result, concentrating on theories suggested will fill the major gaps and make a significant contribution to the field of research. Further the current systematic review uncovered the mass used of the Slippery Slope Framework to empirical investigations in TC issue. However, the evidence on using the model in the tax environment was inconclusive. In our view, the Slippery Slope Framework may not the first and most significant with the TC context. Nonetheless, the framework is valuable in serving researchers to understand taxpayer's behaviours and practices.

Overall, this systematic review emphasizes the importance of expanding and deepening the theoretical framework of research on individual taxpayer compliance, particularly through integrated models. Although this review has limited the propositions to three theoretical viewpoints, the specific theories that TC researchers can use should be carefully chosen to give support for specific research issues. Theories constructs can provide perspectives, and researchers can provide new and unique findings, if they are appropriately chosen.

We know from prior studies, the government practices by tax policy are important for taxpayers. Specifically, taxpayers act because of their understanding of these practices, ultimately their personalized understanding impacts their tax decisions. This systematic review reveals that taxpayers have motivated understanding when there are transparent practices. Thus, we suggest that by using mediating factors can provide useful research insights in the relationships between tax authorities and taxpayers. However, there is still a dearth of research in the tax transparency literature. Despite the fact that taxes researchers have showed an increased interest in recent years on government's transparency and tax transparency with tax behaviour [74; 76; 78], as far as we know, none of them has looked at the theoretical nor empirical connection of the "relationship transparency" in TC domain. Hence, further empirical research would contribute to the knowledge on TC literature.

Moreover, the existing research were quite biased due to evidence of sampling and population. For instance, in several studies in particular experimental method researchers tend to select students as respondents who are not real taxpayers, or academics and ignore other categories, so expanded research with actual taxpayers as respondents is encouraged. In addition, the investigated population of prior studies were very specific through examining only a specific area of a country that would affect the precise of results in general.

Furthermore, in order to properly comprehend concerns of TC, apart from focusing on actual taxpayers and researchers must also be more methodical in terms of the sorts of taxpayer categories included in samples, as well as precisely classify taxpayers in order to fully comprehend how and why taxpayer compliance is indeed important.

Regarding the Southeast Asia context, the empirical findings of the existing studies may be beneficial somewhat to tax authorities in Southeast Asia to comprehend the ETC amongst taxpayers and minimizing the tax gap. However, they have contained some limitations like lack of generalizability by using non-random quota sampling method which can resulted in high skewedness and kurtosis of sample and also mostly examined behavioural intention of students who are not real taxpayers [20]. Further, the results showed no significant effects [56].

Thus, more investigation is needed. In addition, many TC studies have been conducted in developed countries as discussed previously, however [82] and [43] argued that due to cultural, social, and political differences, the outcomes drawn from these studies may well not be applicable for developing nations. Moreover, different countries and individuals have different levels of compliance [29; 82]. Furthermore, almost all studies that have investigated the trust variable in TC only tested respondents' intention and utilising very small sample or group [25; 67].

Although these studies found that trust in tax authority helps to explain individual compliance behaviour, the role of trust in tax authorities into TC in developing countries particularly Southeast Asia context, has not been fully understood, thus this constitutes a path for further research using data that are more representative of the population.

To answer the research questions, this study provided a systematic review analysis. Three questions were reviewed together for their theoretical and practical importance. Based on the analysis

of the research factors, the study factors are essential as an integrative model which can shape tax compliance positively. These factors are related to the external environment of individual, such is the government policies, and tax authorities' procedures. The two types of tax compliance which are voluntary tax compliance and enforced tax compliance can be affected by the identified factors that related to the compliance behavior and characteristics. Thus, different factors may determine taxpayers' attitudes which then impact taxpayers' behavior.

5. Conclusion

To the best of our knowledge, this systematic review is the first synthesis of empirical studies exploring the three factors in individual tax compliance field employing a rigorous methodology. Primarily, the review of 66 articles proposes some progress towards better understanding of tax compliance. The economics factors in tax compliance are a worthwhile approach of research. However, there is a need to improve research quality and create more effective integration of models. The current review illustrates the diversity of tax compliance scenarios and research foci that have been examined, as well as the attractiveness of tax behaviour as a research topic. Prior studies relied on a limited set of theories, but there is still plenty of room for improvement that are uniquely applicable to tax context towards developing the existing knowledge. The current review highlighted the importance of mixed-methods and comprehensive samples in performing tax research. There are serious flaws in the methodology used in prior studies, and researchers must use effective approaches that address tax compliance issues.

Increasing the level of deterrents, as previous studies have shown, leads to inconclusive findings and would be lowering tax attitudes and, therefore, reducing tax compliance. As a result, governments can adopt non-enforcement techniques to improve taxpayers'

willingness and, consequently, their tax compliance. Hence, steps must be taken to alter formal policies not just to modernize government and improve structural economic and social conditions, but also to foster public trust. As a lack of trust in authorities negatively impacts tax compliance, thus, it is necessary to take steps to create vertical trust within tax system. This can be accomplished, for instance, by providing the citizens particularly taxpayers a sufficient information and enhancing the concept of transparency between authorities and taxpayer.

This systematic review was completed in a methodical manner, and it has a variety of strengths and weaknesses. This review included articles that were either empirical or theoretical, allowing us to cover the entire range of intellectual activity on the subject. In analyzing the papers, we took a stringent approach. The articles were extensively evaluated by the authors, ensuring that the articles assessments were more accurate. With regards to the limitations, many of the studies included in the analysis have defined and quantified tax compliance activities in various ways, which is one of the review's weaknesses. This study attempted to resolve these issues, although of that in comparing papers for the review, arguably we may have lost some detail. However, we did everything we could to evaluate what we are able to control of the subjects. Moreover, this study acknowledged the limited contribution since our review of economics factors was limited for only three factors (power, trust, transparency) on tax compliance. However, the three identified factors are the most influential and comprehensive in economics approach. This study included only English publications, and only looked at articles that had been published in electronic databases so the review may suffer from some of the common systematic review flaws, such as the omission of significant studies and a constraint on creativity and innovation due to the application of rigorous criteria.

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