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Short- and Long-Term Drivers of Tax Evasion in Iran: Evidence from a Hybrid WALS–CWT Framework

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Abstract

Tax evasion is a multifaceted issue influenced by a range of political, economic, and sociocultural factors. This study examines the dynamics of tax evasion in Iran using a hybrid methodological framework. Utilizing annual data from 1991 to 2022, we apply the Weighted Average Least Squares (WALS) approach to identify the most robust determinants of tax evasion, followed by a time-frequency analysis using Continuous Wavelet Transform (CWT) to examine their temporal behavior.

The WALS results highlight inflation as the most influential factor in driving tax evasion. Furthermore, wavelet-based analysis reveals that while economic variables exert more substantial short-term effects, social and cultural variables demonstrate more sustained, long-term impacts. This temporal distinction suggests that behavioral and value-based reforms take longer to influence taxpayer behavior than policies based on monetary incentives or punitive enforcement.

Given the variability in both the strength and timing of these influences, the findings underscore the importance of designing a multi-layered policy response. Policymakers are advised to implement an integrated strategy that combines short-, medium-, and long-term interventions, with a particular focus on non-fragile variables that consistently shape tax evasion patterns.

Highlights

- This study employs a novel hybrid WALS–CWT framework to identify and analyze short-, medium-, and long-term determinants of tax evasion in Iran.
- The results show that inflation is the most influential short-term factor, while tax morale and perceived fairness exert more substantial long-term behavioral effects on compliance.
- The findings suggest that effective tax policy requires integrated economic and behavioral reforms, combining macroeconomic stabilization with trust-building and administrative simplification.

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1. Introduction

A sustainable and equitable economy depends critically on an efficient, transparent, and inclusive tax system. Taxes serve as a stable and recurring source of public revenue, enabling governments to finance key social and economic functions such as education, healthcare, infrastructure, and defense (Elgin & Erturk, 2019). Beyond revenue generation, taxation plays a pivotal redistributive role in mitigating inequality and promoting social cohesion (Luttmer & Singhal, 2014). However, in many developing and emerging economies, tax systems suffer from low compliance and widespread tax evasion, undermining fiscal capacity and policy effectiveness (Samadian et al., 2024).

Tax evasion refers to deliberate acts by individuals or entities to intentionally reduce their tax obligations through illegal means. This may occur through underreporting income, inflating deductions, or engaging in informal transactions that escape official oversight (Ebrahim, 2022; Ghanbari et al., 2024). The consequences of tax evasion are far-reaching: it erodes state capacity, distorts market competition, deepens income inequality, and undermines trust in public institutions (Leung et al., 2019).

Multiple and often interrelated factors influence tax evasion. From an economic standpoint, excessive tax rates, inflation, macroeconomic instability, and the size of the informal economy are prominent drivers (Pappadà & Rogoff, 2023). Social variables such as tax morale, civic norms, and institutional trust also shape compliance behavior, particularly in contexts where perceptions of fairness and reciprocity are critical (Al-Asfour & McGee, 2024). Politically, low transparency, poor governance, and perceptions of corruption are closely linked to higher evasion rates. Institutional inefficiencies, such as weak enforcement, outdated infrastructure, and overly complex tax codes, further facilitate noncompliance (Ghanbari et al., 2024).

Given these multidimensional drivers, the identification and control of tax evasion determinants have become central concerns for fiscal policymakers, especially in countries striving to meet Sustainable Development Goals (SDGs) (Mohammadreza et al., 2025). Recent literature has called for analytical approaches that move beyond static models to capture the time-varying effects of tax evasion factors. For instance, while macroeconomic shocks such as inflation may exert immediate pressure on compliance behavior, cultural and social factors tend to shape tax behavior more gradually but with long-lasting effects (Saptono et al., 2024).

To address these gaps, this study applies a hybrid empirical strategy that integrates Weighted Average Least Squares (WALS) with Continuous Wavelet Transform (CWT) to investigate the dynamic effects of tax evasion determinants in Iran. WALS provides a robust framework for variable selection under model uncertainty, whereas CWT offers insight into the evolving time–frequency relationships between explanatory variables and tax evasion behavior (Karaev et al., 2024; Magnus et al., 2010). By combining these techniques, the study offers a novel and policy-relevant understanding of how economic and institutional

variables interact over time to influence tax evasion. The findings from this research are expected to help policymakers formulate comprehensive and timely tax strategies. Such strategies should not only address short-term economic fluctuations but also reinforce the tax system's long-term institutional credibility and public trust.

2. Literature Review

The literature on tax evasion has evolved along two major theoretical trajectories. The first is rooted in neoclassical economics, where tax noncompliance is framed as a rational decision under uncertainty aimed at maximizing expected utility. This perspective is most notably represented by the (Allingham & Sandmo, 1972) model, which conceptualizes tax evasion in terms of the probability of audit, the severity of penalties, and applicable tax rates. (Becker, 1968) The theory of crime also underpins this approach by treating evasion as a calculated economic crime.

However, growing empirical evidence has exposed limitations in the standard economic model, particularly its neglect of institutional, behavioral, and cultural influences. Scholars such as (Nyantakyi et al., 2024) have emphasized that taxpayer satisfaction with administrative fairness, transparency, and procedural justice significantly alters compliance behavior regardless of economic incentives. This has led to the emergence of more comprehensive frameworks that integrate both formal and informal institutions, including the PESTEL model.

The PESTEL framework, as adopted in this study, encompasses the following dimensions: Political, Economic, Social, Technological, Environmental, and Legal. This holistic perspective allows for a multidimensional analysis of tax evasion determinants. Political variables (Mohammadreza et al., 2025; Samadian et al., 2024; Torgler & Schneider, 2009), macroeconomic conditions (Saptono et al., 2024; Thomsen & Watrin, 2018), societal norms (Golnaz et al., 2021; Karimi & Potanlar, 2022), technological capacity (Al-Asfour & McGee, 2024), environmental accountability (Wang & Ye, 2024; Zhou & Su, 2025), and legal enforcement structures (Ghanbari et al., 2024) are all viewed as contributing factors.

Over the past two decades, the academic discourse on tax evasion has increasingly shifted toward the interaction among institutional quality, trust in government, and civic engagement. This transformation reflects broader developments in behavioral economics, public finance, and institutional theory. By taking into account the social and psychological aspects of decision-making, behavioral economics offers a deeper understanding. Key behavioral concepts such as tax morale (Torgler & Schneider, 2009), social norms, trust in government (Golnaz et al., 2021), and perceived fairness (Mohammadreza et al., 2025) significantly shape compliance behavior beyond purely economic incentives. Behavioral models emphasize that individuals' willingness to comply depends on moral obligations, perceived equity, and cognitive biases, particularly in

developing economies where institutional trust is fragile. Research by (Luttmer & Singhal, 2014) emphasizes the roles of intrinsic motivation, tax morale, and social comparison in explaining individual compliance decisions. In parallel, (Saptono et al., 2024) confirm that trust in government and perceived fairness are potent predictors of taxpayer behavior. Likewise, (Schneider & Savasan, 2007) demonstrate that combining audits with behavioral nudges enhances compliance more effectively than enforcement alone.

From a policy perspective, this paradigmatic shift encourages tax authorities to complement deterrence-based mechanisms with participatory governance, digital innovation, and improvements in taxpayer service. (Tabandeh & Thierry, 2010) Argue that simplifying tax codes can enhance compliance by reducing ambiguity and increasing transparency. (Chau & Leung, 2009; Saptono et al., 2024) Further argue that digital transformation in tax administration improves transparency and reduces noncompliance.

Furthermore, the dynamics of the shadow economy remain a core area of concern. Medina (Schneider & Buehn, 2018) provides updated global estimates that link tax evasion to macroeconomic volatility, labor informality, and weak regulatory enforcement. (Elgin & Erturk, 2019) Demonstrate that informality remains a persistent global issue, primarily attributed to weak enforcement and governance structures. Similarly, a strong correlation is found between tax evasion and administrative capacity in developing economies.

Recent international studies confirm the significance of non-economic drivers. (Allam et al., 2024; Nyantakyi et al., 2024) Found that tax morale, institutional trust, and civic culture have greater predictive power than traditional enforcement variables. Domestic studies corroborate this. (Karimi & Potanlar, 2022; Mohammadreza et al., 2025) Demonstrate that inflation and macroeconomic shocks influence tax evasion in Iran, while cultural factors exhibit persistent long-term effects. (Maryam et al., 2023) Emphasize the significance of governance quality, public communication, and institutional design in influencing taxpayer behavior.

This study extends the literature by adopting a dynamic time-frequency approach to disentangle the short-, medium-, and long-term influences of these multidimensional variables. It offers a methodological innovation not previously applied in the Iranian context and aligns with recent global efforts to integrate structural and behavioral factors into tax compliance research.

3. Data and Methodology

This research is exploratory. Data for tax variables were obtained from the Iranian National Tax Administration (INTA). Macroeconomic indicators, including GDP, inflation, and exchange rates, were sourced from the Central Bank of Iran and the World Bank's Development Indicators. Social and institutional indicators, including tax morale, governance, and corruption indices, were retrieved from the Worldwide Governance Indicators (WGI) and the Statistical Center of Iran. The research period covers annual data from 1991 to 2022. In this

research, the initial step is to identify the most important explanatory variables affecting tax evasion using the Weighted Average Least Squares (WALS) approach, which will then be utilized for modeling. Given that the causal relationships among variables evolve, the wavelet coherence approach has been employed to investigate the causal relationships among influential variables related to tax evasion. The choice of the hybrid WALS–CWT approach stems from its capacity to address model uncertainty while capturing both time-invariant and time-varying effects. WALS efficiently selects robust determinants from a large set of explanatory variables (Magnus et al., 2010). In contrast, CWT complements it by visualizing how these relationships evolve over time and at different frequencies (Karaev et al., 2024). Despite its advantages, the framework assumes data stationarity and may be sensitive to boundary effects, which are recognized as its methodological limitations.

Subsequently, the Weighted Average Least Squares method was employed to examine the potential variables that influence tax evasion. Therefore, the preliminary proposed variables are generally as presented in the table below:

Table 1. Variables Used in the Research

Variable Group	Symbol	Variable Name	Role
Dependent Variable	Y	Tax Evasion (Billion Rials)	Dependent
Economic Factors	X1	The ratio of Part-Time Employment to Total Active Population	Explanatory
	X2	The ratio of Self-Employment to Total Active Population (%)	Explanatory
	X3	The ratio of Retirees to Total Active Population (%)	Explanatory
	X4	The ratio of Students (School & University) to the Total Active Population	Explanatory
	X5	Average Male Wage (Million Rials)	Explanatory
	X6	Average Female Wage (Million Rials)	Explanatory
	X7	Public Budget Deficit (Billion Rials)	Explanatory
	X8	Gini Coefficient (%)	Explanatory
	X9	Trade Balance Deficit (Billion Rials)	Explanatory
	X10	Unemployment (Ratio of Unemployed to Active Population)	Explanatory
	X11	Country Population Growth	Explanatory
	X12	Agricultural Sector Tax Rate	Explanatory
	X13	Mining Sector Tax Rate	Explanatory
	X14	Industrial Sector Tax Rate (%)	Explanatory
	X15	Oil and Gas Sector Tax Rate (%)	Explanatory
	X16	Services Sector Tax Rate (%)	Explanatory
	X17	The ratio of Agricultural Value Added to GDP (%)	Explanatory
	X18	The ratio of Mining Value Added to GDP (%)	Explanatory

		X19	The ratio of Industrial Value Added to GDP (%)	Explanatory
		X20	The ratio of Oil and Gas Value Added to GDP (%)	Explanatory
		X21	The ratio of Services Value Added to GDP (%)	Explanatory
		X22	Inflation (%)	Explanatory
		X23	Exchange Rate (%)	Explanatory
		X24	Openness of Economy (%)	Explanatory
		X25	National Income Level (Billion Rials)	Explanatory
		X26	Income from Natural Resources (Billion Rials)	Explanatory
		X27	Ratio of Renting Households (%)	Explanatory
		X28	Occupation and Source of Income (Ordinal 1–20)	Explanatory
		X29	Ratio of Highly Educated Individuals (%)	Explanatory
		X30	Ratio with Secondary and Primary Education (%)	Explanatory
		X31	Ratio with Technical and Vocational Training (%)	Explanatory
		X32	The ratio of Female to Male Population (%)	Explanatory
		X33	The ratio of the Population Aged 30–49 to Total Population (%)	Explanatory
		X34	Ratio of Population Aged 50–64 to Total Population (%)	Explanatory
		X35	The ratio of Married Population to Total Population (%)	Explanatory
	Cultural Factors	X36	The ratio of Divorced Population to Total Population	Explanatory
		X37	The ratio of Widowed Population to Total Population (%)	Explanatory
		X38	The ratio of Single Population to Total Population (%)	Explanatory
		X39	Per Capita Religious Places (Number)	Explanatory
		X40	The ratio of the Population Aged 65+ to the Total Population	Explanatory
		X41	Tax Culture (%)	Explanatory
		X42	Tax Fairness (%)	Explanatory
		X43	Tax Morale (%)	Explanatory
		X44	Tax Effort (%)	Explanatory
		X45	Per Capita Employment per Household	Explanatory
		X46	Fertility Rate (%)	Explanatory
		X47	Household Size (Number)	Explanatory
		X48	Male Life Expectancy (Years)	Explanatory
		X49	Female Life Expectancy (Years)	Explanatory
		X50	Human Capital Index (Ratio of One)	Explanatory
		X51	Fairness of Tax System (%)	Explanatory
	Pol	X52	Participation Rate (%)	Explanatory

X53	Government Accountability (Range -2.5 to 2.5)	Explanatory
X54	Political Stability (Range -2.5 to 2.5)	Explanatory
X55	Government Effectiveness (Range -2.5 to 2.5)	Explanatory
X56	Regulatory Quality (Range -2.5 to 2.5)	Explanatory
X57	Rule of Law (Range -2.5 to 2.5)	Explanatory
X58	Corruption Index (Range -2.5 to 2.5)	Explanatory
X59	Tax Complexity (%)	Explanatory
X60	Business Environment Index (1 to 100)	Explanatory
X61	Privatization (Billion Rials)	Explanatory
X62	Sanctions (Binary Variable)	Explanatory

Source: *(Al-Asfour & McGee, 2024; Karimi & Potanlar, 2022; Mohammadreza et al., 2025; Saptono et al., 2024; Wang & Ye, 2024) and Research findings.*

Given differences in the scales of the research variables, we normalized the data. To calculate the tax evasion index, the currency ratio method, an indirect method, has been used. This method was first employed by (Cagan, 1958). Subsequently, in 1980, (Tanzi, 1980) developed Cagan's method within the framework of an econometric model. Following Tanzi, various studies have been conducted by (Magnus et al., 2010; Schneider & Savasan, 2007; Torgler & Schneider, 2009). In this study, the size of the underground economy has also been estimated using Tanzi's monetary method (money demand function) within the framework of cointegration analysis, employing the Vector Error Correction Model (VECM) (Karaev et al., 2024).

This estimation is performed in the first stage by including the tax burden variable. Then, without changing the estimated model's coefficients, the tax burden variable is set to zero, and the dependent variable is calculated. The product of the liquidity volume and the Difference in the dependent variable in the two aforementioned cases represents the Volume of money in circulation in the underground economy (illegal money). In the next step, legal money is obtained by subtracting the illegal money (from the previous step) from the total amount of money in circulation. Then, the velocity of money in the formal economy is calculated using the Volume of legal money and the quantity theory of money. Assuming that the velocity of money in the formal and informal sectors is equal, the size of the underground economy is obtained by multiplying the velocity of money by the Volume of money in the informal economy, using the quantity theory of money. Finally, the rate of tax evasion in the Iranian economy is calculated by multiplying the size of the underground economy by the effective tax rate.

In this section, the money-demand approach has been used to estimate the size of the underground economy. In the present research, to estimate the underground economy using a system of regression equations and based on Tanzi's demand pattern, an equation (Equation (1)) is presented.

$$\left(\frac{CuSA}{M2}\right)_t = C + \alpha_1\left(\frac{TAX}{GDP}\right)_t + \alpha_2\left(\frac{GDPr}{GDP}\right)_t + \alpha_3(rr)_t + \alpha_4(Wminr)_t + \alpha_5(efe)_t + \varepsilon_t \quad (1)$$

Where $CuSA$ is the Total banknotes and coins in circulation, $M2$ represents the Volume of liquidity, $\frac{TAX}{GDP}$ refers to the Tax burden (ratio of total tax revenues to GDP), $\frac{GDPr}{GDP}$ Is GDP per capita: Real per capita GDP, rr is the Real interest rate (real one-year loan interest rate), $Wminr$ represents Real minimum wage of labor, efe is the Difference between free market exchange rate and official exchange rate, and ε_t It is an Observation error.

In the Equation mentioned above, the relationships between the explanatory and dependent variables are expected to be as follows. Regarding the tax burden variable and its effect on the dependent variable, the argument is that, with an increase in tax burden, the incentive to evade taxes increases, and consequently, the size of the underground economy expands. An increase in real per capita output also signifies greater development in the country and a reduced reliance on cash, leading to a smaller underground economy. Given that an increase in the real interest rate increases time deposits, the denominator of the dependent variable increases, thereby reducing the size of the underground economy. In developing countries like Iran, higher wages can boost cash circulation, since wages are often paid in cash to daily workers. Regarding the variable representing the Difference between the free-market exchange rate and the official exchange rate, it is argued that with an increase in this Difference, exporters underreport the actual Volume of exports and sell the unreported foreign currency in the informal market to gain more profit.

Given the non-stationarity of the dependent variables—the real interest rate (real one-year loan interest rate) and the real minimum wage—the ARDL approach was used to estimate the model. The long-term vector is presented in the relationship and graph below.

$$\left(\frac{CuSA}{M2}\right)_t = \underbrace{0.893}_{t=4.395} + \underbrace{0.917\left(\frac{TAX}{GDP}\right)_t}_{t=3.104} - \underbrace{0.038\left(\frac{GDPr}{GDP}\right)_t}_{t=-2.648} + \underbrace{0.0193(rr)_t}_{t=5.305} + \underbrace{0.0083(Wminr)_t}_{t=1.988} + \underbrace{0.0374(efe)_t}_{t=6.994} + \varepsilon_t \quad (2)$$

Based on the coefficients and significance levels of the variables, the tax evasion graph is as follows:

Figure 1. Tax Evasion
Source: *Research findings*

4. Empirical Results

Two primary approaches exist in modeling. The first approach relies on information criteria such as Akaike, Hannan-Quinn, and Schwarz, while newer approaches rely on model averaging. In model-averaging approaches, the selection process is data-driven. In other words, unlike the previous approach, this approach includes all variables with a theoretical basis or deemed by the researcher to have a significant impact on the dependent variable. Through multiple estimations and coefficient calculations under various conditions, the model identifies the variables that affect the dependent variable, and the optimal model is derived from them. Unlike the first category of approaches, which aims to reduce the number of explanatory variables in modeling, this approach seeks to increase the number of explanatory variables, allowing the model to identify the most influential variables on the dependent variable using t-statistics and then present the optimal model based on these variables. Since a Bayesian function is used, the probability of the coefficient's impact must also be considered (Karimi & Potanlar, 2022).

$$Y = \beta_1 \Pr(\beta_1) X1 + \beta_2 \Pr(\beta_2) X2 + \cdots + \beta_{61} \Pr(\beta_{61}) X61 + \beta_{62} \Pr(\beta_{62}) X62 + \varepsilon_{it} \quad (3)$$

In addition to the impact coefficient, after using the averaging models, the number of fragile variables is removed, and the optimal model is obtained.

The objective of this section is to estimate all possible states, considering the presence of 62 variables that influence tax evasion. Accordingly, the number of non-fragile variables influencing tax evasion has been addressed to the extent that the posterior probability of these variables exceeds the 50% threshold. Based on the results, 12 examined variables had a threshold level higher than 50%. Table 2 presents the results. In these models, K is a hyperparameter that indicates which variables are most important in models of different dimensions.

Table 2. Results of Non-Fragile Variables Across Models

K	Non-Fragile Variables
K=1	Inflation
K=2	Inflation, Exchange Rate
K=3	Inflation, Exchange Rate, Tax Culture
K=4	Inflation, Exchange Rate, Tax Culture, Unemployment
K=5	Inflation, Exchange Rate, Tax Culture, Unemployment, Tax Fairness
K=6	Inflation, Exchange Rate, Tax Culture, Unemployment, Tax Fairness, Tax Effort
K=7	Inflation, Exchange Rate, Tax Culture, Unemployment, Tax Fairness, Tax Effort, Budget Deficit
K=8	Inflation, Exchange Rate, Tax Culture, Unemployment, Tax Fairness, Tax Effort, Budget Deficit, Tax Morale
K=9	Inflation, Exchange Rate, Tax Culture, Unemployment, Tax Fairness, Tax Effort, Budget Deficit, Tax Morale, Privatization
K=10	Inflation, Exchange Rate, Tax Culture, Unemployment, Tax Fairness, Tax Effort, Budget Deficit, Tax Morale, Privatization, Tax Complexity
K=11	Inflation, Exchange Rate, Tax Culture, Unemployment, Tax Fairness, Tax Effort, Budget Deficit, Tax Morale, Privatization, Tax Complexity, Ratio of Services Sector Value Added to GDP
K=12	Inflation, Exchange Rate, Tax Culture, Unemployment, Tax Fairness, Tax Effort, Budget Deficit, Tax Morale, Privatization, Tax Complexity, Ratio of Services Sector Value Added to GDP, Fairness of Tax System

Source: *Research findings*

Next, the results of wavelet coherence between variables are presented. A shift toward orange and yellow indicates a greater impact of the mentioned variables and tax evasion.

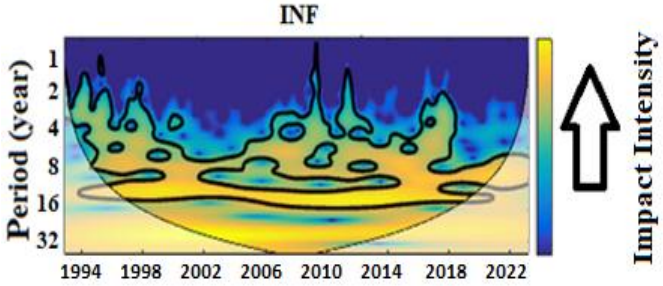

Figure 2. Wavelet Coherence Model for Inflation Variable
Source: *Research findings*

The inflation variable has a significant impact on tax evasion across most time ranges. The most important effect, in terms of time scales, is observed in the 1992-2022 period. The rise in the general price level of consumer goods significantly increases tax evasion. With rising prices, many households fall below the poverty line. Poverty and the inability to secure a minimum income

increase the incentive to engage in the underground economy, leading to greater tax evasion.

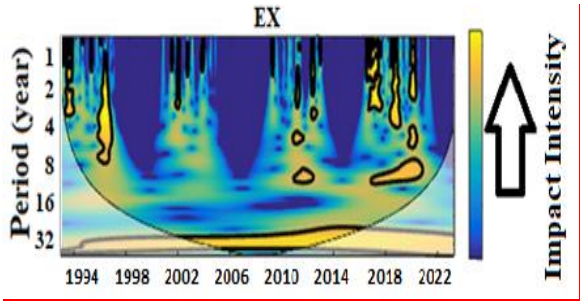

Figure 3: Wavelet Coherence Model for Exchange Rate Variable
Source: *Research findings*

The exchange rate variable has a substantial impact on tax evasion between 2000 and 2015. In terms of time scales, the effect of this variable is observable within the 1991-2022 period. The relationship between the black-market exchange rate and illegal trade has been theoretically demonstrated. In such an environment, exporters underreport their exports and sell the unreported foreign currency from these transactions on the black market to obtain a higher profit. Other essential channels for foreign currency supply in the informal market include over-invoicing of imports and the use of foreign tourists' currency. An increase in the exchange rate, through changes in the terms of trade, weakens the productive sector and the profitability of informal transactions, thereby increasing tax evasion.

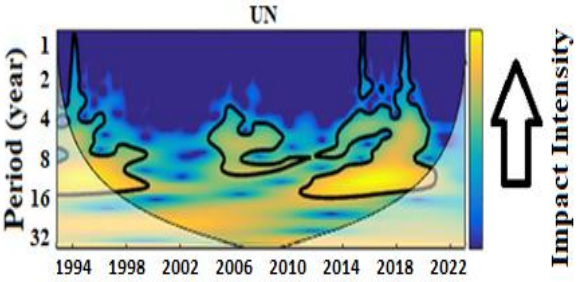

Figure 4: Wavelet Coherence Model for Unemployment Variable
Source: *Research findings*

The unemployment variable had a substantial impact on tax evasion across both 1991 to 1998 and 1999 to 2018. In terms of time scales, the effect of this variable on tax evasion is confirmed for the 1995-2007 period. Two opposing forces determine the relationship between the unemployment rate and the hidden economy; therefore, two possible predictions can be made. On the one hand, since the informal economy can be positively correlated with GDP growth, which is negatively related to unemployment, an increase in unemployment could lead to

a decrease in the informal sector. On the other hand, the second prediction holds that unemployment may be positively associated with the shadow economy. Another apparent reason for a positive causal relationship is that a significant increase in unemployment can create a strong incentive to participate in the shadow economy.

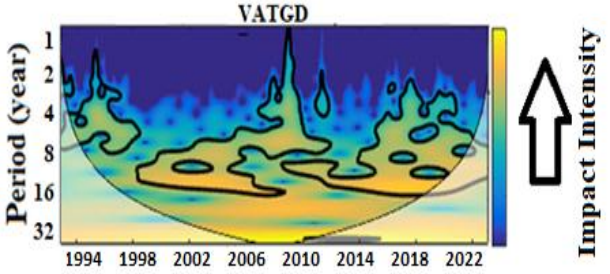

Figure 5. Wavelet Coherence Model for Services Sector Value Added to GDP Variable
Source: *Research findings*

The services sector value added to the GDP variable substantially impacted tax evasion during the years 1997-2019. Regarding time scales, this variable's impact on tax evasion is confirmed for the period from 1992 to 2009.

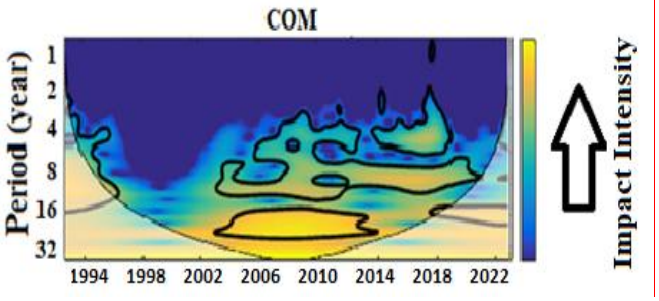

Figure 6. Wavelet Coherence Model for Tax Complexity Variable
Source: *Research findings*

The tax complexity variable has a substantial impact on tax evasion from 2001 to 2018. In terms of time scales, the effect of this variable on tax evasion is confirmed for the period from 1995 to 2022. Over time, the tax systems of many developed countries have become more complex, and this complexity is a significant factor in tax evasion. In Iran, ambiguity of laws and regulations, inefficiency of administrative structures, excessive government intervention in economic affairs, and government monopolies, alongside mismanagement, pave the way for more people to shift from the formal to the informal economy.

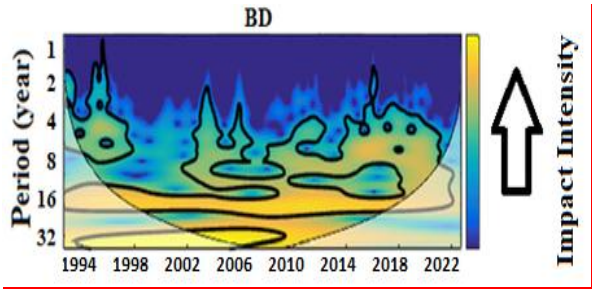

Figure 7. Wavelet Coherence Model for Budget Deficit Variable
Source: *Research findings*

The budget deficit variable had a substantial impact on tax evasion from 1991 to 2018. In terms of time scales, the effect of this variable on tax evasion is confirmed for the 1992-2009 period. A budget deficit is generally attributed to the shadow economy. Tax officials who fail to pursue legal actions in cases of tax evasion operate to the detriment of the government treasury, resulting in reduced government revenues relative to expenditures. Lower government revenues, in turn, reduce the quality and quantity of public goods and services produced. Ultimately, this results in increased tax rates for businesses and individuals. However, the decline in the quality of public goods, including public infrastructure and management, persists. The result is a stronger incentive to participate in the shadow economy. In Iran's economy, the government's budget deficit can be offset either by selling foreign currency from oil revenues in the free exchange market, which widens the disparity between the official and unofficial exchange rates, or by borrowing from the central bank and printing money, thereby increasing inflation. Both methods can lead to an expansion of the shadow economy in Iran.

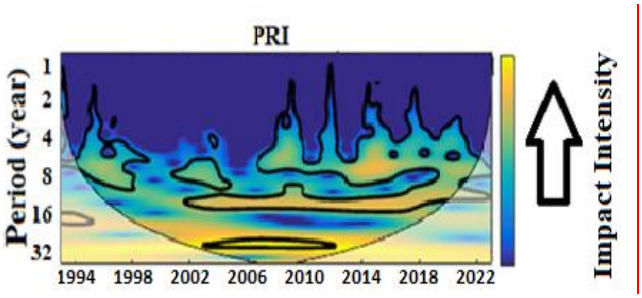

Figure 8. Wavelet Coherence Model for Privatization Variable
Source: *Research findings*

The privatization variable had a substantial impact on tax evasion from 2000 to 2019. In terms of time scales, the effect of this variable on tax evasion is confirmed for the 1995-2022 period. Economic privatization can lead to changes in macroeconomic variables, including government investment, which, as an

input to economic growth, can directly impact tax revenues. Privatization can also reduce subsidies and increase revenues from the sale of state-owned enterprises, particularly by increasing capital investment in infrastructure and reducing operational costs, thereby increasing tax revenues.

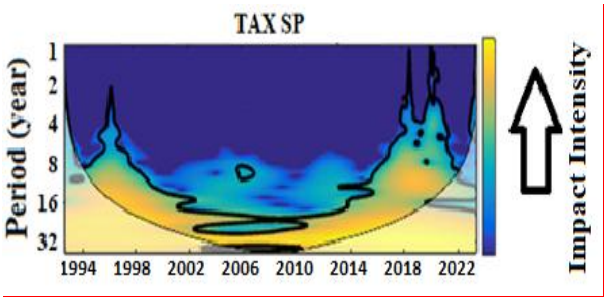

Figure 9. Wavelet Coherence Model for Tax Morale Variable
Source: *Research findings*

The tax morale variable has a substantial impact on tax evasion throughout the years 1991-2022. In terms of time scales, the effect of this variable on tax evasion is confirmed for the period from 1999 to 2022. Tax morale refers to the intrinsic motivation to pay taxes and contribute to compensating public expenditures. The intrinsic motivation to pay taxes and comply with the law is a crucial factor in tax compliance. Therefore, one reason lower-income countries have lower tax levels may be weaker tax morale among taxpayers, which has developed in high-income countries. Higher tax morale reduces tax evasion. Tax morale is influenced by elements of social capital, including attitudes towards taxation, personal, social, and national norms, perceptions of the fairness of the tax system, trust in government institutions, the nature of tax exchange between taxpayers and the government, and perceptions of the power exercised by officials.

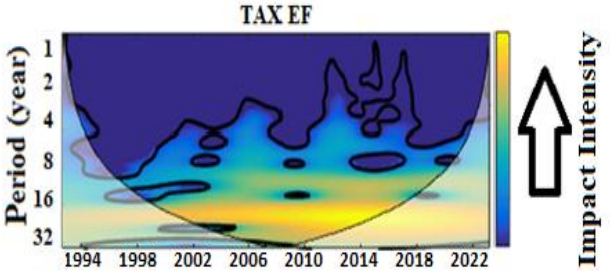

Figure 10. Wavelet Coherence Model for Tax Effort Variable
Source: *Research findings*

The tax effort variable has a substantial impact on tax evasion between 2000 and 2016. In terms of time scales, the effect of this variable on tax evasion is confirmed for the period from 1999 to 2022. Tax capacity refers to the amount of tax that can potentially be collected, given the factors influencing the tax ratio, and is calculated based on these factors. However, tax effort reflects the amount of tax collected by each country relative to its tax capacity; consequently, an increase in tax effort reduces tax evasion.

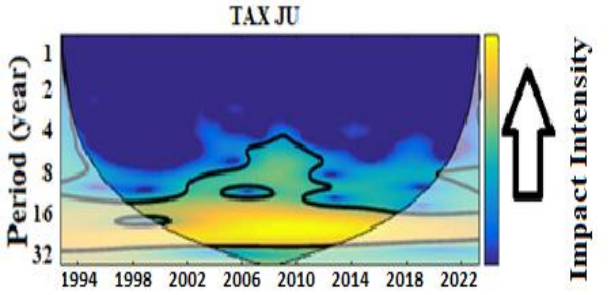

Figure 11. Wavelet Coherence Model for Fairness of Tax System Variable
Source: *Research findings*

The fairness of the tax system variable had a substantial impact on tax evasion from 1995 to 2015. In terms of time scales, the effect of this variable on tax evasion is confirmed for the period 2009-2022. Financial managers and lenders generally believe dissatisfaction is the main reason for the increase in non-receipts. The weakening of the principle of justice in the tax system reflects the fact that money is going to the taxpayer.

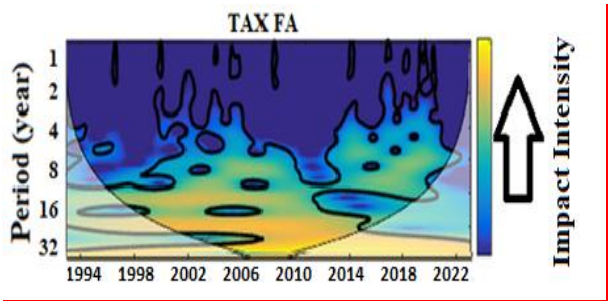

Figure 12. Wavelet Coherence Model for Tax Fairness Variable
Source: *Research findings*

The fairness of the tax system variable has a substantial impact on tax evasion between 2000 and 2012. In terms of time scales, the effect of this variable on tax evasion is confirmed for the 199-2022 period range. Tax fairness measures the distribution of the tax burden resulting from government tax policies. Examining the distribution of the tax burden among individuals is a crucial factor

in addressing tax evasion. Another component of tax fairness concerns individuals' perceptions and understanding of justice in the tax system. By improving this indicator, we anticipate a decrease in the size of the shadow economy.

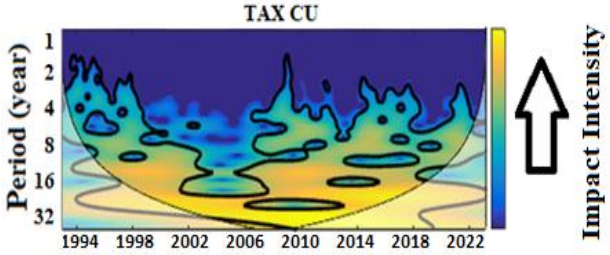

Figure 13. Wavelet Coherence Model for Tax Culture Variable
Source: *Research findings*

The tax culture variable had a substantial impact on tax evasion from 1994 to 2018. In terms of time scales, the effect of this variable on tax evasion is confirmed for the period from 1999 to 2022. Tax culture can be considered a set of attitudes, perspectives, and reactions towards the tax system. This attitude is fundamental in enforcing the law correctly and in the performance of officials. The tax culture in each country is primarily influenced by broader cultural factors and shaped by historical, geographical, political, and social factors. Political and social factors also significantly shape each country's tax culture. The tax culture factor in society refers to the social methods people use to pay taxes.

The results highlight that economic variables, such as inflation and exchange rate volatility, exert immediate and powerful effects on tax evasion, while social and cultural factors, including tax morale and fairness perceptions, influence compliance behavior over longer horizons. This finding suggests that short-term policy interventions should focus on macroeconomic stabilization, whereas long-term strategies should aim to foster a culture of tax compliance through trust and transparency. The coexistence of these dynamics underscores the importance of a coordinated and time-sensitive policy framework.

5. Conclusion

This study examined the multidimensional drivers of tax evasion in Iran using a novel hybrid approach that combines Weighted Average Least Squares (WALS) with Continuous Wavelet Transform (CWT). The integration of these methods enabled robust variable selection and dynamic time-scale analysis, revealing important insights into both the strength and temporal behavior of economic and sociocultural determinants.

The results identify inflation as the most persistent and influential economic factor driving tax evasion, with substantial short- and medium-term effects. Other macroeconomic variables, such as exchange rate volatility and unemployment,

also play critical roles but tend to fluctuate more over time. In contrast, social and institutional factors, particularly tax morale, perceived fairness, and trust in tax authorities, exert a more profound, long-term impact, shaping taxpayer behavior more gradually but with lasting effects.

The findings align with evidence from other upper-middle-income economies such as Turkey and Malaysia, where inflation and institutional quality have been found to exert similar effects on tax evasion (Schneider & Buehn, 2018; Tabandeh & Thierry, 2010). However, the stronger role of cultural and behavioral variables in Iran suggests that non-economic factors are more deeply rooted in the compliance structure of developing economies with high levels of informality.

Based on these results, several key policy recommendations are proposed:

1. Stabilize the Macroeconomy: Control inflation, exchange rate volatility, and budget deficits to reduce short-term economic pressures that drive tax evasion.
2. Promote Tax Morale and Trust: Increase transparency in public spending, strengthen institutional credibility, and foster social trust to encourage voluntary tax compliance.
3. Simplify and Digitalize Tax Administration: Streamline tax procedures, reduce legal and administrative complexity, and expand the use of digital platforms to enhance compliance efficiency.
4. Ensure Fairness and Equity: Improve perceived tax justice by balancing tax burdens across sectors and income groups and by linking tax payments to visible public services.
5. Reward Honest Taxpayers: Offer small incentives or public recognition to compliant taxpayers to reinforce positive behavioral patterns.

Author Contributions

Both authors contributed equally to the conception, design, analysis, and writing of this manuscript. Mehdi Shirafkan was primarily responsible for data analysis and interpretation, while Mojtaba Abbasian focused on literature review, methodological framework, and manuscript editing. Both authors reviewed and approved the final version of the paper for publication.

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Conflicts of Interest

The authors declare no conflict of interest.

Data Availability Statement

The data used in this study were obtained from publicly available sources, including the Central Bank of Iran, the Statistical Center of Iran, World Bank Development Indicators, Worldwide Governance Indicators, and the Iranian National Tax Administration (INTA). All datasets were compiled and processed

by the authors for research purposes. The processed data supporting the findings of this study are available from the corresponding author upon reasonable request.

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