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Designing Data-Driven Learning Environments for Tax Policymaking: A Framework Based on Tax Elasticity Analysis in Iran

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ABSTRACT

This study aims to explain the role of tax elasticity in reforming Iran's tax system and link it to an education-based approach. Tax elasticity, as a key indicator for measuring the response of tax revenues to changes in GDP, can provide an analytical basis for assessing the government's revenue-generating capacity, fiscal sustainability, and the quality of tax policymaking. Given the historical dependence of the Iranian economy on oil revenues as well as the intensification of financial constraints resulting from sanctions, chronic inflation, and economic fluctuations, the development of sustainable tax revenues has become one of the main necessities of economic governance. In this regard, the present study, using a descriptive-analytical method and a systematic review of new sources and studies, has examined the literature related to tax elasticity, tax reforms, and an education-based approach. The findings of the literature review show that the effectiveness of tax reforms depends more on expanding tax bases, digitalization, improving tax administration, reducing tax evasion, and improving analytical and institutional capacity than on increasing tax rates. This study adopts a framework development approach to design a data-driven learning environment for tax policymaking. Tax elasticity analysis is employed as an analytical foundation for generating fiscal insights that can be transformed into educational materials and simulation-based learning activities. Through a systematic review of literature on tax reforms, policy learning, and educational design, the study develops a conceptual framework linking fiscal analysis with professional learning environments. ©authors

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Introduction

In recent decades, the reduction of governments' dependence on oil revenues, increasing fiscal sustainability, and improving economic governance have made tax reform a priority for public policy (Thach, 2024). However, international experience shows that the success of tax reforms is not limited to changing rates or expanding tax bases; it also depends on the ability of policymakers and executives to generate, interpret, and apply empirical evidence about the behavior of tax revenues. In this regard, the concepts of "tax elasticity" and "tax buoyancy" are key indicators for measuring the response of tax revenues to changes in GDP, national income, and policy reforms, and can significantly enhance the capacity for revenue forecasting, policy evaluation, and the design of sustainable fiscal policies (Cornevin et al., 2023; Asgarzadeh et al, 2025).

In recent years, the Iranian economy has also faced fluctuations in oil revenues, chronic inflation, economic sanctions, the expansion of the informal economy, tax evasion, and limited public resources (Mehidi et al., 2025; Hakimi et al, 2025). In such a context, greater reliance on tax revenues has been raised as a policy necessity, but a significant part of the reforms has focused mainly on legal and administrative tools and has been based less on analytical power and organizational learning capacity to interpret the dynamics of tax revenues and use elasticity estimates in decision-making (Mukanu et al., 2023). The consequence of this gap is the emergence of deviations in the realization of projected revenues and the limited impact of reforms on goals such as tax justice, economic efficiency, and fiscal sustainability; as the literature also emphasizes, without a precise understanding of tax elasticity, reforms may have limited effect or even unintended consequences on the efficiency of the tax system (Crispoliti & Sheng, 2022; Cornevin et al., 2023; Wakoyi, 2025).

From the perspective of economics education and public policy learning, tax elasticity analysis is not just an econometric exercise; it can also be used as a "data-driven learning problem" to develop analytical thinking, evidence-based decision-making, and policy competencies (Ghashghaei et al., 2024; Kalaš et al, 2025). With the expansion of digital learning environments and active learning approaches, universities as well as tax organizations can move the teaching of elasticity and buoyancy concepts from theoretical concepts to data-driven workshops, interactive dashboards, budget simulation exercises, and problem-solving activities in online/blended learning environments. In this context, the "learning space" (whether classroom, data lab, or online environment) becomes a platform for transforming econometric results into usable knowledge for students, experts, and managers. In recent years, reforms such as the development of tax systems, the expansion of value-added tax, and the move toward data-driven taxation have been implemented in Iran; However, it is still unclear to what extent these developments have improved policymakers' and practitioners' understanding of tax revenue behavior—including elasticities—and how this evidence can be institutionalized as learnable educational content in academic programs and in-service training. Furthermore, some of the existing studies have focused solely on estimating tax elasticities and have paid less attention to designing "instructional translation" of the findings, i.e., transforming the results into learning activities, learning assessment measures, and digital educational tools. Accordingly, the present study, while estimating and analyzing tax elasticities in the Iranian economy, follows an education-oriented approach: (1) producing a data-driven learning framework/content for teaching tax elasticities analysis in the context of Iranian tax reforms, and (2) explaining how this evidence can enhance policy learning, organizational learning capacity, and the quality of tax decision-making. This approach strengthens the link between empirical research, instructional design, and tax governance improvement in a format aligned with studies of learning spaces and digital learning.

This study does not aim to empirically evaluate the effectiveness of tax education among students or policymakers. Instead, it proposes a conceptual framework for designing data-

driven learning environments in which tax elasticity indicators and fiscal analyses are transformed into educational resources for improving analytical capabilities and supporting evidence-based tax policymaking.

Literature Review

Tax elasticity, as one of the central indicators in the analysis of government revenue capacity, refers to the degree to which tax revenues respond to changes in GDP or national income, without considering discretionary changes in tax laws and policies (Yang, 2026). The importance of this concept is not limited to the field of economic measurement, but is also used at higher levels as a tool for understanding fiscal sustainability, predictability of the public budget, and assessing the performance of the tax system. In the recent literature, tax elasticity is considered not only a technical indicator for macroeconomic analysts, but also a basis for policy learning, training in public finance analysis, and improving the decision-making ability of tax managers and experts, because it allows the impact of economic growth on government revenues to be explained in an analytical, teachable, and evidence-based context (Cornevin et al., 2023; Saez et al., 2012; Ling, 2025).

In this context, recent studies have shown that an accurate understanding of tax elasticity is directly linked to the quality of the analysis, the choice of estimation method, and the ability to interpret the results. For example, Cornevin et al. (2023) found that the long-run elasticity of tax revenues is approximately equal to one for 185 countries, while the short-run elasticity is underreported in previous estimates. They also showed that the difference between tax elasticity and buoyancy is largely affected by the estimation method. This finding is of great educational importance, as it suggests that the education of economists, policymakers, and tax analysts should not be limited to the transfer of theoretical concepts alone, but should also focus on methodological literacy, the selection of appropriate techniques, and the critical interpretation of results. In this sense, the topic of tax elasticity is aligned with the goals of the IJLSS journal in the field of data-driven learning, the development of analytical skills, and the application of knowledge in professional and educational settings.

The importance of this issue becomes more prominent in developing countries, and in the Iranian economy in particular. The Iranian economy has been significantly dependent on oil revenues over the past decades, and this dependence has caused any external shock, a drop in oil prices, or restrictions due to sanctions to directly affect the government's financial capacity (Sayadi et al., 2025; Elsner et al., 2026). In such circumstances, strengthening tax capacity and increasing the share of tax revenues in the public budget has become a strategic necessity. However, challenges such as the informal economy, tax evasion, extensive exemptions, and weaknesses in identifying tax bases have prevented the full use of this capacity (Jaramillo et al., 2019; OECD, 2024). From the perspective of learning and institutional capacity development, this situation shows that tax reform is not simply a legal or executive intervention, but requires the creation of professional learning environments for managers, experts, and decision-makers to be able to make decisions about reform paths based on empirical analysis and data-driven interpretation.

In this regard, the education-oriented approach has gained an important place in the literature. This approach is based on the principle that research findings should contribute to the promotion of learning, the development of analytical skills, and the improvement of evidence-based decision-making in addition to the production of knowledge. In the field of taxation, being education-oriented means that the results of economic analyses, including the estimation of tax elasticities, can be transformed into educational content, organizational empowerment tools, and resources for policy learning and made available to policymakers, managers, experts, and students (OECD, 2023; UNESCO, 2021). This perception is also consistent with the scope of IJLSS, as the journal emphasizes areas such as innovations in education, instructional technology, web-based teaching and learning, digital curriculum, and computer-assisted learning. Therefore, research on tax elasticity is more relevant to the

goals of such a journal when it shows how analytical findings can be used to design educational content, promote professional learning, and improve the quality of decision-making in the tax system.

Traditional tax education has mainly relied on theoretical instruction, legal explanations, and static examples of taxation rules. However, the increasing complexity of modern tax systems, the availability of large-scale fiscal data, and the need for evidence-based policymaking require a transition toward interactive and data-driven learning environments. In this context, data labs and budget simulators can provide learners with opportunities to analyze real fiscal information, interpret tax performance indicators, and understand the consequences of alternative policy choices. Such environments enable learners to move beyond memorizing tax concepts toward developing practical analytical skills required for contemporary tax governance.

Active learning approaches emphasize learner engagement, problem-solving, simulation, and the application of knowledge in realistic contexts rather than passive transmission of theoretical concepts. In professional fields such as economics, public finance, and policy analysis, learning environments based on real-world data and simulations can improve analytical reasoning and decision-making capabilities. Therefore, designing tax learning environments requires integrating fiscal datasets, analytical tools, and scenario-based exercises that allow learners to explore the relationship between economic conditions and tax policy outcomes.

The literature on tax reform also reinforces this link between analytical knowledge and implementation capacity. Tax reform refers to a set of planned measures to increase the efficiency, fairness, transparency, and sustainability of revenues, which can include revisions to laws, rates, tax bases, enforcement mechanisms, and information infrastructure (Xu et al., 2023; Owais, 2026). In new approaches, the focus of reform is not simply on increasing tax rates, but also on expanding the tax base, digitizing the tax system, improving administration, reducing tax evasion, increasing taxpayer compliance, and using smart data. This orientation is particularly important from an educational perspective, as the successful implementation of such reforms requires organizational learning, improved digital literacy, and the ability to analyze and apply data at different levels of tax governance.

Adan et al. (2023) study shows that tax administration and management reforms, including digitalization, improved collection systems, and increased taxpayer compliance, significantly increase tax revenues, and in developing countries, their impact is even greater than increasing tax rates. This finding suggests that the effectiveness of tax reforms depends not only on the content of the policy, but also on the quality of implementation, expertise, and institutional capacity; all of which can be strengthened through professional education and learning. Similarly, Crispolti and Sheng (2022) also used international evidence to show that reforms that focus on broadening tax bases and eliminating unnecessary exemptions generate more sustainable revenues and have fewer negative effects on economic growth than reforms that focus on increasing tax rates. This finding also confirms that a scientific understanding of the structure of the tax system and educating decision-makers about the quality of reforms are essential for choosing effective strategies.

The OECD (2024) report also complements this discussion at the policy level. It shows that countries that have pursued structural reforms, digitalized the tax system, and reduced tax evasion have been able to increase the tax-to-GDP ratio and create greater fiscal sustainability. It also emphasizes the role of data-centricity in tax reforms. From the perspective of IJLSS, this body of literature is particularly important because data-centricity, digitalization, and the use of technology in decision-making are directly related to areas such as educational technology, instructional technology, and computer-assisted learning. In other words, tax education is no longer simply about transferring legal and economic concepts, but also includes data-driven learning, interpreting evidence, and using technological tools for analysis and policymaking.

A study by Jaramillo et al. (2019) also shows that tax reforms are most effective when implemented in conjunction with institutional reforms and improved public financial management. According to this finding, tax reforms can increase the fiscal resilience of governments to economic shocks and reduce the volatility of public revenues. This result highlights the importance of the organizational learning dimension, since institutional reform is not possible without knowledge accumulation, experience transfer, training of specialized human resources, and strengthening of analytical capabilities. From this perspective, research on tax elasticity not only helps to understand the behavior of tax revenues, but can also provide an epistemological infrastructure for educating decision-makers and designing learning-based interventions in the tax system.

In summary, the literature review shows that three main axes in this area are interconnected: first, tax elasticity as an indicator for measuring the capacity and sustainability of tax revenues (Yang, 2026; Cornevin et al., 2023; Saez et al., 2012); Second, tax reform as a set of structural, operational, and data-driven interventions to improve tax system performance (Xu et al., 2023; Crispolti & Sheng, 2022; Adan et al., 2023; OECD, 2024; Soltanifar et al, 2025); and third, a learning-based approach that emphasizes that the results of these analyses should lead to professional learning, enhance analytical skills, and improve decision-making in real tax governance environments (OECD, 2023; UNESCO, 2021; Jin et al, 2025). Such a summary is also consistent with the scope of the IJLSS journal, as it focuses on the role of technology, educational innovation, learning environments, and the development of knowledge and skill capacities in solving real-world problems.

Despite the relative richness of the literature on tax elasticity, tax reform, and the effects of management and digitalization on government revenues, there is still an important research gap: the majority of existing studies have focused on econometric estimates, cross-country comparisons, or policy evaluations, and have rarely addressed the question of how the results of these analyses can be translated into educational frameworks, organizational learning, and professional capacity development for policymakers, experts, and students. Particularly in the Iranian context, where the tax system faces numerous structural, institutional, and informational challenges, there is a noticeable lack of research that simultaneously examines the relationship between tax elasticity and tax system reforms and shows how these findings can be used to design educational content, improve evidence-based decision-making, and strengthen institutional capacity.

Tax elasticity analysis can be understood not only as a quantitative instrument for evaluating the responsiveness of tax revenues to economic growth but also as a mechanism for generating policy knowledge (Keyes, 2024). Traditional applications of tax elasticity primarily focus on measuring fiscal performance and assessing the capacity of tax systems to generate sustainable revenues. However, the interpretation of elasticity indicators provides deeper insights into structural weaknesses, institutional inefficiencies, and potential reform priorities within a tax system. For example, a low level of tax elasticity may indicate limitations in tax base diversification, weaknesses in tax administration, insufficient digital infrastructure, or high levels of tax avoidance. Therefore, elasticity measures serve as diagnostic information that enables policymakers and tax institutions to learn from existing performance patterns and identify areas requiring improvement. In this perspective, tax elasticity analysis becomes a knowledge-generation process that transforms fiscal data into actionable insights for improving tax governance (Ridwan et al, 2025; Abdulwahab, 2026).

Within a learning-based policymaking framework, the outputs of tax elasticity analysis contribute to organizational learning, capacity development, and evidence-based decision-making. The continuous evaluation and interpretation of elasticity indicators allow policymakers, tax administrators, and professional experts to develop a deeper understanding of how economic conditions, administrative practices, and institutional arrangements influence tax performance. This knowledge can be incorporated into training programs, professional development initiatives, and policy-learning environments, where

analytical findings are converted into competencies for designing and implementing effective tax reforms. Accordingly, the relationship between tax elasticity analysis and education-based policymaking is established through a learning cycle: measurement of tax performance, interpretation of fiscal signals, knowledge dissemination, development of analytical capabilities, and application of evidence in reform decisions. Thus, tax elasticity analysis functions as a bridge between economic assessment and institutional learning, supporting the transition from reactive tax policies toward adaptive, sustainable, and evidence-driven tax system reforms.

Method

The present study uses a two-stage approach. In the first stage, tax elasticities and revenue effects of tax system reforms in the Iranian economy are estimated using a dynamic simultaneous equations econometric model. In the second stage, the results of the econometric estimates are interpreted in the form of a learning-based framework for learning tax policymaking. This framework is designed to enhance learners' ability to analyze tax evidence, interpret the relationship between tax bases and tax revenues, and evaluate the impact of tax reforms.

In this study, the dynamic simultaneous equations econometric model of taxation, which was used by Jaber Hadahi (published by the World Bank) to estimate tax elasticities and revenue effects of DTM in Malawi and Mauritius, is used with extensions and modifications based on the country's tax structure. As explained, sectoral tax revenue is directly affected by changes in the tax system and its tax base. To mathematically express the above relationship, Singer (1968) expresses the following formula as the initial formula for the effect of structural factors on the components of tax revenues:

(1)

$$\ln T_{it} = \alpha_i + \beta_i \ln X_{it} + \gamma_i S_{it} + U_{it}$$

Where: X_i is the tax base of the i -th tax sector, T_i is the tax revenue of the i -th sector, and S_i is the proxy variable for changes in the tax system of the i -th sector.

A point that should be noted in equation (1) is the presence of a proxy variable for the tax system (S_i), which includes changes in the tax administrative system, tax collection efficiency, tax exemptions, and tax rates. In the absence of this variable in the model, as pointed out by Chaudhry (1975), Zubair Khan (1973), Mansfield (1972), and Hadaei (1990), its effects will be implicitly shown in the elasticity of the tax base and the elasticity estimate will be biased. Various studies have been conducted with different criteria to determine the best substitute for S_i . For example, Zubair Khan (1973) in a study he conducted for Pakistan used a dummy variable as a substitute for changes in the tax system in the form of equation (2):

$$\ln T = \alpha + \beta \ln Y + d_1 D_1 + d_2 D_2 + \dots + d_n D_n$$

Where: T is tax revenue, Y is tax base and D_i are dummy variables.

The problem with this method is that the model may suffer from a collinearity problem. 1

In studying the elasticity of the Malaysian tax system, Chaudhry (1975) used the method of constructing series with a fixed tax rate. In this way, the effective tax rates for each income group are calculated in the base year and by applying these rates to the income groups corresponding to all years, a series with a fixed rate structure is created. The time series of the aforementioned variable is determined using equation (3).

(3)

$$T(t) = \sum_{i=0}^n \theta_i(r) Y_i(t) \quad (3)$$

Where: $Y_{i(t)}$ is the tax base in group i at time t ,

$T(t)$ is the total income in a series with a fixed rate structure at time t , r is the base year, and

$\theta_i(r) = \frac{T_i(r)}{Y_i(r)}$ is the average effective tax rate in group i in the base year r .

After obtaining the fixed rate tax series using equation (3), he used the following equation to estimate tax elasticity:

$$\ln(t) = a + \lambda \ln X_t - 1$$

X_{t-1} : The tax base of the previous year

This method requires the rates of different tax income classes and also requires accurate information about the distribution of tax class bases.

Studies published between 2000 and 2025 were considered because this period covers major developments in digital taxation, fiscal governance, and evidence-based policymaking.

In Iran, tax elasticity has been affected by structural characteristics of the economy, including oil dependency, inflationary pressures, economic volatility, and limited tax base diversification. Although nominal tax revenues have increased in recent years, this growth does not necessarily indicate improved elasticity because inflation and changes in tax rates may distort revenue performance. Therefore, elasticity analysis provides a more meaningful assessment of the underlying capacity of the tax system.

The present research follows a framework development and conceptual modeling approach. The study does not involve experimental intervention, implementation of training programs, or empirical evaluation of learners' performance. Instead, the objective is to design a theoretical framework that explains how tax elasticity analysis can be incorporated into data-driven learning environments. The proposed framework is developed through a review of theoretical foundations in tax analysis, policy learning, and educational design principles.

The quantitative data used in the tax elasticity analysis were obtained from official national and international databases, including Iran's Statistical Center, the Ministry of Economic Affairs and Finance, the Iranian National Tax Administration, and World Bank indicators. The dataset includes annual macroeconomic and fiscal variables such as tax revenues, gross domestic product (GDP), and related economic indicators. The analysis was conducted using MATLAB based on the tax elasticity estimation approach. The estimation procedure involved calculating the responsiveness of tax revenues to changes in economic activity using the elasticity coefficient framework. The results were subsequently interpreted as analytical inputs for the proposed tax learning environment.

Findings

The analysis of the findings of this study is presented in two parts. In the first part, the descriptive results and reliability tests of the variables are reported. In the second part, the results of the estimation of the dynamic simultaneous equations system are presented and its analysis is explained in the form of "interpretive codes and policy learning" to determine how these empirical findings can be used as learning content in educational spaces and organizational capacity development of tax institutions.

In the present study, we seek to estimate the model and examine the tax elasticities by focusing on the effects of changing the tax system to achieve the research objectives, which include
1- measuring the elasticities of sectoral tax revenue, sectoral tax bases, and total tax revenue
2- measuring the direct and indirect responses of each sectoral tax revenue to changes in its own tax systems and other sectoral tax systems. For this purpose, first, to estimate the elasticities of sectoral tax revenue and sectoral tax bases in the short run, equations one to six are estimated as a system of simultaneous equations as follows, and the short-term elasticities of sectoral tax revenue are extracted and analyzed. The models in this section are as follows:

$$\begin{aligned}\log(T_c)_t &= \lambda_c \alpha_{c0} + \lambda_c \alpha_{c1} \log(X_c)_t + (1 - \lambda_c) \log(T_c)_{t-1} + \lambda_i \alpha_{c2} (r_c(1 + g_c)/(1 + \lambda_c \alpha_{c1} g_c))_t + \lambda_c \varepsilon_{ct} \\ \log(T_j)_t &= \lambda_j \alpha_{j0} + \lambda_j \alpha_{j1} \log(X_j)_t + (1 - \lambda_j) \log(T_j)_{t-1} + \lambda_j \alpha_{j2} (r_j(1 + g_j)/(1 + \lambda_j \alpha_{j1} g_j))_t + \lambda_j \varepsilon_{jt} \\ \log(T_w)_t &= \lambda_w \alpha_{w0} + \lambda_w \alpha_{w1} \log(X_w)_t + (1 - \lambda_w) \log(T_w)_{t-1} + \lambda_w \alpha_{w2} (r_w(1 + g_w)/(1 + \lambda_w \alpha_{w1} g_w))_t \\ \log(T_o)_t &= \lambda_o \alpha_{o0} + \lambda_o \alpha_{o1} \log(X_o)_t + (1 - \lambda_o) \log(T_o)_{t-1} + \lambda_o \alpha_{o2} (r_o(1 + g_o)/(1 + \lambda_o \alpha_{o1} g_o))_t \\ \log(T_d)_t &= \lambda_d \alpha_{d0} + \lambda_d \alpha_{d1} \log(X_d)_t + (1 - \lambda_d) \log(T_d)_{t-1} + \lambda_d \alpha_{d2} (r_d(1 + g_d)/(1 + \lambda_d \alpha_{d1} g_d))_t\end{aligned}$$

$$\log(T_m)_t = \lambda_m \alpha_{m0} + \lambda_m \alpha_{m1} \log(X_m)_t + (1 - \lambda_m) \log(T_m)_{t-1} + \lambda_m \alpha_{m2} (r_m (1 + g_m) / (1 + \lambda_m \alpha_{m1} g_m))_t + \lambda_m \varepsilon_{mt}$$

Next, to measure the direct and indirect responses of each sectoral tax revenue to changes in its own tax systems and other sectoral tax systems and to measure the long-run elasticity of T_i to GDP and the long-run response of T_i to a percentage change in S_j (for $j=m, d, c, j, w, o$) by considering the lagged dependent variables as endogenous variables, the structural form of the model is a system of differential equations, the final form of the model is estimated as follows:

$$Y_t = [I + B^{-1}C]^{-1}[-B^{-1}A] + [I + B^{-1}C]^{-1}[-B^{-1}D](X)_t$$

In this equation, each endogenous variable is a function of all exogenous variables $[Ln(GDP)_t$ and S_i] included in the model. The ij th element of $\{[I+B^{-1}C]^{-1}[-B^{-1}D]\}$ measures the total effect of a one-unit change in the j th exogenous variable on the i th endogenous variable (the total multiplier). For example, the i th sector tax revenue equation in its final form would be:

$$Ln(T_i)_t = \varphi_{i0} + \varphi_{i1} Ln(GDP)_t + \sum \varphi_{ij2} (S_j)_{t-1} \text{ for } j=m,d,c,j,w,o$$

Where

φ_{i1} - long-run elasticity of T_i to GDP

φ_{ij2} = long-run response of T_i to a percentage change in S_j

The elements $\{[I+B^{-1}C]^{-1}[-B^{-1}D]\}$ which are related to the coefficients $Ln(GDP)_t$ (long-run partial and total tax elasticities) and S_i (direct and indirect responses of tax revenues to DTMs in the long run) are presented in the models below.

$$\begin{aligned} Ln(T_d)_t &= \varphi_d + \varphi_d LnGDP_t + \varphi_d (S_d)_{t-1} + \varphi_m (S_m)_{t-1} + \varphi_c (S_c)_{t-1} + \varphi_j (S_j)_{t-1} + \varphi_w (S_w)_{t-1} + \varphi_o (S_o)_{t-1} + \varphi_d \varepsilon_{dt} \\ Ln(T_m)_t &= \varphi_m + \varphi_m LnGDP_t + \varphi_d (S_d)_{t-1} + \varphi_m (S_m)_{t-1} + \varphi_c (S_c)_{t-1} + \varphi_j (S_j)_{t-1} + \varphi_w (S_w)_{t-1} + \varphi_o (S_o)_{t-1} + \varphi_m \varepsilon_{dt} \\ Ln(T_c)_t &= \varphi_c + \varphi_c LnGDP_t + \varphi_d (S_d)_{t-1} + \varphi_m (S_m)_{t-1} + \varphi_c (S_c)_{t-1} + \varphi_j (S_j)_{t-1} + \varphi_w (S_w)_{t-1} + \varphi_o (S_o)_{t-1} + \varphi_c \varepsilon_{dt} \\ Ln(T_j)_t &= \varphi_j + \varphi_j LnGDP_t + \varphi_d (S_d)_{t-1} + \varphi_m (S_m)_{t-1} + \varphi_c (S_c)_{t-1} + \varphi_j (S_j)_{t-1} + \varphi_w (S_w)_{t-1} + \varphi_o (S_o)_{t-1} + \varphi_j \varepsilon_{dt} \\ Ln(T_w)_t &= \varphi_w + \varphi_w LnGDP_t + \varphi_d (S_d)_{t-1} + \varphi_m (S_m)_{t-1} + \varphi_c (S_c)_{t-1} + \varphi_j (S_j)_{t-1} + \varphi_w (S_w)_{t-1} + \varphi_o (S_o)_{t-1} + \varphi_w \varepsilon_{dt} \\ Ln(T_o)_t &= \varphi_o + \varphi_o LnGDP_t + \varphi_d (S_d)_{t-1} + \varphi_m (S_m)_{t-1} + \varphi_c (S_c)_{t-1} + \varphi_j (S_j)_{t-1} + \varphi_w (S_w)_{t-1} + \varphi_o (S_o)_{t-1} + \varphi_o \varepsilon_{dt} \end{aligned}$$

After estimating the above equations as a system of simultaneous equations, and extracting the long-run elasticity of T_i relative to GDP and the long-run response of T_i to a percentage change in S_j , the following equations are then estimated as a system of simultaneous equations to measure the elasticities of sectoral tax bases.

$$\begin{aligned} \ln(X_d)_t &= \beta_{d0} + \beta_{d1} \ln(Y_d)_t + \beta_{d2} \left[\frac{s_m[(1+g_m)/(1+a_{m1}g_m)]}{s_d[(1+g_d)/(1+a_{d1}g_d)]} \right]_t + v_{dt} \\ \ln(X_m)_t &= \beta_{m0} + \beta_{m1} \ln(GDP)_t + \beta_{m2} \left[\frac{s_m[(1+g_m)/(1+a_{m1}g_m)]}{s_d[(1+g_d)/(1+a_{d1}g_d)]} \right]_t + \beta_{m3} \left[\frac{s_c(1+g_c)}{(1+a_{c1}g_c)} \right]_t + v_{mt} \\ \ln(X_c)_t &= \beta_{c0} + \beta_{c1} \ln(GDP)_t + \beta_{c2} \left[\frac{s_c(1+g_c)}{(1+a_{c1}g_c)} \right]_t + \beta_{c3} \left[\frac{s_m[(1+g_m)/(1+a_{m1}g_m)]}{s_d[(1+g_d)/(1+a_{d1}g_d)]} \right]_t + v_{ct} \\ \ln(X_j)_t &= \beta_{j0} + \beta_{j1} \ln(GDP)_t + \beta_{j2} \left[\frac{s_j(1+g_j)}{(1+a_{j1}g_j)} \right]_t + \beta_{j3} \left[\frac{s_m[(1+g_m)/(1+a_{m1}g_m)]}{s_d[(1+g_d)/(1+a_{d1}g_d)]} \right]_t + v_{jt} \\ \ln(X_w)_t &= \beta_{w0} + \beta_{w1} \ln(GDP)_t + \beta_{w2} \left[\frac{s_w(1+g_w)}{(1+a_{w1}g_w)} \right]_t + v_{wt} \end{aligned}$$

Finally, to measure the elasticity of total tax revenue, the following models are estimated.

$$\begin{aligned} \ln(T)_t &= \delta_0 + \delta_c \ln(T_c)_t + \delta_j \ln(T_j)_t + \delta_w \ln(T_w)_t + \delta_o \ln(T_o)_t + \delta_d \ln(T_d)_t + \delta_m \ln(T_m)_t \\ \ln(Yd)_t &= \gamma_0 + \gamma_1 \ln(GDP)_t + \gamma_2 \ln(T_c)_t + \gamma_3 \ln(T_j)_t + \gamma_4 \ln(T_w)_t + \gamma_5 \ln(T_o)_t \\ (s_m/s_d)_t &= \theta_0 + \theta_1 (s_m)_t + \theta_2 (s_d)_t \end{aligned}$$

Model variables

The variables of the model equations include endogenous variables, exogenous variables, and predetermined variables as follows.

a) Endogenous variables include

T_d = Domestic transaction tax

T_m = Import tax

T_c = Corporate income tax

T_j = Business income tax

T_w = Payroll tax

T_o = Other direct taxes

X_d = Consumption and sales tax base

X_m = Import tax base
 X_c = Corporate tax base
 X_j = Business tax base
 X_w = Payroll tax base
 T = Total tax revenue
 Y_d = Disposable income
 Sm/Sd = Indirect tax system ratio

b) Exogenous variables

X_0 GDP = Gross domestic product
 S_i = Average effective tax rate in sector i ($sm, sd, so, sj, sw, sc,$)

c) Predetermined exogenous variables

$(T_j)_{t-1}, (T_m)_{t-1}, (T_d)_{t-1}, (T_o)_{t-1}, (T_c)_{t-1}, (T_w)_{t-1}$, = Sectoral tax revenues with a lag

According to the data presented in Table (1), the descriptive analysis of the main indicators of the study is presented as follows. It should be noted that all variables are considered in the form of natural logarithms (Log), therefore, the interpretation of statistics is based on logarithmic values.

The econometric estimations presented in this study are not considered as final policy outputs alone; rather, they represent analytical inputs for the proposed tax learning simulator. By incorporating elasticity results into a training environment, learners can examine how changes in economic growth, tax bases, and administrative policies influence tax revenue performance. Therefore, mathematical outputs serve as learning objects that support interpretation, scenario analysis, and evidence-based decision exercises.

Descriptive analysis and reliability of variables

According to the data presented in Table 1, the descriptive analysis of the main indicators of the study is presented as follows. It should be noted that all variables are considered as natural logarithms ($\ln$), so the interpretation of the statistics is based on logarithmic values.

Table 1. Descriptive statistics of the main indicators of the study (period 1989-2024)

Name and number of variables		Dispersion indices			Central indicators	
Name	Symbol	Standard deviation	Minimum	Maximum	Median	Average
Total tax revenue	T	0.990362	3.074762	6.519401	5.154988	4.946474
Domestic transaction tax	Td	2.685005	5.184100	13.97350	9.555600	9.450364
Import tax	Tm	2.031899	5.857100	12.41970	10.49000	9.848212
Business income tax	Tj	1.984776	4.739754	12.04728	8.746557	8.601593
Wage tax	Tw	1.005895	1.952341	5.569055	3.919653	3.877669
Corporate income tax	Tc	2.307258	5.829210	13.24379	10.16691	10.12574
Other direct taxes	To	1.007269	2.063059	5.430441	4.123218	3.831109
Consumption and sales tax base	Xd	2.035329	9.917100	17.08260	13.71760	13.60989
Import tax base	Xm	2.241861	8.429800	16.46400	13.02460	12.66296
Corporate tax base	Xc	2.209020	8.932689	16.78875	13.79350	13.31474
Business tax base	Xj	2.035323	9.917146	17.08255	13.71764	13.60990
Salary tax base	Xw	0.911815	3.581950	6.758055	5.315517	5.305191
Gross domestic product	GDP	0.937983	4.435082	7.814664	6.307476	6.204402

The descriptive statistics indicate significant fluctuations in tax variables and related bases during the period under study (1989-2024). The wide range of changes in the variables indicates structural changes in the Iranian economy and tax laws over the past three decades, which provides a suitable experimental context for challenging the subjective assumptions of learners in the field of tax policymaking.

In this study, the Phillips-Perron (PP) test was used to examine the stationarity of the variables:

Table 2. Results of the PP test on the model variables

Variable	Reliability level	Probability Level	Statistic value	Abbreviation symbol
Total tax revenue	I(1)	-6.63252	0.00000	T
Domestic transaction tax	I(1)	-3.47895	0.00790	Td
Import tax	I(1)	-3.63547	0.01090	Tm
Business income tax	I(1)	-4.39865	0.00130	Tj
Wage tax	I(1)	-3.78561	0.01290	Tw
Corporate income tax	I(1)	-3.63985	0.03060	Tc
Other direct taxes	I(1)	-8.78965	0.00000	To
Consumption and sales tax base	I(1)	-5.78965	0.00000	Xd
Import tax base	I(1)	-6.78965	0.00000	Xm
Corporate tax base	I(1)	-8.179899	0.0000	Xc
Business tax base	I(1)	-12.07902	0.0000	Xj
Salary tax base	I(1)	-3.791821	0.0031	Xw
Gross domestic product	I(1)	-15.32760	0.0000	GDP

The results of the Phillips Perron test on the research variables are presented in the table above.

The null hypothesis of this test is the inconsistency of the variables. As can be seen from the table above, the null hypothesis of this test is confirmed at the 95% level, so all variables were differentiated and all variables were found to be stable with one differentiation.

Next, the results of the model estimation in the case of a simultaneous equation system are examined, and the results are given in the table below.

Table 3. Results of model estimation using the simultaneous equation system method

	Coefficient	Standard deviation	t-statistic	Probability level
C(1)	0.367572	0.037146	9.895308	0.0000
C(2)	0.078501	0.016928	4.637255	0.0000
C(3)	0.333360	0.090453	3.685438	0.0003
C(4)	0.160906-	0.066719	2.411716-	0.0159
C(5)	0.028200-	0.057200	0.492440-	0.6226
C(6)	0.075515	0.014599	5.172592	0.0000
C(7)	0.467329	0.010074	46.38888	0.0000
C(8)	0.402044-	0.076426	5.260595-	0.0000
C(9)	0.017235	0.005165	3.336878	0.0009
C(10)	0.367572	0.037146	9.895308	0.0000
C(11)	0.566291	0.022148	25.56822	0.0000
C(12)	0.088650-	0.050020	1.772362-	0.0769
C(13)	0.525900	0.034886	15.07468	0.0000
C(14)	0.117919	0.027292	4.320632	0.0000
C(15)	0.979800	0.289830	3.380603	0.0008
C(16)	0.467329-	0.010074	46.38888-	0.0000
C(17)	0.132835-	0.020027	6.632788-	0.0000
C(18)	0.402044	0.076426	5.260595	0.0000
C(19)	1.210418	0.095113	12.72610	0.0274
C(20)	0.220084-	0.011812	18.63177-	0.0000
C(21)	0.555238	0.254734	2.179676	0.0297
C(22)	0.078501	0.016928	4.637255	0.0000
C(23)	0.017235	0.005165	3.336878	0.0009
C(24)	0.173019-	0.072536	2.385275-	0.0174

The proposed tax learning space can be implemented through tax clinics, professional training centers, or online learning platforms. In this environment, learners interact with real or simulated fiscal datasets and perform analytical tasks related to tax system performance. The learning process consists of several stages: understanding tax indicators, analyzing elasticity results, interpreting fiscal challenges, evaluating alternative reform scenarios, and developing evidence-based recommendations. For example, a learner may use elasticity estimates to examine how expanding a specific tax base or improving administrative efficiency could affect future government revenues. Through this process, the learning environment connects theoretical knowledge with practical policymaking skills.

The results of estimating the model for Iran using the simultaneous equations system show that the coefficients of most variables are significant, their signs are expected and in accordance with the theoretical foundations of the subject. The estimated relationships are analyzed as follows.

C (1): The width from the origin of the first model is for corporate income tax, C (2): Short-term sectoral tax revenues in corporate income tax, C (3): Elasticity of the corporate income tax base relative to corporate income tax, and C (4): Average effective tax rate in the corporate income sector.

Based on the findings, the coefficient of the lagged variable of corporate income tax is estimated to be positive and significant. This result indicates the existence of inertia or regulatory dynamics in the process of tax collection from companies. In other words, part of the current period's tax revenue is affected by trends and structures prevailing in the previous period, which could be due to the continuity of companies' activities, relative stability in the economic structure, or tax recognition and collection procedures. The presence of a positive coefficient for the lagged variable justifies the use of a dynamic model for this sector.

The coefficient of elasticity of the corporate tax base (X_c) is estimated to be 0.33. This coefficient, which expresses the elasticity of tax revenue relative to changes in the tax base (corporate profits), shows that in the short term, for a one percent increase in the corporate tax base, the tax revenues of this sector increase by 0.33 percent. Since this elasticity is less than unity, it can be concluded that the corporate tax system in Iran does not fully follow the growth of its tax base. In other words, when the economy grows and corporate profitability increases, tax revenues increase at a slower rate than the growth of the base. This phenomenon could be due to the existence of extensive exemptions, tax evasion, or inefficiency in the detection and collection system.

The coefficient of the effective corporate tax rate variable is estimated to have a negative sign and an absolute value of -0.16. This result indicates an inverse relationship between an increase in the effective tax rate and revenues from this base. According to this finding, a one percent increase in the effective corporate tax rate (which could be due to an increase in the statutory rate, a decrease in exemptions, or improved collection) leads to a 16 percent decrease in tax revenues in this sector in the short term. This finding is very important and indicates the existence of the Laffer Curve phenomenon in the Iranian economy for corporate taxes. In other words, an increase in the tax rate beyond the optimal level, due to negative effects on production incentives, profitability, and possibly increased tax evasion, not only does not increase revenue, but also leads to a significant decrease. This result is important for tax policymakers, as increasing tax rates is not necessarily a good solution to increase government revenues and its inhibitory effects on economic activities should be considered.

C (5): is the width of the business income tax model, C (6): is the short-term tax revenue in the business income tax, C (7): is the elasticity of the business tax base relative to the business income tax, and C (8): is the average effective tax rate in the business sector.

As in the previous equation, the lagged variable coefficient is positive and significant, indicating time dynamics in this type of tax. The continuity of business activity and tax procedures can justify this finding.

The revenue elasticity of business tax relative to the tax base (X_j) is estimated to be 0.07, which is also lower than that of the corporate sector. This low elasticity (much less than unity) indicates that tax revenues from businesses have very little flexibility with respect to the growth of activities in this sector. For every 1% increase in the business tax base (which could indicate a boom in small and medium-sized businesses), only 0.07% of the sector's tax revenues are added. This could be due to challenges in identifying and collecting taxes from businesses (especially small businesses), tax systems based on ad hoc rather than documentary considerations, or the large informal economy in this sector. The coefficient on the effective tax rate for businesses is also estimated to be negative, at -0.40. This finding suggests that an increase in the effective tax rate for businesses has a more severe downward

impact on the sector's revenues than for the corporate sector. A 1% increase in the effective tax rate for businesses reduces the sector's revenues by 40%. This result, stronger than for the corporate sector, could indicate that the activities of the business sector are very sensitive to increases in tax costs. Given that the sector often faces financial constraints and less access to capital markets, an increase in the tax burden can quickly lead to their exclusion from the tax system (through activity in the informal economy) or a significant reduction in their economic activities. This finding is a warning to policymakers that any increase in the tax burden on this sector could have severe and adverse consequences for government revenues.

C(9): is the width of the origin for the payroll tax model, C(10): is the short-run sectoral tax revenues in the payroll tax, C(11): is the elasticity of the payroll tax base relative to the payroll tax, and C(12): is the average effective tax rate in the payroll sector.

The results of the estimation of the model related to the payroll tax indicate significant differences between this tax base and the previous two bases. The coefficient of the lagged variable is positive, indicating the existence of dynamics in this variable.

The revenue elasticity of the payroll tax relative to the tax base (X_w) is estimated to be 0.56, which is much higher and closer to one compared to the elasticities of the corporate and business sectors. This finding indicates the relatively higher efficiency of the payroll tax system in Iran. For every one percent increase in the payroll tax base (which is mainly due to an increase in wages and formal employment), the revenues of this sector increase by 0.56 percent. The reason for this higher elasticity can be found in the nature of the payroll tax system, which is mainly collected as a deduction from the source (official public and private sector employees) and at progressive rates. This collection method minimizes the possibility of tax evasion and creates a high correlation between the growth of the base and income.

The coefficient of the effective tax rate on payroll is estimated to be negative and equal to -0.08. Although this coefficient is also negative, its absolute value is lower than in the previous two sectors. A 1% increase in the effective tax rate on payroll leads to an 8% decrease in the income of this sector. This negative effect, although severe, is milder than in the corporate and business sectors. This could be due to the more unavoidable nature of the payroll tax (due to withholding) and the lower elasticity of labor supply to changes in the tax rate in the short run. However, this result also suggests that an increase in the payroll tax rate can have negative effects on work incentives and the demand for formal labor.

C (13): The width of the origin for the model of other direct taxes, C (14): Short-term sectoral tax revenues in direct taxes, C (15): Base elasticity of other direct taxes relative to other direct taxes, and C (16): Average effective tax rate in the other direct taxes sector.

The results of the model estimation for other direct taxes show that the coefficient of the lagged variable is positive and significant.

The coefficient of tax base elasticity (X_o) is estimated to be very high and close to unity (0.97). This means that the revenues of this sector almost completely follow the fluctuations of their tax base. For every one percent increase in the base, 0.97 percent is added to the revenues of this sector. This high elasticity can be due to the specific nature of these types of taxes (such as property taxes, inheritance taxes, etc.), which are usually collected based on specific information and registered transactions.

The coefficient of the effective tax rate is negative and significant (-0.46). This coefficient indicates that an increase in the effective tax rate in this sector has a decreasing effect on its revenues (a 46% reduction for every 1% increase in the rate). This phenomenon can be explained by the nature of the bases of these taxes (such as property) which have high elasticity with respect to the tax rate and an increase in the rate can quickly lead to a decrease in transactions, tax evasion, or asset transfers.

C (17): Width from the origin for the domestic transaction tax model, C (18): Short-run sectoral tax revenues in the domestic equations sector, C (19): Elasticity of the domestic transaction tax base with respect to the domestic transaction tax and C(20): Average effective tax rate in the domestic transactions sector.

The results of the model estimation for the domestic transaction tax (including VAT and sales tax) indicate the specific characteristics of this base. The coefficient of the intervening variable is positive, indicating the dynamics of this variable.

The revenue elasticity of this type of tax relative to the base (X_d) is estimated to be greater than unity and equal to 1.21. In other words, a one percent increase in the domestic transaction tax base (consumption expenditure) leads to a 121 percent increase in the revenue of this sector. This elasticity higher than unity can be attributed to the characteristics of this type of tax. In sales tax systems, and especially VAT, due to the broad base, multiple rates, and more efficient collection mechanisms, there is a possibility of a greater correlation between consumption growth and tax revenue growth. This finding indicates that the domestic transaction tax in Iran has a suitable elasticity.

The coefficient of the effective tax rate in this sector is estimated to be negative and equal to -0.22. A one percent increase in the effective tax rate on domestic transactions leads to a 22 percent reduction in revenue in this sector. This result is very important and worth considering. This finding supports the existence of a Laffer curve in this tax base and shows that increasing consumption tax rates (such as VAT) beyond the optimal level can have a severe and adverse effect on government revenues due to negative effects on consumption, price increases, and possibly the spread of tax evasion and smuggling. Policymakers should exercise extreme caution in determining the rates of these types of taxes.

C (21): Width from the origin for the import tax model, C (22): Short-run sectoral tax revenues for the import sector model, C (23): Elasticity of the import tax base relative to the import income tax, and C (24): Average effective tax rate in the import sector.

The results of the model estimation for import tax are positive and significant lagged variable coefficient. The revenue elasticity of this type of tax relative to the import base (X_m) is estimated to be 0.017, which is less than unity. This means that as the volume of imports grows, tax revenues in this sector increase at a slower rate (0.017 percent per 1 percent growth in the base). This relatively low elasticity could be due to the tariff structure, the existence of extensive exemptions for some basic goods and raw materials, or a shift in the import mix towards goods with lower tariff rates. The coefficient of the effective import tax rate is negative and equal to -0.17. This negative coefficient indicates that an increase in tariff rates and other import charges has a small negative impact on the revenues of this sector (a 17 percent decrease per 1 percent increase in the rate). This phenomenon can be explained by the effects of an increase in the tariff rate on a decrease in the volume of imports (due to an increase in the price of imported goods and a decrease in demand for them) as well as an increase in the incentive to smuggle goods. Therefore, increasing import tax rates, like other sectors, if it exceeds the optimal level, will lead to a decrease in government revenues due to a decrease in the base (imports).

Discussion

Interpreting Findings in the Form of Learning Translation

In order to adapt the research to the structure of public policy learning and education spaces, the findings in the table above are categorized as “baseline data in an educational simulation environment.” These analyses show how learners (students and experts) improve their analytical thinking in the field of tax reform by analyzing econometric outputs:

a) Analyzing the tax behavior of companies and businesses (simulating the deterrent effect of the rate)

- Empirical data: The base elasticity coefficient of companies ($C_3=0.33$, $C_{3_3} = 0.33$, $C_3=0.33$) and businesses ($C_7=0.46$, $C_{7_7} = 0.46$, $C_7=0.46$) is much lower than one. Also, the effective tax rate on companies ($C_4=-0.16$, $C_{4_4} = -0.16$, $C_4=-0.16$) and businesses ($C_8=-0.40$, $C_{8_8} = -0.40$, $C_8=-0.40$) is negative and significant.
- Educational implication (for the learner): Learners in the learning environment will realize that in the Iranian economy, increasing the effective tax rate in these two sectors has a

strongly adverse effect on revenues (Laffer curve). The tax system does not fully follow the growth of profitability due to the prevalence of tax evasion or the transfer of activities to the informal sector.

- Designed learning activity: The learner should enter the scenario of a “5% increase in the tax rate on formal businesses” in the simulator and calculate its decreasing effects on government revenues and analyze why educating taxpayers and developing information bases are more effective than simply increasing rates.
- b) Analysis of the difference between payroll taxes and consumption taxes (the impact of smart mechanisms in the learning environment)**
- Empirical data: The elasticity of payroll taxes relative to their base ($C_{11}=0.56C_{\{11\}} = 0.56C_{11}=0.56$) is higher for companies and businesses. The income elasticity of domestic transactions relative to consumption expenditures ($C_{19}=1.21C_{\{19\}} = 1.21C_{19}=1.21$) is greater than unity.
 - Educational implications (for the learner): By comparing these variables, the student will understand that withholding systems (salary) and information-based structures (domestic transaction tax/value added tax) have high efficiency in collection.
 - Designed learning activity: In an online workshop environment, learners examine how the tax burden shifts from production to consumption by modeling the behavior of a value-added tax and documenting its distributional and welfare implications as a policy exercise.

A Framework for Developing Organizational Learning Capacity in Tax Reform

One of the main objectives of this research is to transform the coefficients of the concurrent system into behavioral and educational codes for managers and experts of the Tax Administration. These results indicate that continuous training of employees and taxpayers is necessary around the following two key axes:

1. Moving from a top-down approach to data-driven systems: The very low elasticity of jobs (0.070.070.070 in the short term) is used as educational evidence to show learners that traditional methods of recognition disconnect taxes from economic realities and proves the necessity of designing organizational learning spaces to master tax data mining technologies.
2. Measuring Laffer thresholds in participatory decision-making: The negative coefficients of effective rates in all sectors indicate that employees of the organization need to learn that increasing the tax burden does not necessarily increase revenue efficiency.

By embedding this data in learning management systems (LMS) and tax expert training portals, an efficient platform for "evidence-based decision-making" in the Iranian tax reform process is provided.

The results of the estimation of the dynamic simultaneous equation system show that a large part of the estimated coefficients are statistically significant and play an effective role in explaining the behavior of tax revenues and tax elasticities in the Iranian economy. Positive and significant coefficients (including C_{1C_1C1} , C_{2C_2C2} , C_{3C_3C3} , C_{6C_6C6} , C_{7C_7C7} , C_{9C_9C9} , C_{10C_10C10} , C_{11C_11C11} , C_{13C_13C13} , C_{14C_14C14} , C_{15C_15C15} , C_{18C_18C18} , C_{19C_19C19} , C_{21C_21C21} , C_{22C_22C22} and C_{23C_23C23}) indicate that improving economic variables and structural reforms can increase the revenue-generating capacity of the tax system. In contrast, negative and significant coefficients (such as C_{4C_4C4} , C_{8C_8C8} , C_{16C_16C16} , C_{17C_17C17} , C_{20C_20C20} and C_{24C_24C24}) indicate the existence of the Laffer curve phenomenon in most Iranian tax bases and indicate that policies based on increasing rates without considering the elasticity of taxpayer behavior have a decreasing effect on tax revenue performance.

From the perspective of developing learning spaces and policy education, this contrast between positive and negative coefficients reveals a “cognitive gap” in the minds of policymakers and students that traditional and passive education cannot solve. In the following, these

findings are analyzed in contrast to the world's empirical literature and within the framework of educational contexts.

Quality of Tax Administration and Organizational Learning (alignment with Cornevin et al., 2023)

The findings of this study on the dynamic impact of structural reforms on increasing tax elasticities are consistent with those of Cornevin, Corrales, and Angel (2023). They showed, using data from 185 countries, that tax elasticities are strongly influenced by the quality of tax administration and that systematic improvements in tax revenues occur when structural reforms are accompanied by ongoing management training.

In the context of organizational learning spaces, this alignment suggests that the simultaneous equations econometric model used in this study can serve as an “instructional simulator” in in-service courses of the tax administration. Using this model, experts learn how regulatory dynamics (represented in the model with positive lagged variables) affect the speed of transmission of the effect of new policies and why static estimates lead to bias in real decision-making.

Digitalization and data-driven learning (alignment with Adan et al., 2023)

Our findings are also consistent with Adan et al.'s (2023) study. They showed that tax revenue improvements are driven more by digitalization of processes, strengthening of information systems, and increased taxpayer compliance through educational channels than by increases in statutory rates. In the present model, the significant negative coefficients of effective rates (especially in the business sector with coefficient $C8 = -0.40$) indicate that tax pressures without data support stimulate defensive behaviors of taxpayers (such as tax evasion and sheltering in the informal economy).

This highlights the need to design “Interactive Learning Environments for Taxpayers”. Instead of focusing on penalty-based approaches, the tax authority can create digital learning platforms where complex tax laws are presented in the form of simple educational modules, self-declaration simulators, and gamified tax compliance games to improve tax revenue elasticity by improving the tax literacy of the community.

Reforming tax bases in university curricula (alignment with Crispolti & Sheng, 2022)

The findings of this study are comparable to those of Crispolti and Sheng (2022), who found that broadening tax bases and eliminating exemptions has a much more sustainable effect than increasing rates. In our study, the high elasticity of the tax on domestic transactions ($C19 = 1.21$) compared to the very low elasticity of jobs ($C7 = 0.07$) confirms this proposition in the Iranian economy.

This finding highlights the importance of updating curricula in graduate economics and policy. Universities should encourage students to work with real data on Iran's tax elasticities rather than abstract analyses by redesigning their teaching spaces and creating “Policy Data Labs.” Teaching these findings in a case study format will help students understand why the consumption base reform (domestic transactions) creates more sustainability than the micro-business sector.

Data-driven governance and modeling in higher education (alignment with OECD, 2024)

Finally, the results are consistent with the OECD report (OECD, 2024) that emphasizes the role of emerging technologies, machine learning, and data analytics in identifying tax evasion risks. The negative coefficients of some of our model variables indicate that without modern data management tools and taxpayer behavior analysis, a significant portion of potential revenues is lost.

This highlights the need for a link between the field of Educational Technology and the general economy. To achieve the goals of data-driven governance, tax organizations and universities should create joint learning spaces (such as tax clinics and fiscal policy simulation centers) to predict and educate taxpayer behavior patterns and tax evasion through big data analytics and machine learning.

Educational Conclusion and Policy Implications for Learning Spaces

The present study showed that tax elasticity in the Iranian economy is not simply a function of macroeconomic variables, but is strongly dependent on the quality of organizational learning, the efficiency of tax management, and the extent of use of modern educational and administrative tools.

Accordingly, the main contribution of this research in the field of education and learning studies can be summarized in three points:

1. Design of data-based training modules: It is proposed that the coefficients and simultaneous equations estimated in this article be developed in the form of a tax policy simulator training software and taught as a teaching aid tool in universities.
2. Development of organizational learning spaces: The Tax Administration should change its training programs from the form of traditional law training to workshops on elasticity analysis, dynamic revenue forecasting, and evidence-based risk management.

The theme of public education of taxpayers in smart platforms: The use of digital educational technologies to create transparency and reduce taxpayer compliance costs is the key to improving the elasticity of tax bases in the long term.

Conclusion

The present study aimed to analyze tax elasticities in the Iranian economy with the approach of developing organizational learning capacities and promoting the evidence-based decision-making system. For this purpose, the dynamic simultaneous equations system was used as a structured framework to estimate and analyze tax elasticities in different income bases. The empirical results from the model estimation showed that a large part of the estimated coefficients are statistically significant, which confirms the existence of stable and structural relationships between macroeconomic variables, tax bases, and government revenues. The research findings show that tax elasticities in the Iranian economy are not simply a function of the dynamics of economic growth, but are also strongly influenced by the structure of tax management, the quality of governance, and the level of knowledge and organizational learning of agents. The presence of positive and significant coefficients in a large part of the model equations indicates the high capacity of institutional reforms and the development of information technologies in the sustainability of government revenues. In contrast, negative coefficients related to effective tax rates (especially in the business and corporate sectors) confirm the existence of the Laffer curve phenomenon and indicate that policies focused on increasing statutory rates without expanding the information base lead to increased tax evasion, the expansion of the informal sector, and a decrease in potential revenues.

From the perspective of policymaking and organizational learning, the results of this study show that dynamic analysis of tax elasticity is a key tool for the transition from traditional decision-making to evidence-based policymaking. Interpreting the model coefficients and simulating its various scenarios can be used as an active learning framework for policymakers and financial analysts to design more efficient processes by understanding the transmission mechanisms and behavioral feedbacks of taxpayers. Improving this analytical capability in the Tax Administration and academic centers' expert body will be a fundamental step towards improving the process of structural reforms in the country's tax system.

In summary, the success of tax system reforms in Iran depends more on improving the specialized knowledge of decision-makers, improving the quality of tax governance, developing smart information systems, and improving taxpayers' tax culture and literacy than on increasing tax rates. Applying the results of this research can provide the necessary basis for designing effective tax policies, reducing forecast deviations in annual budgets, and ultimately reducing the country's economy's dependence on oil revenues.

Practical and policy suggestions

1. Design and implementation of an intelligent tax elasticity monitoring system:

It is proposed that the Tax Administration of Iran, by designing a centralized analytical system, calculates the elasticity of various tax bases dynamically and periodically so that policymakers can simulate the behavioral effects of taxpayers and the elasticity of collection before implementing any changes in the laws.

2. Developing skills-based training programs and evidence-based decision-making:

Conducting specialized training courses and problem-based workshops in the fields of applied econometrics, big tax data analysis, and taxpayer behavior modeling for experts and decision-makers of the Tax Administration and the Planning and Budget Organization is necessary to improve the country's expert body.

3. Promoting intelligence and connectivity of data systems:

In order to reduce tax evasion and improve the elasticity of weak bases (such as business taxes), it is recommended to accelerate the connection of banking systems, financial transactions, and the flow of goods to the tax system, and to use artificial intelligence and data mining tools to automatically identify compliance risks.

4. Prioritizing the expansion of tax bases and reviewing exemptions:

Given the high elasticity of consumption tax and its positive dynamics, it is recommended that policymakers, instead of increasing tax rates on formal production sectors, focus on eliminating unnecessary exemptions, defining new bases (such as taxes on total income and capital gains), and reducing the size of the underground economy.

5. Institutionalizing elasticity estimates in budget document preparation:

It is suggested that the Ministry of Economic Affairs and Finance and the Planning and Budget Organization include the tax elasticity index estimated in this study as one of the main criteria for realistic forecasting of tax revenues in the country's annual budget bills.

Future research may focus on the practical development of digital platforms, interactive dashboards, and simulation-based tools for implementing the proposed tax learning environment. Although advanced technologies such as educational games and intelligent simulation systems provide promising opportunities, their development requires further studies regarding technological requirements, instructional design principles, and user evaluation. Therefore, these applications are considered future extensions rather than immediate outcomes of the current framework.

A limitation of this study is that the proposed learning environment has not yet been experimentally implemented or evaluated among learners. Future research should conduct empirical assessments involving students, tax professionals, and policymakers to examine learning outcomes and practical effectiveness.

From an educational perspective, the findings suggest that professional tax training should move beyond traditional rule-based instruction toward interactive environments based on data analysis, simulations, and policy scenarios.

Declaration of Competing Interest

The author declares that he has no competing financial interests or known personal relationships that would influence the report presented in this article.

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