

Development of a Decision Support System (DSS) for Supply and Inventory Management: A Case Study of the Cement Industry

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Abstract: The objective of this study was to develop a Decision Support System (DSS) for supply and inventory management in the cement industry. The purpose was to provide a mechanism for enhancing decision-making capabilities in addressing supply management and inventory-related problems within the cement industry. This research is classified as an applied study, and accordingly, a field research strategy was adopted. The research methodology is mixed-methods. More specifically, in terms of the logic of data collection, the research approach is inductive-deductive because it examines a phenomenon for which no comprehensive theory exists at the industrial-market level or for which no general consensus has yet been reached. The inductive component involved initially identifying the dimensions and components associated with the characteristics of a Decision Support System (DSS) for supply and inventory management by drawing on previous topics and studies through a literature review. Subsequently, the identified criteria were refined using a critical appraisal method so that substantial theoretical coherence could be achieved through analysis using a hybrid Artificial Neural Network–Genetic Algorithm (ANN-GA) model. In this study, an artificial neural network (ANN), specifically a Multilayer Perceptron Artificial Neural Network (MLP-ANN), was implemented using a backpropagation (BP) learning algorithm. Based on the R^2 measure, linear regression and MLP regression outperformed the Random Forest algorithm. Although their performance became increasingly similar as the volume of training data increased, scaled MLP regression ultimately outperformed the competing models, achieving a maximum R^2 value of 0.98. The application of ANN provides an effective means of dealing with nonlinear relationships within datasets or models because of its capabilities in prediction and data fitting. The proposed system can continuously collect and analyze data and assist managers in making better decisions regarding resource procurement and inventory management. Consequently, developing a decision support system based on advanced technologies can steer the cement industry toward greater efficiency, lower costs, and improved production and resource procurement processes. Such innovations can enhance the competitiveness of the cement industry and improve its position in the market.

Keywords: decision support system, resource and inventory management, cement industry

1. Introduction

Taxation constitutes one of the most important and sustainable sources of public revenue and plays a central role in financing public services, redistributing income, stabilizing the economy, and supporting long-term development. The effectiveness of a tax system, however, depends not only on the design of tax laws and the

determination of tax liabilities but also on the ability of the tax administration to assess, collect, enforce, and resolve disputes efficiently. In this context, tax arrears represent a particularly important challenge because they indicate a gap between assessed tax liabilities and amounts actually collected within the legally prescribed period. Persistent tax arrears can weaken government cash flows, increase administrative costs, reduce the predictability of public revenues, and undermine perceptions of equity among compliant taxpayers. In developing and emerging economies, where governments may face stronger fiscal constraints and greater dependence on domestic revenue mobilization, the effective management of tax arrears is especially important. Previous Iranian research has identified multiple institutional, administrative, financial, and taxpayer-related causes of tax arrears, emphasizing that overdue tax liabilities are not simply the outcome of taxpayers' unwillingness to pay but can also arise from weaknesses in assessment, enforcement, communication, dispute resolution, and administrative procedures [1, 2].

The importance of effective taxation extends beyond the immediate objective of revenue collection. Tax policy and tax administration influence private investment, corporate behavior, innovation, financing decisions, and broader patterns of economic activity. Evidence from Iran has shown that fiscal discipline and the structure of corporate taxation can affect private investment, highlighting the importance of designing tax policies that achieve revenue objectives without generating unnecessary distortions [3]. International evidence similarly demonstrates that taxation is closely related to corporate financing and strategic behavior. Access to finance can affect firms' incentives and opportunities to engage in tax avoidance, suggesting that tax compliance and tax risk must be interpreted within a broader financial and institutional environment [4]. Tax incentives also interact with investment in research and development and innovative activity, meaning that the tax system can function both as a revenue-collection mechanism and as an instrument of economic policy [5]. Therefore, weaknesses in tax administration, including prolonged disputes and accumulation of arrears, can have consequences that extend beyond revenue loss to influence investment decisions, business planning, and economic efficiency.

Tax risk has consequently become an important concept in modern tax administration. Tax risk may encompass the probability of noncompliance, underreporting, avoidance, evasion, delayed payment, disputed assessments, unsuccessful enforcement, and accumulation of unpaid liabilities. In Iran, efforts have been made to develop models for measuring tax risk and to evaluate its implications for firms and the capital market, indicating the growing recognition that tax exposure should be assessed systematically rather than treated only as a retrospective enforcement problem [6]. Risk-based approaches have also been proposed for tax auditing, particularly for small and medium-sized enterprises, because tax administrations face limited resources and cannot subject every taxpayer to the same level of scrutiny [7]. A risk-based perspective allows tax authorities to identify cases with a higher probability of noncompliance or nonpayment and to allocate auditing, collection, and adjudication resources more effectively. Such an approach is particularly relevant to tax arrears because the risk of delayed or unsuccessful collection may develop throughout the tax administration process, including during objection, appeal, adjudication, and enforcement.

Tax avoidance and tax evasion represent additional dimensions of the broader tax-risk environment. Corporate taxpayers may use accounting, financial, organizational, or legal mechanisms to reduce taxable income or postpone tax payments. Earlier Iranian studies have examined the relationship between tax avoidance and auditor characteristics, including industry specialization, as well as the relationship between tax avoidance policies and auditors' reporting decisions [8, 9]. These findings highlight the role of professional oversight and information quality in identifying tax-related risks. More recent international research has demonstrated that corporate tax avoidance can be influenced by disclosure requirements, financing conditions, innovation incentives, and

organizational structures. Mandatory corporate social responsibility disclosure, for instance, has been shown to produce real effects on corporate tax avoidance, illustrating how transparency requirements can alter firms' tax behavior [10]. Country-by-country reporting has likewise been examined as a mechanism for constraining multinational tax avoidance and income manipulation, particularly where corporations can restructure supply chains or allocate income strategically across jurisdictions [11]. These developments reinforce the importance of transparency, information quality, documentation, and institutional monitoring in controlling tax risk.

Recent evidence further indicates that firms' tax behavior is embedded in broader regulatory and strategic incentives. Innovation-related incentives may unintentionally affect corporate tax avoidance because firms respond simultaneously to tax benefits, reporting requirements, and financing constraints [12]. Likewise, reductions in tax avoidance can influence corporate social responsibility behavior, suggesting that tax compliance and corporate nonfinancial strategies may be interconnected [13]. Other evidence shows that taxation, sustainability disclosure, and economic growth interact in ways that are relevant to sustainable development and fiscal governance [14]. These findings suggest that a tax administration must balance enforcement, transparency, economic incentives, and administrative fairness. When tax disputes are handled slowly or inconsistently, these balances may be disrupted because uncertainty over final tax liabilities can persist for long periods, potentially delaying collection and increasing the probability that assessed liabilities become arrears.

Tax arrears may also arise strategically when legal and administrative procedures allow taxpayers to defer payment for extended periods. Theoretical research has shown that tax deferment may create incentives for sham litigation where taxpayers benefit from postponing payment while using alternative sources of credit [15]. This perspective is highly relevant to tax adjudication because it demonstrates that dispute resolution is not merely a legal function aimed at determining the correct tax liability; it can also influence the timing of government revenue and taxpayers' economic incentives. If objection and adjudication procedures are excessively lengthy, unpredictable, or susceptible to repeated procedural delays, taxpayers may perceive litigation as a mechanism for postponing payment. Conversely, if adjudication is rapid, technically competent, impartial, transparent, and supported by effective pre-adjudication mechanisms, unnecessary disputes may be reduced and legitimate disputes may be resolved before tax liabilities evolve into long-term arrears.

Tax adjudication therefore occupies a critical position between tax assessment and final collection. It provides taxpayers with an institutional mechanism through which they can challenge assessments, present evidence, obtain review, and seek correction of administrative errors. At the same time, tax adjudication protects the legitimacy of the tax system by ensuring that enforcement is subject to procedural safeguards. Modern tax systems increasingly recognize that tax dispute resolution should promote both administrative efficiency and taxpayer rights. Comparative research on quasi-judicial tax adjudication authorities in France, England, and Germany has emphasized the relevance of modern dispute-resolution mechanisms, institutional specialization, and procedural arrangements for improving the quality of tax adjudication [16]. In Iran, assessments of the existing and desired conditions of tax adjudication authorities have similarly identified the need to improve institutional structures and procedures within the national tax administration [17]. These concerns are particularly important when tax adjudication is evaluated not only in terms of legal correctness but also in terms of its contribution to timely revenue collection and the reduction of tax-arrears risk.

Procedural justice is one of the fundamental requirements of a credible tax adjudication system. Taxpayers are more likely to perceive tax decisions as legitimate when they have access to transparent procedures, impartial decision-makers, clear rules, opportunities to present evidence, and reasoned decisions. Recent analysis of the

Iranian tax adjudication system with reference to the European Code of Good Administrative Behaviour has highlighted the importance of principles associated with good administration, including legality, impartiality, transparency, responsiveness, and procedural fairness [18]. These principles are not only normative requirements. They may also have practical implications for tax compliance and arrears because taxpayers who perceive decisions as arbitrary or inadequately reasoned may be more inclined to challenge assessments, prolong disputes, or resist payment. Accordingly, procedural justice and impartiality should be viewed as components of effective risk management rather than as considerations separate from revenue administration.

The characteristics and professional competence of adjudicators may also influence dispute outcomes. Evidence from the United States Tax Court indicates that judicial attributes can affect the resolution of corporate tax disputes, demonstrating that adjudication outcomes may depend partly on institutional and decision-maker characteristics rather than exclusively on the objective features of a case [19]. Similarly, research on administrative litigation involving estate and gift taxes has shown that representation by professional tax agents can affect litigation outcomes, emphasizing the importance of expertise in complex tax disputes [20]. These findings support the proposition that technical knowledge, professional experience, specialized training, and the quality of legal and economic reasoning are important elements of tax adjudication. In complicated cases, inadequate expertise can result in errors, inconsistent decisions, repeated appeals, and delayed finalization of tax liabilities, all of which may increase the risk of arrears.

The efficiency of tax adjudication depends not only on adjudicators themselves but also on the design of the surrounding administrative system. Delays in tax dispute resolution may arise from unclear laws, fragmented responsibilities, incomplete documentation, repeated referral of cases, inefficient communication, and insufficient coordination among taxpayers, auditors, and adjudication authorities. Iranian research has explicitly examined strategies for reducing delays in tax adjudication, underscoring the importance of procedural reform in accelerating the resolution of disputes [21]. Delays are especially problematic from a tax-arrears perspective because the longer a liability remains disputed, the greater the possibility of changes in taxpayers' financial circumstances, deterioration of collectible assets, loss of documentation, administrative costs, or strategic postponement. Thus, speed and timeliness should not be pursued at the expense of accuracy and fairness; rather, the objective should be a balanced adjudication system capable of delivering prompt, evidence-based, legally defensible decisions.

Transparency and consistency in tax legislation are equally important. Complex, ambiguous, frequently changing, or inconsistently interpreted tax rules can increase the probability of disagreement between taxpayers and tax authorities. Such disagreement may generate a larger volume of objections and appeals, increase administrative workload, and prolong collection. Research on tax evasion in Iranian free trade-economic zones has identified multiple factors contributing to noncompliant behavior, indicating that tax evasion is shaped by institutional and regulatory conditions as well as taxpayer incentives [22]. A transparent legal framework can reduce interpretive uncertainty, while consistent application can strengthen perceptions of predictability and fairness. Moreover, clear communication with taxpayers can prevent disputes before they reach formal adjudication by improving understanding of tax obligations, evidence requirements, procedural rights, and deadlines.

The growing digitalization of public administration creates additional opportunities for improving tax adjudication. Digital case-management systems can support electronic filing, standardized documentation, automated notifications, case tracking, data integration, and risk-based prioritization. They can also provide managers with timely information about case duration, bottlenecks, recurring grounds for appeal, and the

performance of adjudication units. Although technological reform does not automatically improve governance, it can strengthen the information infrastructure required for transparent and efficient decision-making. Broader research demonstrates that fiscal and governmental conditions can influence firms' strategic responses, including innovation-related behavior [23]. In the tax context, digitalization can similarly alter the interactions among authorities and taxpayers by reducing information asymmetries, improving traceability, and enabling more systematic monitoring of disputed liabilities. These capabilities may be particularly valuable for identifying tax cases at high risk of becoming long-term arrears.

The relationship between tax adjudication and arrears has already received direct attention in Iranian scholarship. A tax-arrears risk model developed with a tax adjudication approach indicates that adjudication-related factors can be integrated into a systematic framework for understanding and managing overdue tax liabilities [24]. Likewise, dynamic modeling of corporate income tax arrears has demonstrated that collection outcomes evolve over time and are influenced by interactions among multiple administrative and economic variables [2]. These studies suggest that arrears should not be treated as a static stock of unpaid debt. Instead, they represent the cumulative outcome of decisions and delays occurring throughout assessment, objection, adjudication, collection, and enforcement. Therefore, effective intervention requires identifying the factors within the adjudication process that can prevent disputed liabilities from becoming persistent arrears.

Nevertheless, a comprehensive model of effective tax adjudication should extend beyond isolated procedural or legal variables. It should integrate specialized training and professional knowledge, taxpayer awareness, professional ethics and administrative integrity, performance evaluation, localization of adjudication models, expertise of panel members, effective communication, digitalization, pre-adjudication dispute resolution, speed and accuracy of proceedings, legal transparency, procedural justice, arrears-risk management, internal and external oversight, interinstitutional coordination, the institutional effectiveness of dispute-resolution panels, quality of decision-making, documentation quality, and the expected consequences of implementing an improved model. Such a multidimensional perspective is consistent with contemporary understandings of tax administration as an integrated governance system in which compliance, enforcement, transparency, taxpayer rights, organizational capability, and revenue outcomes are interdependent. The importance of institutional integration becomes even clearer in light of evidence that corporate tax behavior responds to multiple external constraints and incentives rather than to tax rates alone [4, 11, 12].

Furthermore, improvements in tax adjudication may contribute to broader fiscal and developmental objectives. Efficient dispute resolution can enhance the predictability of tax revenue, reduce administrative costs, strengthen voluntary compliance, and improve taxpayer confidence in public institutions. At the macroeconomic level, a more predictable tax system can support investment and reduce uncertainty, while improved revenue mobilization can strengthen government capacity to finance development priorities. These considerations align with evidence linking taxation to economic growth, sustainability, investment, and innovation [3, 5, 14]. At the corporate level, stronger transparency and reduced opportunities for avoidance can also alter firms' reporting, financing, and social responsibility strategies [10, 13]. Consequently, improving tax adjudication should be understood as part of a broader agenda of fiscal governance rather than merely as an administrative reform within tax dispute centers.

Despite the growing literature on tax avoidance, tax evasion, tax risk, tax audits, tax arrears, and adjudication, important gaps remain. Existing studies have often examined individual dimensions separately, such as the causes of arrears [1], risk-based auditing [7], tax risk measurement [6], adjudication delays [21], comparative dispute-resolution systems [16], or the institutional condition of Iranian tax adjudication authorities [17]. International

research has also provided important insights into adjudicator characteristics, professional representation, corporate avoidance, litigation incentives, and disclosure mechanisms [15, 19, 20]. However, fewer studies have simultaneously evaluated a broad set of institutional, professional, procedural, technological, ethical, and risk-management factors within one empirical model specifically designed to reduce the risk of tax arrears through improved tax adjudication.

Accordingly, there is a need for an integrated empirical framework capable of determining which dimensions of tax adjudication have statistically meaningful relationships with an appropriate adjudication model and which dimensions may require reconsideration or institutional redesign. Such an approach can provide evidence for policymakers and tax administrators seeking to prioritize reforms, allocate resources, strengthen the professional capacity of adjudication panels, improve taxpayer communication, establish effective oversight, expand digital case management, and develop mechanisms for resolving disputes before they become prolonged formal cases. It can also contribute to the development of a more coherent relationship between adjudication policy and tax-arrears risk management, thereby connecting procedural reform directly to revenue outcomes.

Therefore, the aim of the present study was to investigate the factors affecting tax adjudication in order to develop an appropriate tax adjudication model for reducing the risk of tax arrears in adjudication centers.

2. Methodology

Since any research study can be analyzed from three perspectives—outcome, purpose, and type of data—and different combinations can therefore be conceptualized in terms of these dimensions, the present study is classified as developmental research in terms of its outcome. This is because, through the identification and development of a Decision Support System (DSS) for resource procurement and inventory management, it seeks to establish a more coherent body of applied and theoretical knowledge in this area. In terms of its purpose, this study is classified as applied research, and accordingly, its research strategy is field-based. The methodology of the study is mixed-methods. More specifically, in terms of the logic underlying data collection, the research approach is inductive-deductive because it examines a phenomenon for which no comprehensive theory exists at the industrial-market level or for which there is no general consensus. The inductive component refers to the initial identification of the dimensions and components associated with the characteristics of a DSS for resource procurement and inventory management through the extraction and synthesis of concepts from previous studies and the literature. Subsequently, the identified criteria were refined through critical appraisal so that substantial theoretical coherence could be achieved through analysis using a hybrid Artificial Neural Network–Genetic Algorithm (ANN-GA) model.

Table 1. Parameters of the Proposed Model

Parameter	Symbol
Optimal order quantity of raw material i	q_i^{opt}
Optimal reorder quantity of material i	q_i^{rop}
Safety stock of raw material i	q_i^{ss}
Unit cost of raw material i from supplier j	c_{ij}
Mean consumption rate of raw material i per period	U_i^R
Standard deviation of the consumption rate of raw material i	σ_i^{ll}
Available quantity of raw material i	h_i
Actual lead time of raw material i	T_i^{LT}
Mean lead time of raw material i	$\bar{T}_i^{LT}$
Standard deviation of the lead time of raw material i	σ_i^{LT}

Ordering interval (time between orders) for raw material i	T_i^B
Total cost of raw material i purchased from supplier j	C_{ij}^R
Total cost of all raw materials purchased from all suppliers	C^{Rtotal}
Desired service level for raw material i	θ_i
Standard z-score corresponding to the desired service level for raw material i	z_i
Minimum order quantity required to obtain a discount on raw material i from supplier j	q_{ij}^{min}
Availability of raw material i from supplier j	a_{ij}
Production capacity for raw material i at supplier j	k_{ij}
Discount percentage for raw material i offered by supplier j	δ_{ij}
Number of free units per order of material i from supplier j	f_{ij}
Total supplied quantity of raw material i from supplier j	Q_{ij}^{tsv}
Total quantity of raw material i received from all suppliers	$Q_i^{receive}$

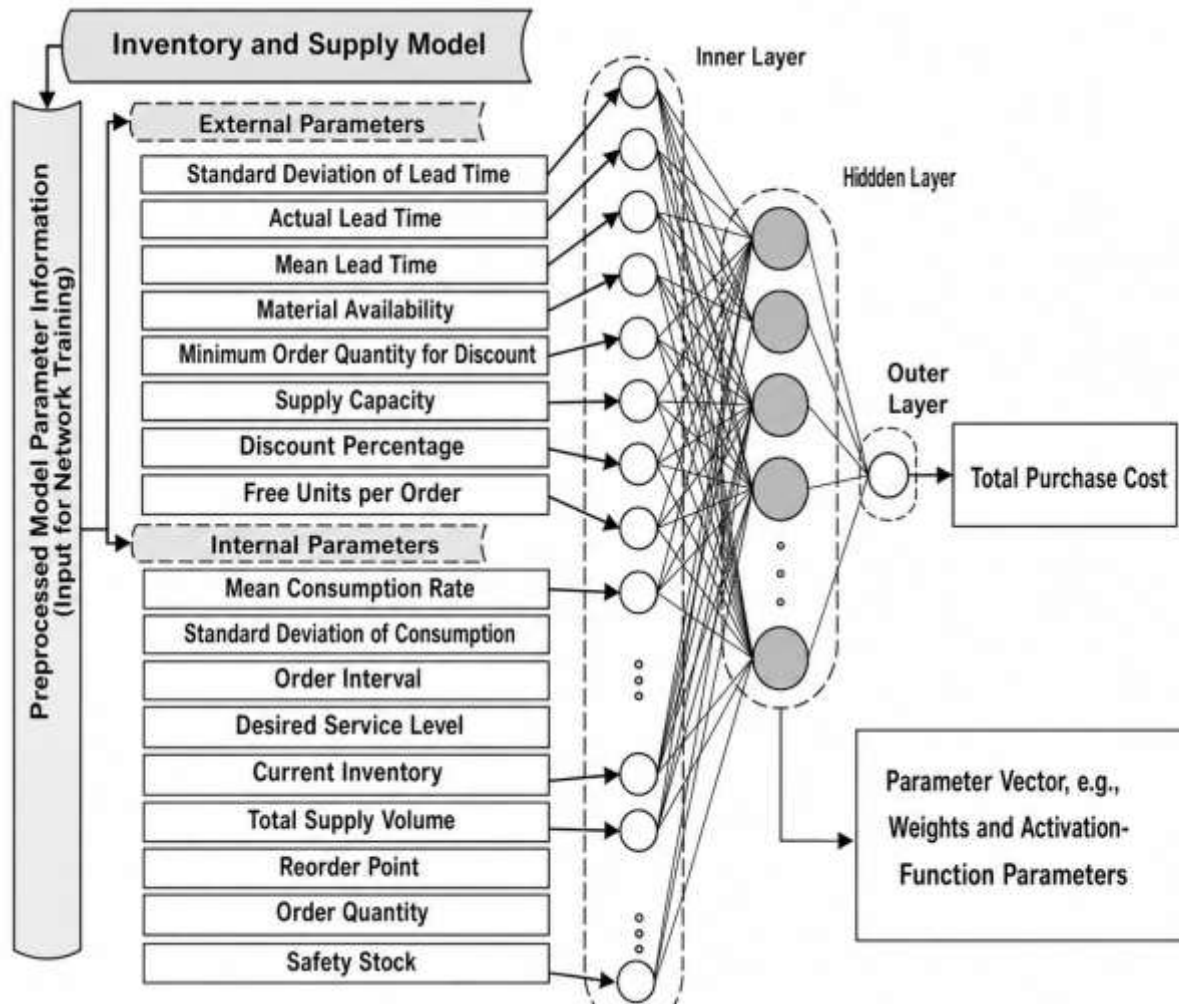


Figure 1. Proposed DSS Model for Inventory Management

In this study, two types of information were considered as the fundamental inputs on which the analysis focused: intuitive information, including routine daily information and daily records of interactions, and measured information, including information derived from the experience and knowledge of skilled workers. To integrate a large volume of information, a mathematical model encompassing variations in all parameters was employed. Accordingly, brute-force algorithms were used to search across all possible parameter values. Since the information could be filtered or transformed before being used for machine learning (ML) training, preprocessing algorithms

from the Scikit-learn library in Python were applied. Standard numerical scaling was used for data standardization and, following evaluation, for dimensionality reduction. The processed parameters obtained at this stage represented potential configurations of inventory and resource management operations. The stopping criterion for the brute-force procedure was set at 120,000 executions. After configuring the data synthesis process, the ANN training data were prepared by eliminating infeasible configurations and applying normalization.

After preparation of the training dataset, the next stage involved constructing the ANN using different configurations to model the complex relationships between the inputs—for example, raw materials, suppliers, utilization rates, and safety stock—and the outputs, including reorder points, supplier selection, and optimal order quantities. This learning process was implemented through intelligent methods to adapt supply and management processes to the constraints and requirements associated with raw materials and suppliers. Accordingly, the ANN was intended to represent the actual behavior of the system. In this study, an ANN, specifically an MLP-ANN, was implemented using a backpropagation (BP) learning algorithm.

3. Findings and Results

Because of the complexity inherent in resource procurement and warehouse inventory management, differences exist between real-world and mathematical models. The following assumptions were established for inventory and supply management using the FOI strategy for multiple materials.

A sufficiently large capacity was assumed for each supplier to prevent raw-material shortages.

The following parameters were treated as constant values within each individual event: unit cost of raw materials, supplier capacity, actual lead time, available raw-material inventory, discount percentage, ordering interval, and the number of free units per order. These values can be manually modified by the decision-maker.

The maximum ordering interval for raw materials was limited to 10 days to prevent overstocking and maintain efficient warehouse operations.

Objective functions

Minimization of the total material purchasing cost:

$$\text{Minimize } C^{Rtotal} (1)$$

Using the following formulation:

The total cost of all raw materials purchased from all suppliers is:

$$C^{Rtotal} = \sum_{i=1}^m \sum_{j=1}^n C_{ij}^R (2)$$

The total cost of all units of raw material i purchased from all suppliers j is:

$$C_{ij}^R = \sum_{i=1}^n \sum_{j=1}^k x_{ij} a_{ij} c_{ij} (1 - \delta_{ij}), \forall a_{ij} > 0 \quad (3)$$

The discount percentage applied to raw materials purchased from the supplier varies within the specified range:

$$0 \leq \delta_{ij} \leq 0.20, \forall i \forall j \quad (4)$$

Supply constraint: The total quantity supplied by all suppliers must not exceed the optimal order quantity.

[Equation not visible in the supplied source]

Desired service level: The service level for raw material i is specified by the decision-makers, with permissible constant values ranging from 0 to 1.

$$0 \leq SL_i \leq 1$$

Safety stock of raw material i: The safety stock level is determined according to the consumption rate, its standard deviation, the standard deviation of order lead time, and the desired service level for the raw material.

$$\sum_{i=1}^m \sum_{j=1}^n a_{ij} Q_{ij}^{tsv} \geq q_i^{op}, \forall a_{ij} > 0 \quad (5)$$

In this equation, z represents the z-score required to achieve the desired service level for raw material i .

Reorder point for raw material i: The reorder point is determined based on the consumption rate, mean lead time, and optimal inventory level.

$$\theta_i = \frac{Q_i^{receive}}{q_i^{opt}} \quad (6)$$

Optimal order quantity of raw material i: The order quantity depends on the quantity of raw material required during the ordering period, the service level, and the current available quantity of the raw material.

$$q_i^{ss} = z_i \sqrt{((\sigma_i^{LT})^2 T_i^{LT}) + (U_i^R)^2 (U_i^R)^2}, \forall i \quad (7)$$

Total supplied quantity: This parameter depends on the total quantity of raw materials received from all suppliers, including the number of free units supplied.

$$\left(x_{ij} + \left(f_{ij} \left(\frac{x_{ij}}{q_{ij}^{min}} \right) \right) \right) a_{ij}, \forall i \forall j \quad (10)$$

where:

The number of free units per order of raw material i purchased from supplier j ranges from 0 to 50 units.

$$0 \leq f_{ij} \leq 50, \forall i \forall j$$

The minimum order quantity required to obtain a discount on raw material i from supplier j ranges from 100 to 1,000 units per order.

$$100 \leq q_{ij}^{min} \leq 1000, \forall i \forall j$$

Supplier capacity: Supplier capacity refers to the quantity of available raw materials that are ready to be ordered.

$$x_{ij} \leq a_{ij} k_{ij}, \forall a_{ij} > 0 \quad (11)$$

Availability of raw material i from supplier j:

$$x_{ij} = 0, \forall a_{ij} = 0 \quad (12)$$

Minimum order quantity: This is the minimum quantity that must be ordered from each supplier to qualify for a discount.

$$x_{ij} \geq q_{ij}^{min}, \forall i \forall j \quad (13)$$

Total quantity of raw materials received from all suppliers:

$$Q_i^{receive} = \sum_{j=1}^k \sum_{k=i}^i Q_{jk}^{tsv}, \forall j \quad (14)$$

Non-negativity of parameter values: All dependent parameters must have non-negative values.

$$x_{ij}, Q_{ij}^{receive}, Q_{ij}^{tsv} \geq 0 \quad (15)$$

Various ANN configurations can be defined in terms of the number of hidden neural layers and parameter vectors—for example, weights and activation-function parameters—which influence the learning and predictive performance of the ANN. Therefore, this study employed a grid-search algorithm in Python to determine the optimal ANN configuration for different training datasets. To train the ANN, the ready-to-use MLPRegressor

implementation provided by the Scikit-learn package in Python was incorporated into the grid-search algorithm to identify the optimal configuration.

The initial ANN configuration was specified as follows:

```
model_mlp = MLPRegressor(
    activation=["tanh", "relu"],
    hidden_layer_sizes=[50, 150, (100, 100)],
    learning_rate=["adaptive", "constant"],
    max_iter=[50, 100, 150, 200]
)
```

After training, ANN performance was evaluated using the following indices: Mean Squared Error (MSE), Mean Absolute Error (MAE), and the coefficient of determination (R^2). The trained ANN demonstrating the best relative performance was characterized by the identified weights and parameter vectors, which were subsequently incorporated as part of the Genetic Algorithm (GA) fitness function.

Table 2 .MSE Values for All Algorithms

Training Size	Linear Regression, Unscaled	Linear Regression, Scaled	MLP Regression, Unscaled	MLP Regression, Scaled	Random Forest, Unscaled	Random Forest, Scaled
500	8.95×10^3	2.94×10^{-2}	4.88×10^6	3.15×10^{-4}	6.18×10^8	1.88×10^{-3}
1,000	7.68×10^3	2.10×10^{-2}	5.57×10^7	2.57×10^{-4}	6.57×10^8	2.26×10^{-3}
5,000	7.44×10^3	2.40×10^{-2}	7.10×10^6	3.40×10^{-4}	6.40×10^8	1.33×10^{-3}
7,500	7.10×10^3	2.13×10^{-2}	4.65×10^6	5.88×10^{-4}	6.23×10^8	2.50×10^{-3}
10,000	6.96×10^3	2.25×10^{-2}	3.47×10^6	6.20×10^{-4}	7.09×10^8	1.49×10^{-3}
25,000	6.40×10^3	2.20×10^{-2}	2.14×10^6	5.32×10^{-4}	6.88×10^8	2.04×10^{-3}
50,000	7.13×10^3	2.19×10^{-2}	2.10×10^6	4.19×10^{-4}	7.20×10^8	1.19×10^{-3}

The next step involved sensitivity analysis of the parameters with respect to the retrieved values. The observations concerned the solution-retrieval procedures performed using GA and ML3. Each experiment demonstrates the effects of the model parameter configuration, that is, the differences between the retrieved solutions and the target values.

Table 3. MAE Values for All Algorithms

Training Size	Linear Regression, Unscaled	Linear Regression, Scaled	MLP Regression, Unscaled	MLP Regression, Scaled	Random Forest, Unscaled	Random Forest, Scaled
500	7.70×10^4	3.25×10^{-1}	3.25×10^5	2.46×10^{-7}	6.20×10^6	2.76×10^{-4}
1,000	7.16×10^4	2.48×10^{-1}	5.57×10^5	3.58×10^{-7}	5.25×10^6	1.59×10^{-4}
5,000	6.32×10^4	3.50×10^{-1}	7.10×10^5	2.33×10^{-7}	5.58×10^6	2.46×10^{-4}
7,500	6.18×10^4	2.47×10^{-1}	4.65×10^5	2.48×10^{-7}	5.77×10^6	1.87×10^{-4}
10,000	7.48×10^4	3.49×10^{-1}	3.47×10^5	2.96×10^{-7}	6.13×10^6	2.58×10^{-4}
25,000	6.89×10^4	2.60×10^{-1}	2.14×10^5	2.59×10^{-7}	5.38×10^6	1.36×10^{-4}
50,000	6.40×10^4	3.33×10^{-1}	2.10×10^5	2.75×10^{-7}	5.46×10^6	2.22×10^{-4}

Table 4. Descriptive Statistics for Actual Values

Variable	N	Mean Deviation	Mean	Standard Deviation	Minimum	First Quartile	Median	Third Quartile	Maximum
Actual value	80,000	9,445.16	38.15	6,634.8	133.5	7,663.12	12,936.40	17,834.14	27,304.10

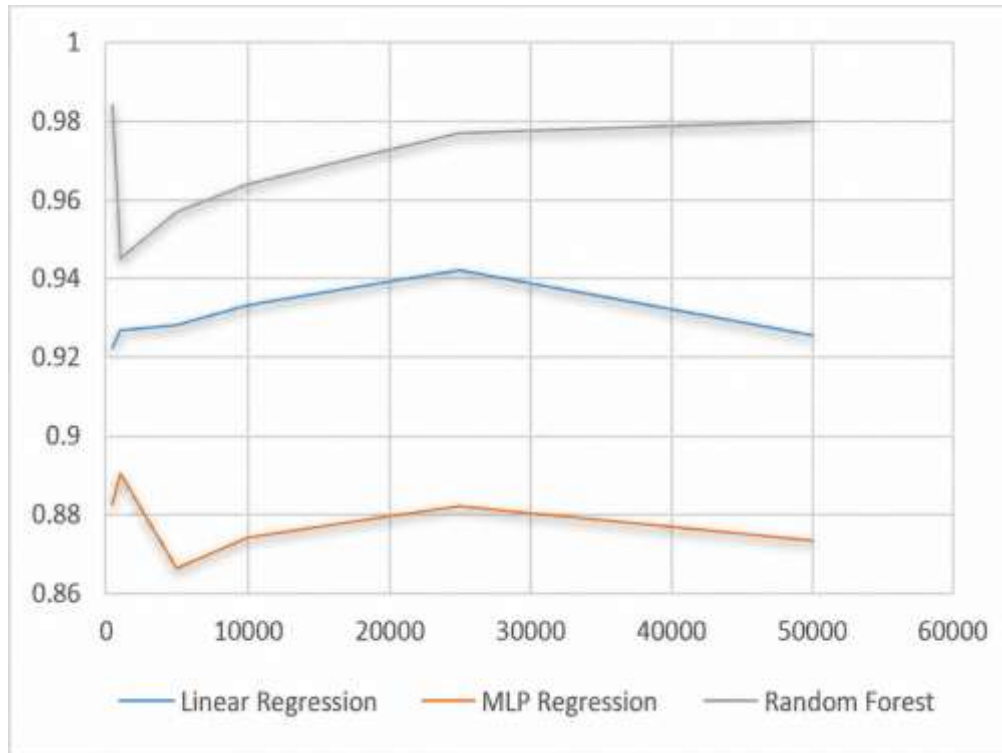


Figure 2. Coefficient of Determination (R^2) for Unscaled Data

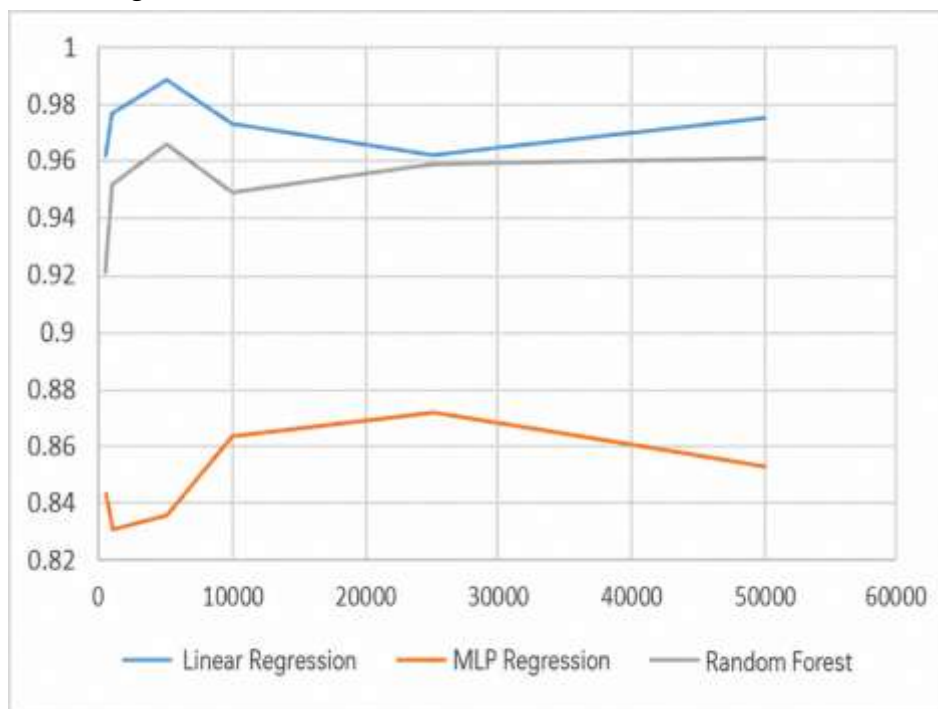


Figure 3. Coefficient of Determination (R^2) for Scaled Data

Based on the R^2 measure for both scaled and unscaled data, as illustrated in Figures 2 and 3, linear regression and MLP regression outperformed the Random Forest algorithm. Although the performances of linear regression and MLP regression became increasingly similar as the amount of training data increased, scaled MLP regression ultimately achieved superior performance compared with its competitors, attaining a maximum R^2 value of 0.98. The use of ANN is particularly advantageous when dealing with nonlinear relationships within datasets or models because of its capabilities in prediction and data fitting.

4. Discussion and Conclusion

The present study examined the factors affecting tax adjudication with the aim of developing an appropriate model for reducing the risk of tax arrears in adjudication centers. The findings demonstrated that the proposed model had satisfactory measurement properties and that the majority of the identified dimensions had statistically significant relationships with the appropriate tax adjudication model. More specifically, specialized training and updating professional knowledge, taxpayer awareness and transparency, professional ethics and administrative integrity, localization of the tax adjudication model, professional expertise and experience of adjudication panel members, effective interaction among taxpayers, tax auditors, and adjudicating authorities, digitalization and intelligent automation, pre-adjudication dispute-resolution mechanisms, speed and timeliness of proceedings, transparency and consistency of tax regulations, procedural justice and impartiality, tax arrears risk management, internal and external oversight, interinstitutional coordination, consequences of implementing the model, institutional effectiveness of dispute-resolution panels, quality of decision-making and reasoning, and quality of case documentation all had significant effects on the proposed model. In contrast, performance evaluation of adjudication centers and panels did not show a statistically significant effect. Overall, the findings indicate that reducing tax-arrears risk requires a multidimensional approach in which procedural, organizational, professional, technological, ethical, regulatory, and risk-management factors operate together rather than independently.

One of the strongest findings concerned the importance of professional expertise and experience among members of tax adjudication panels. The significant effect of this component suggests that technically complex tax disputes require decision-makers who possess sufficient knowledge of taxation, accounting, financial regulations, administrative law, and evidentiary principles. Greater expertise may reduce erroneous interpretations, inconsistent decisions, unnecessary appeals, and repeated referrals of cases, thereby shortening the time between assessment and final collection. This finding is consistent with evidence showing that characteristics of adjudicators can influence the resolution of tax disputes and that institutional decision-making is partly shaped by the professional attributes of those responsible for adjudication [19]. It also aligns with research demonstrating that professional representation and technical expertise can materially affect outcomes in tax litigation [20]. In the Iranian context, prior research has similarly emphasized the necessity of modernizing quasi-judicial tax dispute-resolution authorities and strengthening professional and institutional capabilities [16, 18]. These findings collectively suggest that the human-capital dimension of tax adjudication is central to both decision quality and arrears prevention.

Specialized training and the continuous updating of professional knowledge also significantly contributed to the model. This result complements the finding regarding professional expertise because tax laws, accounting practices, business models, reporting systems, and digital tax technologies evolve continuously. Adjudicators and tax officials who rely only on previously acquired knowledge may encounter difficulties when addressing new forms of corporate organization, tax planning, digital transactions, disclosure requirements, and tax incentives. Contemporary research demonstrates that corporate tax behavior increasingly interacts with innovation incentives, financing decisions, international reporting requirements, and organizational strategies [4, 11, 12]. Accordingly, continuous professional development is required if adjudication authorities are to assess increasingly complex disputes accurately and efficiently. This may also explain why specialized training emerged as a significant determinant of an appropriate tax adjudication model.

The significant effect of taxpayer awareness and transparency indicates that dispute prevention begins before a case reaches a formal adjudication body. When taxpayers clearly understand their legal obligations, documentation requirements, objection procedures, applicable deadlines, and the basis for assessments, the likelihood of avoidable disagreement may decrease. Transparency also reduces informational asymmetry between taxpayers and the tax administration. Research on tax avoidance and reporting has shown that disclosure mechanisms can influence tax-related behavior and reduce opportunities for strategic income manipulation [10, 11]. Similarly, evidence regarding corporate social responsibility and tax behavior indicates that transparency and accountability mechanisms are closely connected with compliance-related decisions [13, 14]. Within tax adjudication, therefore, taxpayer awareness can be interpreted as a preventive mechanism that reduces misunderstanding, improves the quality of objections, and facilitates earlier settlement of legitimate disputes.

The findings also demonstrated that professional ethics, administrative integrity, and the management of conflicts of interest significantly affected the proposed tax adjudication model. Tax adjudication depends heavily on trust because taxpayers must believe that their cases will be reviewed impartially and that adjudicators are not influenced by inappropriate organizational, financial, or personal interests. Weak administrative integrity can undermine acceptance of rulings, encourage repeated appeals, and increase resistance to payment. The significance of this factor is compatible with prior analyses of the Iranian tax adjudication system emphasizing principles of good administration, impartiality, legality, fairness, and accountability [18]. It also corresponds with research on the institutional causes of tax evasion, which has shown that noncompliance cannot be explained solely by taxpayer characteristics but is also influenced by administrative and institutional conditions [22]. Thus, ethical administration is likely to contribute indirectly to arrears reduction by increasing institutional legitimacy and taxpayers' willingness to accept final decisions.

Procedural justice and impartiality in adjudication were likewise significant. This finding indicates that efficiency in tax collection cannot be pursued independently of fairness. Taxpayers who perceive adjudication procedures as equitable, consistent, and unbiased may be more willing to accept adverse decisions, whereas perceptions of procedural unfairness may encourage continuation of disputes even when the underlying tax liability is relatively clear. The finding is consistent with the principles emphasized in comparative tax adjudication research and the European good-administration framework, which stress the importance of transparent procedures, impartial authorities, and reasoned decision-making [16, 18]. Moreover, evidence that judge characteristics can influence corporate tax dispute outcomes further highlights the importance of safeguards designed to minimize subjectivity and ensure consistency [19]. Procedural justice is therefore not merely a legal value; it can also function as a practical mechanism for reducing prolonged litigation and associated arrears.

Another important result was the significant effect of effective interaction and communication among taxpayers, tax auditors, and adjudicating authorities. Tax disputes frequently arise not only from substantive disagreements but also from incomplete explanations, missing documentation, inconsistent interpretations, or weak communication during earlier stages of assessment. Improved communication may enable the clarification of issues before they become entrenched disputes and can facilitate faster exchange of documents and evidence once adjudication has begun. Prior Iranian studies on delays in tax adjudication have emphasized the need to improve procedures and reduce unnecessary administrative obstacles [21]. Similarly, evaluations of tax adjudication authorities have pointed to gaps between existing and desirable institutional conditions, indicating a need for stronger administrative coordination and communication [17]. The present findings reinforce these conclusions by demonstrating that communication should be considered a structural component of tax-arrears risk reduction.

The significant relationship between digitalization and intelligent automation of the adjudication process and the proposed model is also notable. Digital systems can improve the registration, classification, tracking, and retrieval of tax cases; reduce document loss; support electronic communication; and enable managers to identify cases at risk of excessive delay. They can also facilitate risk-based prioritization and increase consistency in administrative workflows. Risk-based tax administration has already been emphasized in Iranian studies of tax auditing, where systematic risk assessment has been proposed as a means of improving resource allocation and audit efficiency [6, 7]. In a broader context, fiscal and regulatory environments have been shown to influence corporate behavior and innovation, highlighting the increasing importance of data-driven public administration [5, 23]. Therefore, intelligent case-management systems may contribute to arrears prevention by reducing processing times and allowing earlier identification of disputes with a high probability of delayed collection.

Pre-adjudication mechanisms and dispute resolution also had a significant effect. This finding suggests that formal adjudication should not necessarily be the first response to every disagreement. Administrative review, reconciliation, mediation-like procedures, clarification meetings, and other early-resolution mechanisms may prevent minor disputes from becoming lengthy formal cases. This interpretation is particularly important in light of evidence that litigation itself can sometimes be used strategically to defer tax payment [15]. If tax procedures allow taxpayers to benefit financially from prolonged litigation, the system may unintentionally create incentives for delay. Effective pre-adjudication mechanisms can reduce this risk by distinguishing genuine legal disagreements from cases that can be resolved administratively. Comparative research on modern tax adjudication systems also supports the value of institutionalized dispute-resolution mechanisms that reduce reliance on prolonged formal proceedings [16].

Speed, accuracy, and timeliness of proceedings showed a significant relationship with the appropriate tax adjudication model. This result has direct implications for tax-arrears risk because delays extend the period during which assessed taxes remain unresolved and potentially uncollected. Previous Iranian research has explicitly identified delays in tax adjudication as a policy concern and has proposed strategies for reducing procedural time [21]. Dynamic analysis of corporate income tax arrears has further demonstrated that tax debts evolve over time and that delayed collection can have cumulative effects on the stock of arrears [2]. However, the simultaneous significance of accuracy and decision quality in the present model indicates that speed should not be pursued through procedural shortcuts. Instead, efficient adjudication requires the reduction of unnecessary delays while preserving the evidentiary and legal quality of decisions.

Transparency and consistency of tax laws and regulations were also significantly associated with the model. Ambiguous or contradictory tax rules increase opportunities for different interpretations by taxpayers, auditors, and adjudicators, thereby creating disputes even where there is no deliberate attempt at evasion. Previous studies have shown that tax avoidance, tax evasion, and tax risk are influenced by regulatory, informational, and institutional conditions [8, 9, 22]. International evidence similarly indicates that taxpayers and firms respond strategically to specific regulatory and reporting environments [10, 12]. Therefore, regulatory consistency can reduce disputes at their source and improve predictability throughout the assessment and adjudication process.

Tax arrears risk management itself demonstrated a significant effect and had one of the larger path coefficients among the examined components. This finding supports the conceptual premise of the study: tax arrears should be actively managed as a risk rather than addressed only after liabilities have remained unpaid for extended periods. Previous Iranian research has directly developed a tax-arrears risk framework from a tax adjudication perspective, supporting the integration of dispute-resolution variables into arrears management [24]. Studies identifying the

causes of tax arrears have similarly shown that unpaid tax liabilities result from interacting administrative, economic, and procedural factors [1]. The present study extends this perspective by demonstrating that risk management should be embedded throughout the adjudication process, allowing authorities to classify, monitor, and prioritize cases according to the likelihood and consequences of noncollection.

Internal and external oversight also significantly contributed to the model. Oversight can increase consistency across adjudication centers, identify procedural deviations, detect integrity risks, and promote accountability for delayed or inadequately reasoned decisions. This finding is compatible with the broader literature on tax risk and administrative governance, which suggests that tax outcomes are affected by monitoring arrangements and institutional controls [6, 18]. However, oversight must be designed carefully so that it improves accountability without compromising the substantive independence of adjudicators. Effective oversight should focus on procedural quality, compliance with legal standards, timeliness, documentation, and consistency rather than pressuring panels toward predetermined fiscal outcomes.

Interinstitutional coordination within Iran's tax system had a statistically significant, although comparatively small, effect. The smaller coefficient may suggest that coordination plays a supporting rather than primary role in determining adjudication quality. Nevertheless, its statistical significance indicates that tax dispute resolution cannot function effectively when information and responsibilities are fragmented across administrative units. Coordination is particularly important where tax assessment, legal affairs, collection, enforcement, information technology, and adjudication are handled by different organizational units. Previous studies on Iranian tax adjudication and administration have emphasized structural and institutional reform, implying that the effectiveness of individual adjudication units depends partly on the broader institutional architecture in which they operate [16, 17].

The quality of decision-making and reasoning in panel rulings and the quality of documentation and case-information recording were both significant. Reasoned decisions make it possible for taxpayers to understand why their claims were accepted or rejected and allow higher review bodies to evaluate decisions more efficiently. High-quality documentation similarly reduces ambiguity, prevents repetitive requests for evidence, and ensures that adjudicators have access to complete information. These findings are consistent with evidence regarding the role of professional expertise and adjudicator characteristics in tax-dispute outcomes [19, 20]. They are also consistent with studies indicating that information quality and external professional scrutiny influence tax-related decisions [8, 9]. Better documentation and reasoning may therefore reduce both erroneous decisions and unnecessary appeals.

The effectiveness of the institutional structure of dispute-resolution panels and the consequences of implementing an appropriate adjudication model were also significant. These findings suggest that the effectiveness of tax adjudication depends on both organizational design and the broader outcomes generated by reform. A well-designed institutional structure should clarify jurisdiction, responsibilities, procedural stages, and lines of accountability, while implementation outcomes should be assessed in terms of reduced delays, improved consistency, lower arrears, and greater taxpayer confidence. This interpretation is aligned with previous comparative and domestic research emphasizing institutional modernization of tax adjudication [16, 17].

In contrast to the other components, performance evaluation of adjudication centers and panels did not have a statistically significant effect. One possible explanation is that performance evaluation, as currently conceptualized or practiced, may be too administrative or indirect to influence the substantive quality of adjudication. Evaluation systems may focus on quantitative indicators such as the number of cases processed rather than on decision quality,

fairness, consistency, or subsequent collection outcomes. Another possibility is that performance evaluation has an effect only when combined with meaningful feedback, accountability mechanisms, training, or organizational reform. Thus, the nonsignificant result should not necessarily be interpreted as evidence that evaluation is unnecessary. Rather, it may suggest that conventional performance indicators are insufficiently aligned with the objective of reducing tax arrears and should be redesigned to incorporate risk-based and quality-oriented measures.

Taken together, the findings demonstrate that tax-arrears reduction through adjudication requires an integrated governance approach. Contemporary tax behavior is affected by financing conditions, innovation incentives, disclosure requirements, corporate strategies, and institutional arrangements [4, 11, 12]. Taxation is also connected to investment, innovation, sustainability, and broader development outcomes [3, 5, 14]. Consequently, tax adjudication cannot be viewed merely as a technical stage for settling individual disagreements. An effective adjudication system can contribute to revenue predictability, compliance, administrative legitimacy, and fiscal sustainability by resolving disputes promptly, fairly, and on the basis of reliable information.

One limitation of the present study concerns its cross-sectional design, which captures experts' assessments at a single point in time and therefore does not permit strong conclusions regarding causal changes in tax-arrears risk over time. The study also relied on a researcher-developed questionnaire, meaning that responses may have been influenced by participants' professional perceptions and subjective judgments. Although the sample included professors, experts, and specialists familiar with taxation and tax adjudication, the findings may not fully represent the perspectives of taxpayers, attorneys, accountants, tax agents, or individuals directly involved in disputed cases. In addition, the model was developed within the Iranian tax-administration environment, and differences in legal systems, administrative structures, digital maturity, and tax cultures may limit direct generalization to other jurisdictions.

Future studies should examine the proposed model longitudinally and determine whether improvements in the significant dimensions are followed by measurable reductions in the volume, duration, and value of tax arrears. Researchers could compare different provinces, adjudication centers, taxpayer categories, and types of tax disputes to determine whether the relative importance of the identified components differs across contexts. Future research could also combine questionnaire data with administrative records, case-processing times, appeal rates, collection outcomes, and objective performance indicators. Comparative studies involving different national tax systems would be useful for distinguishing context-specific determinants from more universal principles of effective tax adjudication. Qualitative interviews with taxpayers, adjudicators, auditors, attorneys, and tax managers could also provide deeper explanations for the nonsignificant effect of performance evaluation and identify more appropriate indicators for evaluating adjudication centers.

From a practical perspective, tax authorities should develop an integrated reform program rather than addressing each component separately. Priority should be given to continuous professional training for adjudicators, transparent and standardized procedures, effective pre-adjudication dispute-resolution mechanisms, comprehensive digital case-management systems, improved communication with taxpayers, and risk-based monitoring of disputed liabilities. Adjudication panels should be provided with clear documentation standards and decision templates that encourage complete legal and factual reasoning while preserving their independence. Performance-evaluation systems should be redesigned so that they assess not only the number of cases processed but also timeliness, consistency, quality of reasoning, reversal rates, taxpayer accessibility, and subsequent collection outcomes. Strengthening coordination among assessment, collection, legal, information-technology, and

adjudication units can further ensure that high-risk disputed liabilities are identified early and managed before they become persistent tax arrears.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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References

- [1] Y. Isazadeh, "Identifying and Ranking the Causes of Tax Arrears in Pursuit of the Objectives of the Resistance Economy," presented at the Conference on Sustainable Development of Yazd Province within the Framework of the Resistance Economy, Yazd, 2015. [Online]. Available: <https://civilica.com/doc/468188>.
- [2] A. A. Mahdian Rad, "Simulation of Collection of Corporate Income Tax Arrears in a Dynamic Model," *Biannual Journal of Human Sciences Development*, vol. 3, no. 5, pp. 125-144, 2022, doi: 10.22047/hsd.2022.182872.
- [3] H. Izadkhasti and A. Arab Mazar, "Analysis of the Effects of Efficient Fiscal and Tax Policies on Private Investment in Iran: Emphasizing Corporate Income Tax and Government Fiscal Indiscipline," *Tax Research Journal*, no. 32, p. 11, 2016.
- [4] R. Benkraiem, S. Gaaya, F. Lakhal, and M. Kilic, "Access to Finance and Corporate Tax Avoidance: International Evidence," *Journal of International Accounting, Auditing and Taxation*, vol. 58, p. 100668, 2025, doi: 10.1016/j.intaccudtax.2024.100668.
- [5] W. Melnik and A. Smyth, "R&D Tax Credits and Innovation," *Journal of Public Economics*, vol. 236, p. 105157, 2024, doi: 10.1016/j.jpubeco.2024.105157.
- [6] J. Barzegar Khaneghah and M. Ghadak Foroushan, "Designing a Tax Risk Measurement Model and Examining Its Effect on the Value of Companies Listed in the Iranian Capital Market," *Auditing Knowledge*, vol. 13, no. 51, p. 2, 2020.
- [7] N. Khosravipour, M. Hamidian, and M. R. Abdi, "Presenting a Risk-Based Tax Audit Model for Small and Medium-Sized Enterprises (SMEs) in Iran," *Tax Research Journal*, vol. 27, no. 44, pp. 9-46, 2019.
- [8] A. Khani, K. Imani, and M. Mollaei, "The Relationship Between Auditor Industry Specialization and Corporate Tax Avoidance," ed, 2014.
- [9] D. Foroughi, M. H. Fadavi, and A. Hajiannezhad, "Examining the Effect of Tax Avoidance Policies on the Type of Auditor's Report in Companies Listed on the Tehran Stock Exchange," *Tax Research Journal*, vol. 25, no. 73, pp. 181-199, 2015.
- [10] W. Jiang, C. Zhang, and C. Si, "The Real Effect of Mandatory CSR Disclosure: Evidence of Corporate Tax Avoidance," *Technological Forecasting and Social Change*, vol. 179, p. 121646, 2022, doi: 10.1016/j.techfore.2022.121646.
- [11] S. Bai and J. Zheng, "Country-by-Country Reporting, Corporate Tax Avoidance, and Supply Chain Structure: A Bunching Analysis Based on Income Manipulation by Chinese Multinational Corporations," *Pacific-Basin Finance Journal*, vol. 88, p. 102570, 2024, doi: 10.1016/j.pacfin.2024.102570.
- [12] J. Xiang, Q. Shao, and Y. Fan, "Innovation Incentives and Corporate Tax Avoidance: Evidence from China," *Economic Analysis and Policy*, vol. 85, pp. 1216-1237, 2025, doi: 10.1016/j.eap.2025.01.019.
- [13] D. Zhu, Z. Luo, and H. Qin, "Does Reduced Tax Avoidance Affect CSR? Evidence from a Quasi-Natural Experiment in China," *Economic Analysis and Policy*, vol. 85, pp. 479-493, 2025, doi: 10.1016/j.eap.2024.12.018.

- [14] A. Haladu, S. A. Bin-Nashwan, A. Yusuf, and N. A. Yaro, "Lighting the Path to Sustainable Development: The Impact of Sustainability Disclosure, Corporate Tax, and Economic Growth," *World Development Perspectives*, vol. 37, p. 100655, 2025, doi: 10.1016/j.wdp.2024.100655.
- [15] S. Marjit, S. Mishra, and S. Mitra, "Tax Evasion by Tax Deferment: Sham Litigation with an Informal Credit Market," *European Journal of Political Economy*, vol. 69, p. 102008, 2021, doi: 10.1016/j.ejpoleco.2021.102008.
- [16] J. Ghanavati and S. Houshmandi, "Modern Approaches to Tax Adjudication in Quasi-Judicial Authorities with Emphasis on Dispute Resolution Systems in France, England, and Germany," *Law of New Technologies*, vol. 2, no. 3, pp. 193-219, 2021.
- [17] A. Shirzad Takchi and J. Karimi Jashni, "Examining the Current and Desired Status of Tax Adjudication Authorities in the Iranian National Tax Administration," presented at the Sixth International Conference on Economic and Management Studies in the Islamic World, Tehran, 2020. [Online]. Available: <https://civilica.com/doc/1179094>.
- [18] A. Hajipour Kandaroud, A. Banaazadeh Ardebili, and R. Moradi Balargou, "An Analysis of the New Tax Adjudication System in Iran with Reference to the European Code of Good Administrative Behaviour," *Modern Research in Administrative Law*, vol. 6, no. 19, pp. 385-412, 2024.
- [19] B. P. Lindsey, S. McDonnell, and W. J. Moser, "Do United States Tax Court Judge Attributes Influence the Resolution of Corporate Tax Disputes?," *Journal of Accounting and Public Policy*, vol. 42, no. 6, p. 107156, 2023, doi: 10.1016/j.jaccpubpol.2023.107156.
- [20] K.-F. Huang, C.-H. Lin, C.-H. Wu, and H.-D. Wang, "Tax Agent Ad Litem's Impact on Estate and Gift Tax Cases of Administrative Litigation," *Asia Pacific Management Review*, vol. 23, no. 2, pp. 86-94, 2018, doi: 10.1016/j.apmr.2017.09.001.
- [21] A. Yavari and H. Edrisian, "Strategies for Reducing Delays in Tax Adjudication," *Encyclopedia of Economic Law*, vol. 25, no. 14, pp. 1-26, 2018.
- [22] J. Ghanbarinejad, M. Salehi, and A. Pifeh, "Examining Factors of Tax Evasion in Free Trade-Economic Zones," *Computational Economics Journal*, vol. 2, no. 4, pp. 69-95, 2023.
- [23] W. Chen, Y. Zhu, Z. He, and Y. Yang, "The Effect of Local Government Debt on Green Innovation: Evidence from Chinese Listed Companies," *Pacific-Basin Finance Journal*, vol. 73, p. 101760, 2022, doi: 10.1016/j.pacfin.2022.101760.
- [24] M. S. Sayyah, M. Fallah Shams, A. A. Arab Mazar, and R. Gholami Jamkarani, "Designing a Tax Arrears Risk Model with a Tax Adjudication Approach," *Investment Knowledge Quarterly*, vol. 11, no. 44, pp. 335-361, 2022.