

Leveraging Artificial Intelligence for Enhanced Tax Collection in Pakistan



ECONOMIC POLICY
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Authored By
Muhammad Mubasal
Economic Analyst

Pakistan faces significant fiscal challenges characterized by one of the lowest tax-to-GDP ratios at 9% in FY24. As outlined in the Budget FY25, the government has prioritized increasing tax collection efficiency and expanding the tax base as critical economic objectives. This brief examines how Artificial Intelligence (AI) technologies can transform Pakistan's taxation system to achieve these goals, drawing insights from global best practices and Pakistan's current revenue performance.



9% **FY 24**
Tax-to-GDP ratio

Current Tax Landscape in Pakistan

According to the FBR Biannual Review (July–December, FY 2024–25), Pakistan's tax collection has shown promising growth, with revenue increasing by 25.9% (Rs. 1,155.6 billion) compared to the previous fiscal year, reaching Rs. 5,624.85 billion against a target of Rs. 6,009 billion. This represents an achievement rate of 93.6%, indicating room for enhancement in collection efficiency. The review reveals a heterogeneous performance across different tax heads: Direct Taxes increased by 29.4% (Rs. 632.7 billion), Sales Tax by 25.3% (Rs. 382.9 billion), Federal Excise Duty by 31.0% (Rs. 82.0 billion), and Customs Duty by a more modest 10.7% (Rs. 58.0 billion).

Notably, Income Tax Withholding showed significant growth in key areas: Salaries (59.2%, Rs. 98.8 billion), Contracts (25.2%, Rs. 60.3 billion), and Bank Interest & Securities (16.2%, Rs. 35.6 billion). Domestic Sales Tax exhibited strong performance in sectors like Electrical Energy (53.5%, Rs. 98.7 billion) and Cement (47.7%, Rs. 15.6 billion), while simultaneously experiencing declines in Cigarettes (–26.1%, Rs. –6.9 billion) and Natural Gas (–14.9%, Rs. –3.7 billion).

While the Federal Board of Revenue (FBR) has made strides in revenue collection, Pakistan's tax-to-GDP ratio remains considerably below regional and global benchmarks. Current estimates place it between 9–10%, compared to an average of 16–17% for comparable developing economies, and well below the 15% minimum threshold recommended by the IMF for sustainable economic development. This substantial gap underscores the urgent need for innovative approaches to not only improve compliance among existing taxpayers but also to identify and integrate the vast informal sector into the tax net, which by some estimates constitutes up to 35% of Pakistan's economy.

AI Applications for Enhanced Tax Collection

Artificial intelligence offers transformative potential for Pakistan's tax administration in several key areas:

Predictive Risk Assessment and Fraud Detection

AI systems can analyze vast datasets to identify patterns and anomalies that may indicate tax evasion or fraud. By implementing machine learning algorithms trained on historical tax declarations and transactions, the FBR can develop sophisticated risk scoring mechanisms to flag potential non-compliance. This would allow for more targeted audit selection, focusing limited resources on high-risk cases while reducing the burden on compliant taxpayers.

The FBR Biannual Review indicates declining collections in several areas including cigarettes (-26.1%), natural gas (-14.9%), and organic chemicals imports (-6.8%). These negative trends in traditionally reliable revenue streams warrant closer examination. For instance, the cigarette industry, despite known consumption patterns, shows a concerning revenue decline that could potentially signal illicit trade or production underreporting.



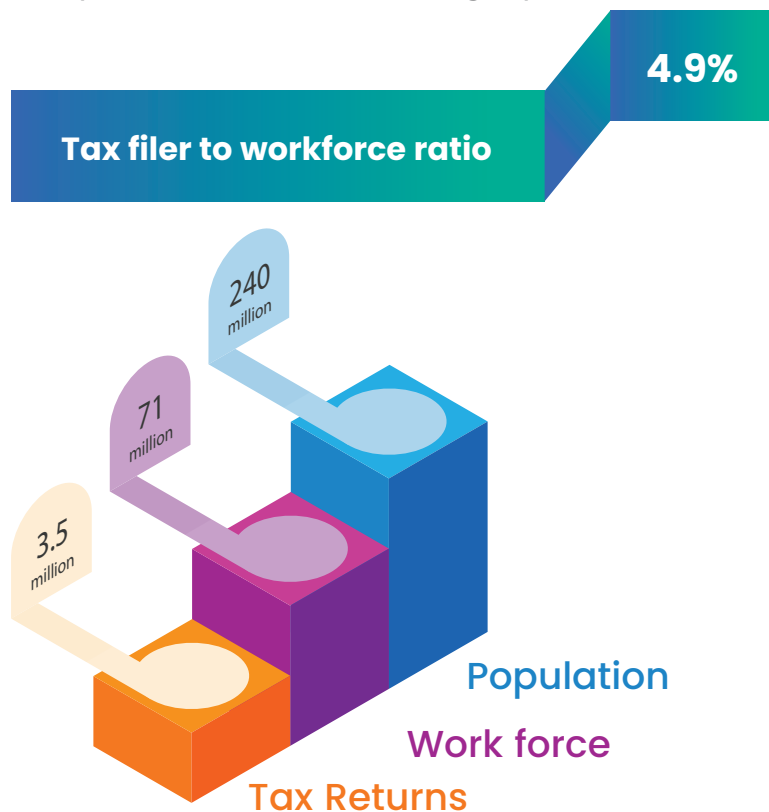
Looking at import trends, while dutiable imports increased by 13.2% in value terms (reaching Rs. 4,702.4 billion), certain categories like oil seeds (-32.7% in quantity) and coffee/tea (-10.1% in quantity) showed substantial declines despite stable or growing consumption patterns in the domestic market. AI analytics could identify misclassification or valuation issues at customs points. Conservative estimates suggest that addressing just these specific anomalies through targeted AI-powered enforcement could recover Rs. 15-20 billion in additional revenue annually.

Expanding the Tax Base Through Data Integration

One of Pakistan's most pressing challenges is bringing more individuals and businesses into the tax net. The FBR data indicates that only approximately 3.5 million tax returns were filed in fiscal year 2024, in a country with a population of 240 million and a workforce of over 71 million. This yields a tax filer to workforce ratio of merely 4.9%, pointing to a substantial untapped tax base. Additionally, the FBR Biannual Review shows significant variations in sectoral tax compliance, with certain high-potential sectors remaining undertaxed.

AI can play a crucial role by integrating and analyzing data from multiple sources banking transactions, property registries, utility bills, vehicle registrations, and social media to identify potential taxpayers who are currently outside the system. For instance, analysis of electricity consumption patterns from the **283.2 billion** rupees collected in electrical energy sales tax could help identify commercial activities operating under residential classifications.

Machine learning algorithms can establish correlations between consumption patterns, lifestyle indicators, and declared income to highlight discrepancies that warrant further investigation. Analysis of the Rs. 54.3 billion collected from property transactions (Sections 236K and 236C) could reveal patterns of frequent traders operating without commercial tax registration. This data-driven approach could significantly expand Pakistan's tax base without requiring extensive manual intervention, potentially bringing an additional 2-3 million taxpayers into the formal system within a 3-year implementation period.



Enhancing Taxpayer Services and Compliance

As demonstrated in countries like Singapore and Korea, AI-powered virtual assistants can dramatically improve taxpayer experience while reducing administrative costs. Singapore's implementation resulted in a 50% reduction in call center inquiries, representing significant operational savings. Applied to Pakistan's context, similar efficiencies could potentially save hundreds of millions in administrative costs annually.

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The FBR data shows that voluntary payments in Pakistan increased by 29.3% during July–December FY 2024–25, reaching Rs. 1,115.6 billion. This represents a substantial portion (40.1%) of the total Rs. 2,781.6 billion in direct taxes collected. More specifically, advance tax payments grew by 27.2% to Rs. 916 billion, while returns-based payments increased by 40.3% to Rs. 199.6 billion. This positive trend could be further strengthened through improved taxpayer services.

By analyzing the Rs. 47.6 billion "Collection on Demand" category (which grew by 27.1%), AI systems could identify common compliance issues and proactively guide taxpayers to avoid these pitfalls. Economic research suggests that when taxation processes become more transparent and accessible, voluntary compliance typically increases by 15–20%. For Pakistan, this could translate to an additional Rs. 167–223 billion in voluntary payments annually, based on current collection figures.

Advanced Analytics for Policy Formulation

AI can transform the way tax policies are designed and evaluated by enabling sophisticated modeling of potential impacts. By analyzing historical data and running simulations, policymakers can better understand how proposed tax measures might affect different economic sectors and demographic groups before implementation.

The FBR data reveals significant sectoral disparities that could benefit from such analysis. *For example, while electrical energy sales tax increased by 53.5% (reaching Rs. 283.2 billion) and cement by 47.7% (Rs. 48.3 billion), sectors like natural gas declined by 14.9% (to Rs. 21.1 billion) and food products by 16.5% (to Rs. 8.9 billion). Similarly, in excise duties, services saw an 83.5% increase (Rs. 9.0 billion) while aerated water decreased by 17.5% (Rs. -3.6 billion).*

These variations indicate uneven tax burden distribution across economic sectors. AI modeling could simulate, for instance, how adjusting the effective tax rate on cigarettes (which currently shows a 2.4% decrease in FED collection) by specific increments would impact revenue while accounting for consumption elasticity and illicit trade risks. The model could incorporate the Rs. 102.9 billion currently collected from cigarette FED and project revenue impacts of policy changes with higher precision than traditional methods. Such data-driven approaches could optimize tax policy to achieve a potential 5–8% revenue enhancement (approximately Rs. 5–8 billion) in targeted sectors without increasing overall tax burden on the economy.

Implementation Framework for Pakistan

To effectively leverage AI for enhanced tax collection, Pakistan should consider the following structured approach:

Data Infrastructure Development

The foundation of any AI system is high-quality data. The FBR must prioritize the digitization of tax records and operational manuals while establishing protocols for data quality assurance. The data architecture must accommodate the scale of operations involved: processing tax returns annually, managing Rs. 5.6 trillion in collections across multiple tax heads, and monitoring approximately Rs. 7.7 trillion in imports (as recorded in July–December FY 2024–25).

Additionally, integrating disparate data sources (banking, property, utilities, etc.) will require both technical solutions and regulatory frameworks to ensure proper data sharing while protecting privacy.

Phased Technology Deployment

Rather than attempting a comprehensive overhaul, Pakistan should implement AI solutions in phases, beginning with high-impact, low-risk applications. Based on the FBR data, the following prioritization makes economic sense:

Virtual Taxpayer Assistant

Target deployment focusing initially on frequently asked questions and common procedures.

Predictive Compliance Models

Implementation focusing initially on the Rs. 1,590.9 billion withholding tax stream, which comprises 57.2% of direct tax collection.

Automated Data Matching Systems

Deployment targeting the identification of discrepancies between customs declarations (Rs. 4,702.4 billion in dutiable imports) and internal market transactions.



Human Resource Development

The success of AI integration depends heavily on having qualified personnel who can develop, maintain, and interpret these systems. Pakistan must invest in training tax officials to work alongside AI tools, focusing on developing analytical skills rather than routine processing capabilities.

A structured capacity-building program would create a specialized cadre of data-savvy tax professionals capable of leveraging AI insights to enhance collection efficiency. This transition would enhance tax officials capacity who can verify and complement AI outputs.

Governance and Ethics Framework

As noted in international experiences, maintaining trust is crucial for tax administration. Pakistan must establish clear ethical guidelines for AI use, ensuring that systems are transparent, fair, and explainable. This includes implementing robust oversight mechanisms to identify and address potential biases or errors in AI systems.

This governance structure is particularly important given the Rs. 1,155.6 billion growth in collections, ensuring that increased enforcement does not disproportionately impact certain sectors or taxpayer segments.

Conclusion

Artificial intelligence offers Pakistan an opportunity to address traditional tax administration challenges and improve both revenue collection and tax base expansion. By strategically implementing AI solutions with proper attention to data infrastructure, human capacity, and ethical considerations, the FBR can transform its relationship with taxpayers while improving efficiency.

The growth trends observed in the FBR Biannual Review are noteworthy, with collections increasing by 25.9% to reach Rs. 5,624.9 billion in the first half of FY 2024-25. However, this still represents 93.6% of the target (Rs. 6,009 billion), indicating room for improvement. The review shows varying performance across different tax heads: direct taxes increased by 29.4%, sales tax by 25.3%, federal excise duty by 31.0%, and Customs Duty by 10.7%.

The data reveals specific areas where AI intervention could be particularly beneficial. For instance, the substantial growth in voluntary payments (29.3% increase) and withholding taxes (26.0% increase) suggests that enhancing taxpayer services could further strengthen these positive trends. Similarly, the decline in certain sectors such as cigarettes (-26.1% in domestic sales tax), natural gas (-14.9%), and organic chemicals imports (-6.8%) indicates areas where improved monitoring and compliance mechanisms could help recover revenue.

By focusing on the actual collection patterns revealed in the FBR Biannual Review, Pakistan can develop a targeted AI implementation strategy that addresses specific weaknesses in the current system while building on existing strengths. The Rs. 1,155.6 billion year-on-year growth demonstrates positive momentum that can be further enhanced through strategic technological adoption.

This technological transformation would not only help increase revenue but could fundamentally alter the perception of taxation from a burdensome obligation to a transparent, fair, and shared responsibility, ultimately strengthening the social contract between citizens and the state.

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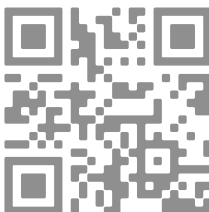
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Contact

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051 8840099 | 051 8840019

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