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The Effect of E-Taxation on Revenue Generation in Pakistan

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ABSTRACT

This study focuses to examine the impact of implementation of e-taxation on Pakistan's revenue and economic growth. The study assessed how the implementation of E-taxation in 2009 has affected Tax to GDP ratio and Tax Revenue. In this study quantitative method was used and postanalysis was applied among various kinds of Quasi experimental research. Findings revealed that introduction of E-taxation has significant impact on revenue generation and tax-to-GDP ratio. There was significant increase in tax revenue and tax to GDP ratio after implementation of e-taxation. It was also found that the phase after the introduction of mobile application achieved the highest tax revenue collection. It was

recommended to continue investing in the infrastructure of e-taxation and raising awareness about its advantages to foster higher compliance and efficiency.
Keywords: E-Taxation, Tax-to-GDP ratio, Tax Revenue

INTRODUCTION

This research aims to examine the effect of e-taxation on revenue generation in Pakistan. Through a quantitative analysis, the study seeks to uncover the challenges, opportunities, and effectiveness of e-taxation initiatives in bolstering revenue streams for the Pakistani government. The findings aim to inform policymakers, tax authorities, and stakeholders about the dynamics of e-taxation and its potential to enhance revenue generation in the context of Pakistan's economic landscape. E-taxation refers to the process of utilizing electronic means, such as the internet and computer systems, for the filing, payment, and administration of taxes. It encompasses various electronic tax filing systems and online platforms provided by governments to facilitate tax-related transactions for individuals and businesses. The research aims to explore the relationship between the implementation of E-taxation systems and revenue generation in Pakistan. It seeks to assess the extent to which E-taxation has influenced tax compliance and collection efficiency in the country.

South African Revenue Service (SARS) electronic-filing (e-filing) is South Africa's official online tax return submission portal. It was first launched in 2001 through a third-party company but was later taken over in 2006 by SARS. In the 2015/16 tax year, SARS electronic-filing handled 36,80 million e-submissions and payments, accounting for 98.7 percent of all e-submissions/payments to SARS across the country (SAnews,2016). According to SARS, "e-filing" is a free online process for filing returns and declarations, as well as offering other related services. By focusing on the unique context of Pakistan, this research will contribute to the existing body of knowledge on E-taxation. While some studies have been conducted on the impact of E-taxation in other countries, there is a lack of research specifically addressing the Pakistani context. Therefore, this study will provide valuable insights into the effectiveness of E-taxation in Pakistan and its implications for revenue generation.

The research will employ rigorous research design and methodology, including data collection and analysis. Statistical analysis will be conducted to examine the relationship between E-taxation and revenue generation. The findings of this research will contribute to a better understanding of the impact of implementing E-taxation systems in Pakistan, thereby informing policymakers and tax authorities in their decision-making processes. The Federal Board of Revenue (FBR) in Pakistan was established on April 1, 1924 as Central Board of Revenue, it was renamed to FBR in 2007. It is the country's premier federal tax collection agency responsible for administering and enforcing various federal tax laws in Pakistan. In recent years, the FBR has introduced innovative digital solutions to further enhance e-taxation in Pakistan. This includes the development of mobile applications for tax registration and filing, online tax calculators, and electronic tax notices. These digital tools have not

only made tax compliance more accessible but have also helped to bridge the gap between taxpayers and tax administration. FBR offers e-filing tax system to reduce the tax compliance cost, increase compliance rate and facilitate tax payers to use these services anywhere at any time (Ullah et al., 2021).

The journey towards e-taxation in Pakistan can be traced back to the late 1990s when the government began exploring the use of technology to streamline tax administration. Initial efforts focused on digitizing tax records and introducing rudimentary electronic filing systems for income tax returns. These early initiatives laid the foundation for the digitization of tax processes and paved the way for more comprehensive e-taxation solutions. Over the years, the government of Pakistan has made concerted efforts to expand and modernize its e-taxation infrastructure. This includes the introduction of online tax portals, electronic payment systems, and taxpayer facilitation centers across the country. These initiatives aimed to improve taxpayer convenience, enhance compliance, and reduce the administrative burden on both taxpayers and tax authorities. The electronic filing system is realized as not just offering more advantages to the tax authorities, but also advantageous for taxpayers (Ullah et al., 2021). Hassan et al. (2021) concluded that the impact of tax compliance simplicity is positive to anticipate the voluntary tax compliance behavior. He also found that impact of perception of fairness is positive to foresee the voluntary tax compliance behavior.

PRAL (Pakistan Revenue Automation) Pvt Ltd is a leading technology company in Pakistan that specializes in providing automation solutions for tax and revenue collection processes. In 2003, PRAL was established as a subsidiary of the FBR. The FBR holds a majority stake in the company. PRAL offers a wide range of services and solutions to government organizations, primarily focusing on tax and revenue collection. Some of its key services are the development and implementation of tax management information systems, design and deployment of electronic tax filing and payment systems, provision of taxpayer services and helpdesk support. The automation solutions developed and implemented by PRAL have significantly transformed tax and revenue collection processes in Pakistan. These solutions have helped streamline operations, enhance transparency, reduce administrative burdens, and increase compliance levels. They have also facilitated better taxpayer services and improved revenue mobilization for the government. PRAL plays a crucial role in driving the digital transformation of tax and revenue administration in Pakistan through its innovative technology solutions and collaborative partnerships with government agencies. The State Bank of Pakistan (SBP) and the Federal Board of Revenue (FBR) have jointly implemented the online collection of government taxes and duties through the one-link facility. This will apply to the payment of Income Tax, Sales Tax, Excise, and Custom duties.

This system is designed to improve payment systems, especially in terms of revenue collection. It will also facilitate taxpayers, reduce leakages, and contribute to revenue generation by reducing the chances of inefficiency in the tax collection machinery. Empirical studies show that electronic tax collection leads to revenue growth. Therefore, advances in tax collecting mechanism related to digitization will

help taxpayers and improve revenue collection. More importantly, it will help in reducing the time spent on tax payments by traditional methods. For example, a lot of small and medium businessmen claim that they spend a lot of time on going to banks and tax offices to pay various taxes, which adds to their total tax compliance costs. Therefore, it will reduce the cost for the taxpayers. Hassan et al. (2021) found that the simplicity of tax compliance has a larger effect on tax filing than perception about tax morale and government spending.

E-filing

It refers to the electronic filing of tax returns and related documents, was introduced by the FBR in Pakistan in 2009. The implementation of E-filing aimed to modernize and streamline the tax filing process, making it more convenient and efficient for taxpayers. It allowed individuals and businesses to submit their tax returns electronically, eliminating the need for manual paperwork and reducing processing time. Since its introduction, E-filing has become an integral part of the tax administration system in Pakistan. It has facilitated greater transparency, improved accuracy in tax reporting, and enhanced the efficiency of tax collection processes. The FBR continues to promote and encourage the use of E-filing as a means to simplify tax compliance and increase taxpayer convenience. Because of e-filing the procedure shifts away from paper base filling to e-filling. In 22 July,2019, the e-taxation system innovates to CNIC (Computerized National Identity Card) and NTN (National Tax Number), this innovation can streamline tax collection processes and enhance compliance. Government tax systems can integrate CNIC and NTN databases to ensure accurate identification of taxpayers. This integration can help in tracking taxpayers' financial transactions and ensuring compliance with tax laws. This can contribute to modernizing tax administration, improving compliance, and enhancing the overall efficiency and effectiveness of e-taxation systems in collecting revenue and promoting economic growth.

Being the primary entity that collects taxes for the government FBR has the responsibility of maximizing tax collection to generate enough revenue for Pakistan's economic growth. Hence to increase tax revenue through greater compliance, FBR introduced electronic tax filing system through IRIS website, The main reason of implementing e taxation was to facilitate the taxpayers so they can have access to the system anytime and anywhere at their own ease and also to minimize the cost associated with filing tax through papers (Khurram & Arshad, 2024).

The Integrated Revenue Information System (IRIS) was introduced by the Federal Board of Revenue (FBR) in Pakistan as part of its efforts to modernize tax administration and enhance efficiency in tax collection. IRIS was officially launched in 2013 and started in 2018. Since its inception, IRIS has undergone continuous updates and enhancements to improve its functionality and effectiveness in facilitating e-taxation processes in Pakistan. Pakistan's largest e-filing system, IRIS is one of the best integrated systems in the country that encompasses various subsystems into one larger system. IRIS is a centralized platform for taxpayers to interact with FBR. PRAL implements technology solutions for tax data management, automating various processes and driving data analysis in ensuring tax compliance & improving

efficiency of tax administration. In 19 september,2019, FBR Assan app is a mobile application launched by the Federal Board of Revenue (FBR) in Pakistan. The purpose of the app is to facilitate taxpayers in Pakistan by providing them with a user-friendly platform for tax-related services and information.

Problem Statement

Studies have been conducted on the impact of E-taxation in other countries but there is a significant research gap in addressing its effect in Pakistani context. Existing research provides very limited practical insights into how the implementation of e-taxation have impacted revenue collection, administrative efficiency and tax compliance in Pakistan. This study addresses this gap by assessing the impact of e-taxation on tax revenue generation and its wider implications for economic landscape of Pakistan. This study will contribute to the global discourse about e-taxation by concentrating on Pakistan's distinctive socio-economic and technological circumstances and provide valuable insights for tax administrators and policymakers aiming to improve revenue collection and compliance. The findings aim to inform policymakers, tax authorities, and stakeholders about the dynamics of e-taxation and its potential to enhance revenue generation in the context of Pakistan's economic landscape.

Research Objective

The objective of this research is to investigate the effect of E-taxation on tax revenue generation in Pakistan, examining that whether implementation of e-taxation system have an effect on tax revenue generation in Pakistan.

Expected Outcomes

The government of Pakistan relies heavily on taxes to finance its infrastructure and recurring development costs. This study will enrich information for other government agencies planning to introduce an electronic tax system. This study also explains to tax administrators how the e-tax system has significantly increased tax compliance in all sectors of Pakistan.

It will also be useful in further studies for students and researchers who want to understand the practical perspective of taxation. It helps the students to know and appreciate the practical e-tax system of the government. The study also contributes to the existing literature and can serve as a basis for further research in the area of e-tax system and tax compliance in Pakistan.

The scope of research is the taxation sector in Pakistan. It involves examining the impact of electronic taxation systems on revenue generation within the Pakistani context. This research will include analyzing the adoption and implementation of e-taxation platforms, such as online tax filing systems and digital payment mechanisms, by the Federal Board of Revenue (FBR) in Pakistan. It will assess the extent to which these technological innovations have improved tax revenue collection for the government. The study will draw upon quantitative data analysis technique.

LITERATURE REVIEW

Tax is considered an important source of revenue to ensure sustainable economic development for the developing countries' governments. A recent survey of

International Centre for Tax and Development (ICTD) states that about 80 percent of the total revenue of about half of countries of the world's source is tax revenues (Ullah et al., 2021). Tax is a fee for public services. It is not a charity nor is it based upon the will of tax giver, it's regulated forcefully by the government and it's the reason that avoidance of tax is a punishable crime by law (Nawaz et al., 2022). Citizens are bound to pay taxes without the expectation of any direct compensation (Khurram & Arshad, 2024). Aguolu (2014) defines tax as a compulsory levy imposed by a government agency on the earnings, spending, and assets of its citizens. This encompasses salaries, bonds, interest, dividends, rebates, royalties, corporate oil revenues, capital gains, and capital transfers. Electronic taxation, or e-taxation, is the electronic management and collection of taxes through digital platforms. It provides taxpayers with online access to services such as tax identification number registration and electronic tax filing (Olaoye & Atilola, 2018; Wasao, 2014). Che-Azmi and Kamarulzaman (2014) highlight e-taxation as a method employed by governments globally to leverage information and communication technologies for financial management, enhancing public service delivery and administrative transparency.

The Electronic Tax System, as described by Wasao (2014), serves as an online interface enabling taxpayers to access various services offered by tax authorities via the internet. Resource mobilization, crucial for companies, involves strategic marketing and sales initiatives aimed at generating revenue.

Government revenue refers to the funds received by the government from various sources over a specific period (Ofurum et al., 2018). These sources include taxes on income, property, business profits, imports, and exports, as well as revenues from government-owned enterprises and tax-exempt entities such as national banks. Additionally, government revenue may comprise external loans and commitments from international financial institutions (Ofurum et al., 2018). Electronic tax registration entails the acquisition of a taxpayer identification number (TIN) by the taxpayer. To obtain an individual TIN, the taxpayer must complete the requisite form, which necessitates documentation verifying the individual's status and true identity. These documents, along with the completed form, are then submitted to the designated address for verification by the relevant tax authorities (Umenweke & Ifediora, 2016). To initiate this process, the taxpayer must access the tax office's website, register with their email address, and download the necessary forms. Required information includes the taxpayer's name, address, identification number, income details, tax exemptions, and any outstanding taxes or payments. Once the tax return is completed, the taxpayer signs it with a self-selected identification number and submits it electronically to the tax office. Upon submission, the tax office acknowledges receipt of the tax return via email. Within 48 hours, the tax return is evaluated, and taxes are calculated. If errors are detected, the sender is notified to rectify and resubmit the return (Umenweke & Ifediora, 2016).

Technological advancements significantly influence fiscal administration and taxation procedures. The information and telecommunication sector, particularly in Nigeria, has been pivotal in driving the internet economy (Abiola, 2014). The use of technology to enhance tax administration, improve taxpayer services, and boost

compliance has gained prominence globally (Dowe, 2008; Olaoye & Kehinde, 2015). The advent of information and communication technology (ICT) has posed challenges to traditional tax systems (Muita, 2011). Digital innovations create significant improvements in making a new multi-tier tax administration as well as more equitable and efficient policy options(Ahmad, 2024). E-tax systems, however, offer solutions by improving interactions between tax authorities and taxpayers. They provide tax officers with enhanced information quality and quantity, enabling faster and more accurate transactions (Wasao, 2014).

Abiola and Asiweh (2012) emphasized the importance of appropriate human resources and equipment in achieving effective tax administration in Nigeria. They highlighted weaknesses in management and organizational approaches in tax policy implementation, attributed to inadequate tools, staffing, funding, poor infrastructure, and insufficient public awareness. They concluded that the prevalent paper documentation in tax systems often leads to mutilation and falsification of figures by both tax officers and taxpayers, while the lack of essential social amenities like electricity discourages tax compliance. Ul Hameed et al. (2023) concluded that the prevalence of tax evasion was increased due to the high levels of corruption inside local authorities.

Good governance is a fundamental role of government, encompassing the provision of security, welfare, and essential services to the populace. Failure to deliver these basic amenities in exchange for taxes paid may lead to taxpayer reluctance. Tax administration faces numerous challenges, including economic, environmental, educational, structural, political, social, constitutional, cultural, and religious factors. Hassan et al. (2021) concluded that the simplicity of tax compliance has a big impact on filing tax than tax morale and perception about government spending. Arshad and Khurram (2021) found that in Pakistan men are more likely to continue using the service of tax e-filing than women, it shows the need for improvement and upgrade in the government services such as e-filing by integrating both genders preferences so that greater adoption and sustained usage of the services can be confirmed. Further, he stated that the rate of e-tax filing in Pakistan in general is very low, even from small group of citizens filing their tax returns electronically the most are men.

Ahmed et al. (2021) recommended that the FBR should keep on trying to make the online system more user friendly as electronic filing remains a less utilized service by taxpayers or Pakistani individuals even after the countless efforts of FBR to promote e-filing use in Pakistan. It was also stated that even now the number of users of the electronic filing system is very low because of poor returns filing knowledge, using the electronic system and financial literacy. Khalid and Nasir (2020) stated that high compliance cost demotivated people to comply and to file there tax returns. “This cost consists of the number of hours required for record keeping, tax planning, and forms completion and submission. It takes around 577 hours (per year) to complete the tax payment process in Pakistan compared to the world average of 108 hours” (p. 464). Khurram and Arshad (2024) found that e-tax filing is still regarded as a difficult process as it involves understanding of tax concepts and laws. Also, it requires a taxpayer to take out enough time to perform the task as it is a lengthy process.

Moreover, the tax filing system is not user-friendly or easy to navigate and understand for a taxpayer as it is burdened with confusing content and a lot of forms without sufficient guidance about each form to a particular taxpayer.

Taxation involves government-mandated contributions or levies on citizens, property, income, commodities, transactions, etc., aimed at raising revenue for government expenditure. Chatama (2013) conducted studies on the impact of ICT on taxation in Tanzania, concluding that ICT applications affected both the design and administration of the tax system. ICT facilitated consistent record-keeping, timely access to records, and faster processing of returns, thereby enhancing tax revenue performance. E-taxation, defined as the electronic collection and administration of tax procedures, has emerged as a vital tool for governments worldwide to streamline tax processes and enhance public service delivery (Che-Azmi & Kamarulzaman, 2014).

The inception of e-tax payment systems dates back to the late 20th century. In the United States, electronic tax payment was first introduced in 1986, followed by Australia in 1987 and Canada in 1993. Other developed nations such as Malaysia and the Netherlands adopted electronic tax payment systems in 2009. In Africa, Uganda implemented its electronic tax payment system in 2009, with Egypt following suit in March 2013, aligning with international trends towards automated payment systems and e-government initiatives. A notable example of local government involvement in electronic revenue payment systems is the case of Karu Local Government Council (Karu LGC) in Nigeria. In 2015, Karu LGC partnered with an ICT firm, Byte works Technology Solution Ltd, and Interswitch to introduce the E-Revenue payment system (Okunowo, 2015). This initiative aimed to enhance revenue generation and taxpayer accessibility by enabling tax payments from various locations and at any time. The E-Revenue system implemented by Karu LGC includes features such as a centralized database for taxpayer information, generation of Harmonized Demand Notices, receipt generation, and payment monitoring. The system effectively blocks revenue leakages and mandates all revenue payments to be made strictly through the platform, allowing taxpayers to use their preferred bank for transactions. Electronic taxation and payment systems have become integral components of modern tax administration, facilitated efficient revenue collection and enhanced taxpayer convenience. The global adoption of e-taxation reflects the ongoing digital transformation in public service delivery and underscores the importance of leveraging information and communication technologies for effective governance.

Lai (2008) conducted a comprehensive examination of the effect of e-filing on revenue generation in Malaysia. The study utilized both primary and secondary data sources, employing survey research design along with descriptive and regression analyses. Results indicated that taxation significantly contributes to revenue generation and Gross Domestic Product (GDP) in Malaysia. Additionally, tax evasion and tax avoidance were found to have a significant effect on revenue generation. Amabali (2009) investigated the antecedents of paperless income tax filing by young professionals in India, utilizing regression analysis. The study identified factors such as perceived ease of the tax system, personal innovativeness in information technology, relative advantage, performance of filing service, and compatibility as key

determinants of paperless filing among young professionals.

Pippin and Tosun (2014) examined electronic tax filing trends in the United States, analyzing demographic, socioeconomic, and geographic factors influencing e-filing rates. Regression analysis was employed using secondary data from the IRS Statistics of Income Division, the Bureau of Economic Analysis, the Bureau of Labor Statistics, and the census bureau. The study revealed lower e-filing rates in rural communities with low populations and a lower share of females. Surprisingly, educational attainment was negatively correlated with e-filing rates and growth. Nasir (2015) investigated the implementation of electronic tax filings and payments in Malaysia, emphasizing the benefits of maintaining an efficient e-tax system over a manual one. Secondary data from Malaysian Inland Revenue reports from 2004 to 2011 were analyzed using trend analysis. The study highlighted the challenges initially faced, including adaptation issues, uncertainty, security concerns, and technological exposure. However, from 2006 to 2011, there was a significant increase in e-filing users, leading to improved compliance and reduced time spent on tax collection. The study concluded that well-implemented electronic tax systems benefit both taxpayers and tax authorities, contributing to a better standard of living for citizens.

Elements of the electronic tax payment system in Nigeria, as elucidated by Abdulrazaq (2015), include the facilitation of online payment for various taxes such as Value Added Tax (VAT), Petroleum Profits Tax (PPT), Capital Gains Tax (CGT), and Companies Income Tax (CIT). Moreover, taxpayers can seamlessly execute payments directly from their bank accounts, courtesy of the collaboration between FIRS and NIBSS. Additionally, the system streamlines processes for obtaining tax clearance certificates and facilitates the verification of Tax Identification Numbers (TINs). It also enables electronic exchange of information between taxpayers and FIRS officials and automates the imposition of fines and penalties for late submissions or payments. The advent of e-taxation and e-payment systems marks a transformative shift in tax administration globally, enhancing efficiency, transparency, and taxpayer compliance. The Nigerian context underscores the pivotal role of such systems in revenue generation and administrative facilitation.

An electronic tax system, also known as an online tax system, represents a computerized tax administration framework designed to manage tax processes seamlessly, from taxpayer registration to payment processing and tax return submission (Muturi & Kiarie, 2015). This system leverages information technology to streamline tax operations, facilitating online registration, filing of tax returns, payments, and database maintenance, thereby eliminating the need for paper-based returns. In essence, the emergence of electronic tax systems signifies a paradigm shift towards digital tax administration, leveraging internet technology, web-based platforms, and software to enhance tax compliance and administrative efficiency. Economic growth signifies the sustained increase in a nation's productive capacity and is often measured by the growth of gross national product over time, resulting in improved well-being and increased diversity among citizens (Inyiama & Ubesie, 2016; Okwori & Sule, 2016). It is imperative that the rate of economic output growth

surpasses population growth to meet the needs of the populace (Chigbu & Njoku, 2015). Real Gross Domestic Product (GDP) is a conventional measure used to quantify improvements in a nation's economy (Jones & Ekwueme, 2016).

In an empirical review, Ethel and Onuorah (2021) investigated the impact of e-tax payments on revenue generation in Nigeria. Utilizing data from the Federal Inland Revenue Service tax report and Central Bank of Nigeria Statistical Release and Quarterly Economic Reports spanning from the first quarter of 2012 to the second quarter of 2018, they employed the Ordinary Least Square Method for analysis. The study found that while e-company income tax payments had a positive albeit statistically insignificant effect on revenue generation, e-capital gain tax payments had a negative and statistically insignificant impact. Ofurum et al. (2018) conducted a study to assess the impact of E-taxation on Nigeria's revenue and economic growth. They analyzed data sourced from the Federal Inland Revenue Service and CBN statistical economic reports from the second quarter of 2013 to the fourth quarter of 2016. Their analysis, employing paired sample t-tests and simple regression, revealed that the implementation of electronic taxation in 2015 did not result in improved tax revenue. Recommendations included the organization of enlightenment seminars nationwide to enhance awareness and utilization of electronic tax services.

Allahverd, Alagoz, and Ortakapoz (2017) conducted an analysis to assess the impact of the e-tax assessment framework on tax revenue and cost in Turkey. The study utilized secondary data obtained from the Turkish revenue authority, which was examined across two periods: the pre-electronic tax era spanning from 1993 to 2004, and the post-electronic tax era covering 2005 to 2016. Data analysis was performed using the Mann-Whitney U Test. Additionally, the research provided insights into the electronic transformation of the tax system and the structure of the Turkish Tax System. The empirical results of the research were that the transition to e-tax system positively affected tax revenues and also reduced the cost per tax.

The Australian National Audit Office (2015) notes that e-taxation was first introduced in the USA in 1986 and in Australia in 1987 through modernization programs. By 1993, Canadian taxpayers began electronic filing of tax returns, and in 2009, Malaysia, Netherlands, and Uganda introduced electronic tax payments for their taxpayers. In March 2013, Egypt launched electronic tax payment services to align with international trade trends towards automated payment systems, especially for government services. Nigeria adopted e-taxation in 2015 when the FIRS, in collaboration with the Inter-bank Settlement System (NIBSS), implemented the technology in the country's tax system (Okunowo, 2015). The introduction aimed to enhance financial collection, administration, and taxpayer services, reduce compliance costs, and improve tax compliance. E-tax systems, replacing paper-based tax reporting, promise faster processes, lower costs, and increased efficiency. FIRS has a centralized Information Communication Technology (ICT) department providing support services in electronic systems to achieve increased revenue collection and facilitate voluntary taxpayer compliance.

The economic growth of a country depends on the resources and its capacity of revenue generation, in order to meet the infrastructural needs and daily

expenditures. Normally, the resources required for all activities are produced by a structured tax system (Malik & Meraj, 2024). Governments pay for the public expenditure and settle their financial obligations through revenues generated from taxes. The state authorities are still having difficulties in achieving tax compliance in many developing countries like Pakistan (Hassan et al., 2021). The concept of revenue has been defined by various scholars. According to the Longman Dictionary of Contemporary English, as cited in Edogbanya and Ja'afaru (2013), revenue is defined as the money that a business or organization receives over a period of time, especially from selling goods or services. Additionally, it describes revenue as the money that the government receives from taxes. Fayemi (2011) provides a comprehensive definition of revenue, stating that it encompasses all forms of income to the government, such as taxes, rates, fees, fines, duties, penalties, rents, dues, proceeds, and other receipts that the legislature has the power to appropriate. He further classifies government revenue into two kinds: recurrent revenue and capital revenue. Edogbanya and Ja'afaru (2013) define revenue as the funds generated by the government to finance its activities. They further clarify that revenue refers to the total funds generated by the government (federal, state, local) to meet their expenditure for a fiscal year, representing the grand total of income received from sources from which expenses are incurred.

The modern tax administration focuses on three key objectives: facilitating voluntary compliance, providing adequate tax records for easy communication of information, and efficiently minimizing the cost of collection (Oseni, 2015). These objectives have driven the prevalent use of IT systems in tax administration. The adoption of information technology in core tax processes such as registration, filing of returns, payment, and general maintenance of databases has led to the development of electronic-based tax systems, commonly referred to as e-tax. Electronic tax system is defined as the automation of core tax processes, offering electronic registration, filing, payment, as well as education and information to taxpayers. It serves as a comprehensive internet portal providing secure self-service options to taxpayers, available 24/7 without requiring intervention from tax administrative staff.

Asra (2022) states that tax compliance in Pakistan can be increased by improving the perception of taxes in people mind by offering a more equitable system of taxation which also incorporates wealth redistribution as taxation system of Pakistan is not equitable. There is ignorance about tax payment in Pakistan. To increase tax revenue and tax compliance documentation of economy is very necessary. Khurram Baig et al. (2023) also concluded that to understand their duties according to the law and their accountability for paying taxes, awareness programs must take place for the taxpayers to foster a favorable culture for the voluntarily payment of taxes. Nawaz et al. (2022) also stated that Pakistan should make its taxation system progressive and efficient so that the favorable outcome of revenue generation activity from public may be put into success of people of the country. (Malik & Meraj, 2024) recommended that endorsing effective tax policies can make a steady flow of revenue which promotes growth by necessary public investments and services

The Kenya Revenue Authority rolled out the Electronic Taxation System in

2013, conducting it through Business Process Improvement (BPI) to increase the scope of electronic interaction with taxpayers and enhance staff productivity and taxpayer service. Challenges in electronic tax systems include implementation, use, and maintenance, requiring reliable internet access and adequate financing for appropriate infrastructure setup in tax offices (Maisiba & Atambo, 2016). Khurram and Arshad (2024) also found problems relating to the dimensions of system quality which acted as barriers in adoption of e tax filing in Pakistan. These were language barriers, ineffective tutorial, penalty unawareness and service quality i.e. unawareness of taxpayers about education and support through Taxpayer Facilitation Centers and helpline.

The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), initially formulated by Davies in 1989 and later refined by Venkatesh and Bala in 2008, posits that an individual's inclination to adopt a new system is influenced by two primary factors: perceived usefulness and perceived ease of use (PEOU). Perceived usefulness refers to the extent to which a user believes that the system will enhance their efficiency and effectiveness in performing tasks. Meanwhile, PEOU denotes the user's expectation that the system will be intuitive and require minimal effort to operate. In the context of e-taxation in Pakistan, TAM can be applied to understand and predict taxpayers' acceptance and utilization of electronic tax filing and payment systems. Here, perceived usefulness would relate to the taxpayers' belief that e-taxation systems simplify the tax filing process, provide timely access to information, and streamline interactions with tax authorities. Perceived ease of use, on the other hand, would involve taxpayers' perceptions of how user-friendly and accessible the e-taxation platforms are, including factors such as navigation, form submission, and feedback mechanisms. By examining taxpayers' perceptions of the usefulness and ease of use of e-taxation systems, tax authorities in Pakistan can assess the potential adoption rates and identify areas for improvement to enhance user acceptance and compliance. Additionally, TAM can assist in comparing different e-taxation platforms or identifying user groups with varying acceptance levels, thereby informing targeted interventions and resource allocation strategies to promote the successful implementation of e-taxation initiatives.

The Theory of Innovation Translation

The Theory of Innovation Translation, conceptualized by Arthur Tatnall in 1990, diverges from the traditional Theory of Innovation Diffusion by emphasizing adaptability and customization of innovations to suit the specific needs of adopters. Rather than adopting innovations in their original form, potential users modify them to align with their existing systems and requirements. In essence, adopters tailor innovations to fit their unique contexts rather than adopting them verbatim.

RESEARCH METHOD

Ex-post facto (quasi experimental) research design was adopted as the data was already available. Among the different types of quasi experimental research design Pre - Post (difference in time) method was applied as it was the most appropriate for the

investigation. This method by comparing the average change in the outcome variable over time for the treatment group to the average change over time for the control group, determines the impact of a treatment (i.e., an explanatory variable or an independent variable) on an outcome (i.e., a response variable or dependent variable). This method best suited this investigation because the revenue generated through tax was divided into two groups i.e., before and after introduction of e-taxation.

Revenue collected through tax was divided into two groups before and after introduction of e-taxation and paired sample t-test was used to see the difference. In the same way difference in tax to GDP ratio was observed by dividing the data in two groups before and after e-taxation and paired sample t-test was run. ANOVA test was also used to see the change in outcome of Tax Revenue and Tax to GDP ratio in three phases: Manual filling, filing through online software and through mobile application (Tax Asaan App). SPSS (Statistical Package for Social Sciences) tool was used for data analysis.

Sample and Data:

Secondary data was collected from Pakistan Bureau of Statistics and Federal Board of Revenue (FBR). The data collected were yearly tax revenue and GDP. Data was collected from years 1996 – 2023.

Variable Description:

Tax Revenue:

The data of tax revenue was sourced from the official website of FBR. Data collected was from 1996 to 2023. Data was collected for 28 years and further divided into two groups of 14 years each i.e., before and after the implementation of e taxation. The difference between the two groups was analyzed through SPSS by running Sample paired t-test. Further ANOVA test was also run by dividing the data into three groups according to phases of manual filing (1996-2009), filing through website (2009-2019) and through mobile application (2020-2023).

Tax to GDP ratio:

The data of GDP was collected from Pakistan Bureau of Statistics and was divided by the tax revenue data collected from FBR to obtain tax to GDP ratio. Data was collected for 28 years and further divided into two groups of 14 years each i.e., before and after the implementation of e taxation. The difference between the two groups was analyzed through SPSS by running Sample paired t-test. Further ANOVA test was also run by dividing the data into three groups according to phases of manual filing (1996-2009), filing through website (2009-2019) and through mobile application (2020-2023)

ANALYSIS AND DISCUSSION

Descriptive Statistics are shown in the following table, The value of skewness is less than 1 it means that data is not skewed and its distribution is relatively symmetric. Value of kurtosis is less than 1 which means data is normally distributed. These low values of skewness and kurtosis also assure the normality and reliability of data which makes it suitable for more inferential statistical analysis. Mean of tax revenue before e-taxation is less than post e-taxation which means tax generated after

implementation of e taxation is higher. Mean of tax-GDP ratio of post e taxation is higher than pre e-taxation it means that e taxation increases tax to GDP ratio. Standard Deviation is less than 1 which means there is less deviation in the data.

Table 1 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Tax Revenue Before E taxation	14	282.25	1161.20	572.1179	269.94792	1.074	.597	.352	1.154
Tax Revenue After E taxation	14	1327.40	7163.80	3413.1714	1717.96469	.915	.597	.376	1.154
Tax-GDP Before E taxation	14	.0651	.0844	.075453	.0058827	-.246	.597	-.995	1.154
Tax-GDP After E taxation	14	.0784	.0981	.086405	.0063224	.595	.597	-.791	1.154
Valid N (listwise)	14								

First T test between two groups one of tax revenue collected from 1996-2009 second of tax revenue collected from 2010-2023 before and after e-taxation showed the following results. In the following table the output for paired sample statistics is shown. The mean value before implementation of E-taxation is 572.1179 billion and after implementation is 3413.1714 which shows a very significant positive impact.

Table 2 Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before E-Taxation	572.1179	14	269.94792	72.14662
	After E-Taxation	3413.1714	14	1717.96469	459.14538

In the following table the correlation coefficient is 0.984 which is almost 1, it indicates a very strong positive linear relation between tax revenue collected pre and post e-taxation. The p value (sig = .0) is smaller than 0.05 which indicates that

correlation is very significant meaning the observed relationship is unlikely to be because of random chance. This significant correlation shows consistent trend in the tax revenue collected before and after e-taxation periods. As the correlation doesn't directly imply causation, the significant relation complements the finding that e-taxation has improved the tax collection process. It shows that the positive changes after e-taxation implementation align with the previous trends but are potentially

Table 3 Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before E-Taxation & After E-Taxation	14	.984	.000

Table 4 Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Before E-Taxation - After E-Taxation	-2841.05357	1453.05390	388.34499	-3680.02192	-2002.08523	-7.316	13	.000

increased by the new system.

In the following table the mean of the pair is -2841.05457 which is in negative, it means that yearly mean value of post e taxation is 2841.05457 higher than pre-e-taxation. 0.000 significance value shows that there is a positive relation between the two groups. The value of $p < 0.05$ means the data is different in two times in simple words implementation of e taxation creates an impact on tax revenue.

Second pair of t-test was conducted between two groups of tax to GDP ratio i.e., one group of manual filing and one after the implementation of e taxation. In the following table the output for paired sample statistics is shown. The mean value before implementation of E-taxation is .075 or 7.5% and after implementation is .086 or 8.6% which shows a significant positive impact. This means that the introduction of e-taxation has increased the tax collected relative to GDP. The standard deviation values of both groups are very small, which indicates that observations are consistent around the mean values. It shows that although there is variation in the tax to GDP ratio, it is not very large which is sign of the reliability of the mean values. The mean value after implementation of e taxation is higher which means tax to GDP ratio was higher in post e taxation observation.

Table 5 Paired Samples Statistics

Table 6 Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Tax to GDP ratio before E Tax & Tax to GDP ratio after E tax	14	.143	.626

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Tax to GDP ratio before E Tax	.075443	14	.0058806	.0015717
	Tax to GDP ratio after E tax	.086391	14	.0063164	.0016881

In the following table the correlation value of .143 shows a very weak relation between the tax to GDP ratio before and after the implementation of e-taxation. There is very little consistency in linear trend between these two groups. The p value of .626 is much greater than common threshold of 0.05. It indicates that the weak correlation observed is not statistically significant. The relation between the two variables can be due to random chance rather than meaningful association.

Table 7: Paired Samples Test

	Paired Differences	t	df	Sig. (2-

									tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Tax to GDP ratio before E Tax - Tax to GDP ratio after E tax	-.0109481	.0079913	.0021358	-.0155622	-.0063341	-5.126	13	.000

Paired sample tests are shown in the following table. P < 0.05 shows a positive relation between the two groups i.e., E-Taxation has a positive impact on tax to GDP ratio. The mean of the pair is -.0109481 or -1.1% which is in negative, it means that yearly mean value of post-e-taxation for tax to GDP ratio is 1.1% higher than pre-e-taxation. The low value of standard deviation (.0079913), which is very small, indicates that the differences between the pre and post e-taxation tax to GDP ratios are relatively consistent of all data points. The low mean standard error assures the precision of the mean difference estimate. The confidence interval of the mean differences is entirely negative which confirms that after e-taxation tax to GDP ratio is consistently higher than that of before e-taxation. The p value of .000 indicates that the ratio between tax to GDP ratio before and after e-taxation is very significant. These findings strongly support the idea that e-taxation had a positive impact on improving the tax to GDP ratio.

To conclude, the weak correlation means that the trends or patterns of the tax to GDP ratios do not align in a linear way before and after the implementation of e-taxation. This could suggest that systematic changes or external factors disrupt the preceding patterns. Despite the weak correlation, the significant value of .000 shows that tax to GDP ratio overall improved after the implementation of e-taxation, the introduction of e-taxation caused an upward shift in the baseline which led to a higher average.

ANOVA test was conducted on the three phases of manual filing (1996-2009), software filing (2009-2019) and mobile application era (2020-2023). Two variables yearly collected tax revenue and tax to GDP ratio were taken as dependent variables. Following results were extracted.

Table 8 ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
Tax Revenue	Between Groups	81208943.190	2	40604471.595	69.491	.000
	Within Groups	14607723.633	25	584308.945		
	Total	95816666.823	27			
Tax to GDP	Between Groups	.001	2	.000	10.832	.000

	Within Groups	.001	25	.000		
	Total	.002	27			

The value of $p < 0.05$ means the data is different in two times. The resultant value of p means the e taxation has a positive impact on tax revenue and tax to GDP ratio, this means the objectives of the study are achieved by these results. This test confirms that tax to GDP ratio and Tax revenue differs significantly between the phases of manual filing, software filing and mobile application era. This shows that tax collection and efficiency have improved progressively by the advancements in e-taxation technologies.

FINDING AND CONCLUSION

Findings revealed that tax revenue collected and tax to GDP ratio after implementation of e taxation were higher than the manual filing phase. It was further revealed that tax revenue was most collected in the mobile application phase and has the most contributions toward GDP. Nawaz et al. (2022) also found that tax revenue increased from 2008-2020 as compared to non-tax revenue. He found that while overall revenue of government increased but there was an upsurge in the tax revenue proportion in that time period. Adegboye et al. (2022) also stated that there is a significant relationship between the GDP of the economy and its tax revenue. Okoye and Olayinka (2021) also found that internally generated revenue increased after implementation of e-taxation. It can be attributed to the facility offered to taxpayers in terms of place, cost and time. Nneka Francisca (2022) also concluded that in contrast to the manual system of tax revenue generating that was plagued by many issues the post online tax period is highly favored. Otekunrin et al. (2021) concluded that e-taxation improved revenue generation by reducing tax evasion and improving tax compliance. Malik and Meraj (2024) also found a significant positive relationship between economic growth and taxation. He further stated that direct and indirect taxation policies contribute meaningfully to growth of GDP.

Conclusion

The effect of e taxation on revenue generation in Pakistan was examined in this study, focusing on its impact on tax to GDP ratio and country's tax revenue. Paired sample t-test and ANOVA analysis of the data showed that e-taxation implementation improved tax revenue and tax to GDP ratio. The results show that the transition from manual filing to electronic filing including software based and mobile application filing systems significantly improved efficiency and revenue collection.

The implementation of e-taxation systems contributed to reducing evasion, streamlining tax process and improving compliance which is evidenced by the upward movement in average tax metrics through the e-taxation era. Also, the analysis shows that the phase of mobile application achieved the highest revenue generation, stressing the advantages of upgrading to advanced digital tools.

These findings propose that e-taxation not only upgrades and improve tax administration but also play a significant role in improving government income streams. The study emphasizes the significance of continued investment in the

infrastructure of e-taxation and raising consciousness about its advantages to foster higher compliance and efficiency. In order to maximize the potential of electronic taxation policy, makers are encouraged to focus more on an equitable tax system and documenting the economy.

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