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Pakistan Journal of Social Sciences

ISSN (E) 2708-4175 ISSN (P) 2074-2061
Volume 44: Issue 3 September 2024
Journal homepage: https://pjss.bzu.edu.pk

Withholding Tax and Financial Inclusion: A Time-Series Analysis of Pakistan's Fiscal Policy

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ARTICLE DETAILS

History:
Accepted: 15 August, 2024
Available Online: 04 September, 2024

Keywords:
Withholding Tax, Financial Inclusion, Fiscal Policy, Private Deposit Ratio, Currency in Circulation

ABSTRACT

Purpose: This study examines the impact of withholding tax on banking transactions and its effect on financial inclusion in Pakistan—where the hidden economy is large.

Design/Methodology/Approach: The study utilizes monthly time-series data from January 2005 to June 2022 and employs the Autoregressive Integrated Moving Average (ARIMA) intervention model to analyze the effects of six withholding tax interventions on financial inclusion.

Findings: The results indicate that withholding tax interventions generally reduced financial inclusion in Pakistan. Specifically, withholding tax increases in 2008 and 2015 reduced the private sector deposit ratio and increased currency in circulation, while a tax reduction in 2012 temporarily improved financial inclusion. However, subsequent reductions in 2018 and 2021 again led to a decline in financial inclusion, suggesting that such interventions either had a negative impact or were irrelevant to financial inclusion.

Implications/Originality/Value: The findings of this study highlight the ineffectiveness of withholding tax on banking transactions as a tool for enhancing financial inclusion—with implications for fiscal policy in Pakistan and other emerging economies such as Argentina and India. The study suggests that the finance divisions of these countries should reconsider the implementation of banking transaction taxes, as they may hinder progress toward sustainable development goals.

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Recommended Citation:

Nasir, A. M., Ahmed, R. Ayyoub, M. Tahir, M. (2024). Withholding Tax and Financial Inclusion: A Time-Series Analysis of Pakistan's Fiscal Policy. *Pakistan Journal of Social Sciences*, 44(3), 443-457. DOI: 10.5281/zenodo.13683111

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1. Introduction

Withholding tax is one of the largest components of income tax collection in Pakistan. It comprised 72 percent of total collections of income tax in the financial year 2020-21 (Government of Pakistan, 2021). This withholding tax is a combination of the collection of advance taxes from various components of the economy. Among others, withholding tax on banking transactions has remained among the ten largest sources of withholding tax collections.

For instance, in the financial year 2008-09, the withholding tax on cash withdrawal were 4.7 percent of total withholding taxes (Government of Pakistan, 2009). The withholding tax on cash withdrawals aimed to reduce the currency in circulation and enhance the documentation of economic transactions. In other words, this specific tax is implemented to enhance the financial inclusion of the economy (Government of Pakistan, 2006).

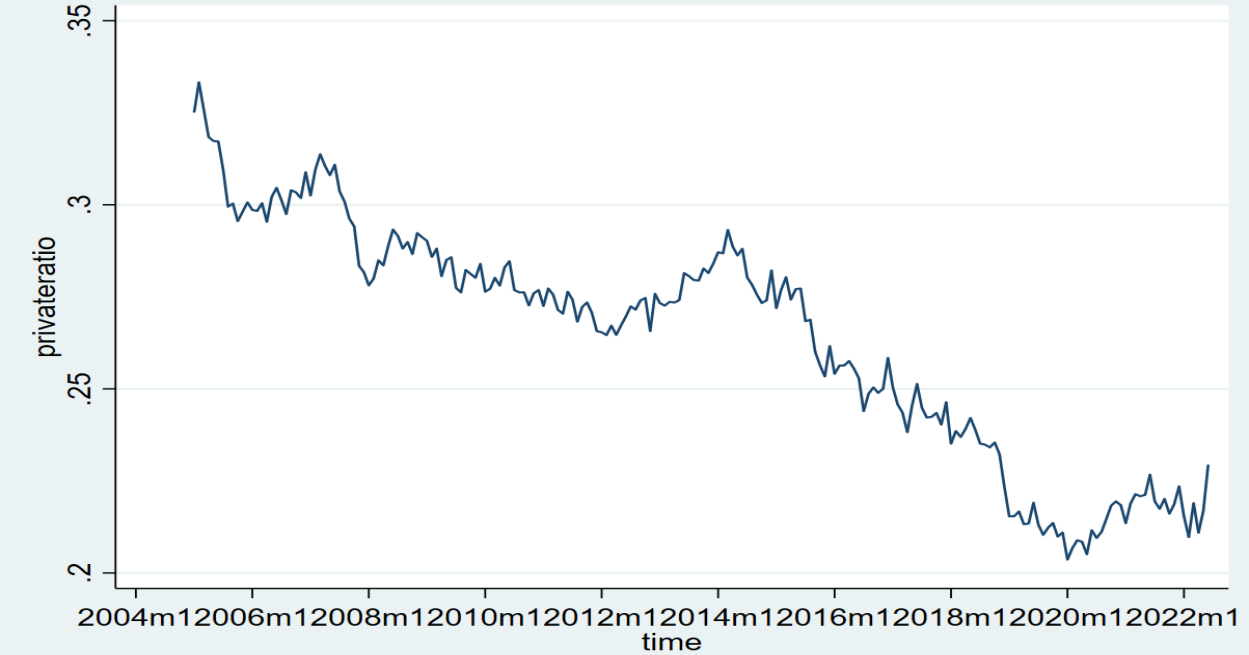
With this objective, withholding tax on cash withdrawal increased exponentially since its initiation in 2004 to Rs.15 billion in the financial year 2020-21 (Government of Pakistan, 2021). Convinced by this growth of withholding tax on cash withdrawal, the ministry of finance increased the withholding tax rate from 0.1 percent to 0.2 percent in the fiscal year 2005-06, 0.3 percent in 2008-09 and further increased to 0.6 percent for the non-filers—the individuals and organizations, who do not report their earnings to the federal board of revenue—in 2015-16 (Aazim, 2017; Ali, 2007; Government of Pakistan, 2006, 2009, 2017). This withholding tax was introduced in the fiscal plan of 2004-05. The initial rate was 0.1 percent on cash withdrawals of more than Rs. 25,000 per transaction. In the financial year-2005-06, the limit of Rs. 25,000 was fixed on per day basis. Later on, this limit was increased to Rs. 50,000 per day in the financial year 2012-2013 (Ali, 2007; Government of Pakistan, 2005, 2013, 2017).

In addition, the finance department initiated a withholding tax on non-cash banking transactions in the fiscal year 2015-16, where a withholding tax of 0.4 percent was charged on local remittances of greater than Rs. 50,000 per day. This tax was implemented only for non-filers. This tax aimed to enhance the number of filers and to help improve financial inclusion (Aazim, 2017; Government of Pakistan, 2017).

However, as reported by Government of Pakistan (2017), with the introduction of withholding tax on non-cash banking transactions, private sector business entrepreneurs decided to boycott the banking transactions, and they reduced the deposits in the banking system. Additionally, the currency in circulation also increased.
Though, the State Bank of Pakistan (SBP) data shows that the private sector deposits to total resident deposit ratio is decreasing since the inception of withholding tax on cash withdrawal. Figure 1 shows this slowdown of private sector deposits. Figure 1 reveals that the ratio of private sector deposits to total resident deposits was 32 percent in 2004, which decreased to 22 percent in June 2021.

Figure 1

Private Sector Deposits to Total Resident Deposit Ratio over time

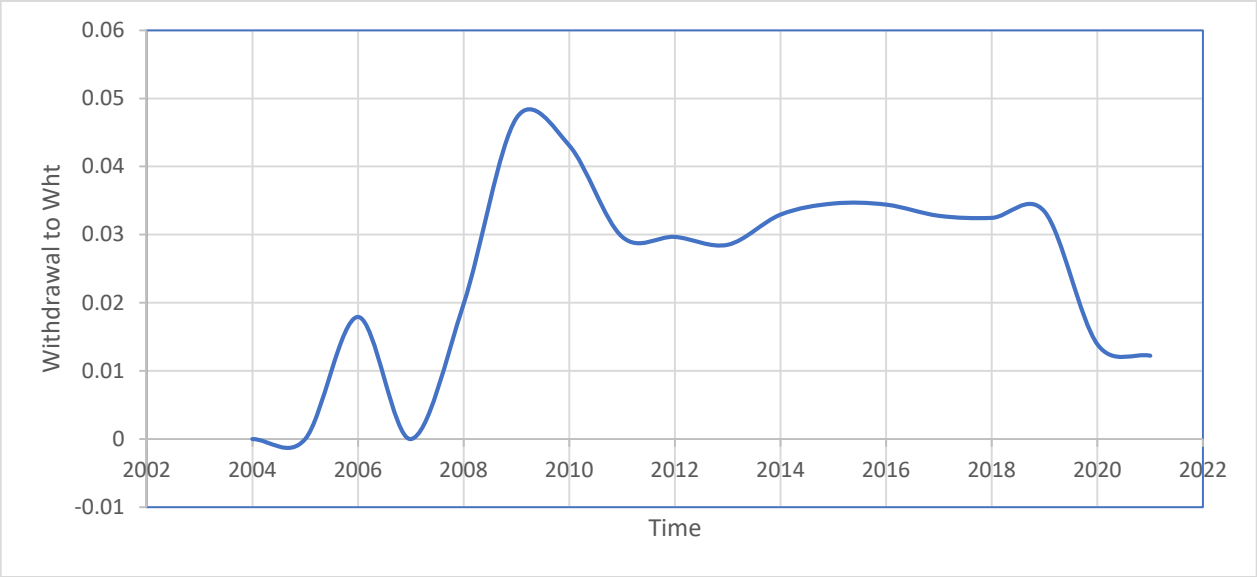


Note: Author Calculations. Monthly data starting from January 2005 to June 2022. Data Source: State Bank of Pakistan Database. The private ratio represents the ratio of private sector deposits to total resident deposits. Time is the time series, which is divided across time.

In parallel to the reduction of private sector deposits, the Federal Board of Revenues (FBR) data evidence a decline in the contribution of withholding tax on cash withdrawals in the total withholding taxes. Figure 2 plots the ratio of withholding tax on cash withdrawal to total withholding tax over time. Figure 2 shows that the contribution of withholding tax in total withholding taxes increased to 4.7 percent in the financial year 2008-09 but decreased since then. This ratio reached 1.2 percent in June 2021.

Figure 2

Ratio of Withholding tax on cash withdrawal to Total Withholding Taxes



Note: Author Calculations. Monthly data starting from January 2005 to June 2022. Data Source: Federal Board of Revenue, Pakistan Year Books. Withdrawal to Wht represents the ratio of Withholding Tax on Cash Withdrawal to Total Withholding Taxes. Time is the time series, which is divided across time.

The SBP annual report 2017 and the evidence derived from the data reveal that the withholding tax on banking transactions has deteriorating effects on financial inclusion. Besides, the data also disclose that this specific tax has not substantially contributed to the tax net. Therefore, the finance department abolished this tax in the financial year 2021-22 (Imran, 2021).

Theoretical studies also suggest that higher taxes reduce savings and deposits. Keynes (1936) provides a theoretical explanation of the relationship between fiscal policy and saving behavior. According to the Keynesian theory, the increase in taxes or implementation of income taxes reduces the effective interest rates. The reduction in interest rates reduce the return on savings. Thus, individuals and corporations prefer consumption over savings and they reduce savings (Jappelli & Pistaferri, 2014; Sandmo, 1985).

The series of government interventions initiating from the fiscal year 2004-05 to fiscal year 2021-22 for boosting both the financial inclusion and income tax net provides an interesting window for analyzing the effect of fiscal policy intervention on financial inclusion. Hence, this study examines the effect of fiscal policy on the financial inclusion of Pakistan. More specifically, this study evaluates the effect of government interventions through withholding tax on banking transactions on the private sector deposit ratio and currency in circulation.

For this purpose, this study evaluates the effects of six interventions on the deposit ratio. These interventions include the increase in withholding tax on cash withdrawals from 0.1 percent to 0.2 percent in the financial year 2005-06, a further increase to 0.3 percent in 2008-09, an increase in the per day cash withdrawal limit from Rs.25,000 to Rs.50,000 in 2012-13, increase in withholding tax on cash withdrawal to 0.6 percent, and implementation of 0.4 percent withholding tax on non-cash banking transactions for non-filers in 2015-16,

abolition of withholding tax on cash withdrawals for filers in 2018-19 and abolition of both withholding taxes in 2021-22.

Among these interventions, 2005-06, 2008-09 and 2015-16 are withholding tax increasing interventions, while 2012-13, 2018-19 and 2021-22 (i.e. hereinafter 2005, 2008, 2012, 2015, 2018 and 2021 respectively) are withholding tax decreasing interventions. This natural classification of interventions provides us with interesting combinations of both withholding tax increasing and decreasing interventions.

We initially employed paired sample t-test for short- and long-term to determine whether the mean values of private sector deposit ratio and currency in circulation significantly changed once the interventions were implemented. The t-test results show that the private sector deposit ratio significantly decreased after implementing all other interventions except the 2012 intervention, where it significantly raised. Similarly, results also evidence the opposite for currency in circulation.

Next, we deployed our results through the autoregressive integrated moving average (ARIMA) modeling technique to estimate our systematic results of the intervention. These results are similar to t-test results and evidence that financial inclusion reduced after 2008, 2015, 2018 and 2021 interventions and increased after 2012. Additionally, results for industry wise classification show that this negative relationship is more prevalent among trade, manufacturing, and agriculture sectors.

This study contributes to three issues in monetary, financial, and fiscal economics. First, this study determines that higher taxes on banking transactions reduce financial inclusion. These results are parallel to Keynes's (1936) theory of saving behavior. According to his proposition, higher taxes reduce the effective tax rate, which ultimately reduces savings.

These results would be of prime importance to the finance division of Pakistan. This tax has recently been abolished by Pakistan. These results would help the government of Pakistan to understand the overall effect of a series of withholding tax interventions on financial inclusion. The country may determine plans of action according to these results.

Additionally, these results are also helpful for other emerging and advanced countries in implementing the banking transaction tax. Argentina has recently introduced this tax while India is also planning to implement a similar type of taxation system. These results would help both countries to reexamine their decision according to the underlying results.

Second, this study evaluates both the short- and long-term effects of withholding tax interventions on financial inclusion and found that these interventions discouraged financial inclusion in both the short- and long-term. Third, this study examined the effect of withholding tax on financial inclusion from the perspective of policy intervention, which helps policy makers in understanding the effect of withholding tax policy on the health of short- and long-term financial inclusion.

2. Methodology

2.1 Variables

The intervention proxy is an indicator variable, which takes the value zero in the time series before the implementation of withholding tax intervention, and one, once the policy intervention is implemented. This study identified six major withholding tax policy interventions, which are tabulated in Table 1. Table 1 shows the distribution of the sample according to the withholding tax interventions. The samples are divided both for short- and long-term. Table 1 explains six policy interventions including July 2005, July 2008, July 2012, July 2015, July

2018, and July 2021. The intervention time series for each sub-sample starts from the implementation of the previous intervention up to the intervention of the next intervention.

Table 1

Definition of Interventions

Intervention Name	Intervention Month	Description of Intervention	Short-term Time Series	Long-term Time Series
2005	July 2005	Implementation of 0.2% withholding tax on cash withdrawals of above Rs.25,000 per day	January 2005 – June 2006	January 2005 – June 2008
2008	July 2008	Increment of withholding tax rate to 0.3%	July 2007 – June 2009	July 2005 – June 2012
2012	July 2012	Increment of cash withdrawal limit to Rs.50,000	July 2011 – June 2013	July 2008 – June 2015
2015	July 2015	Implementation of 0.4% withholding tax on domestic remittances for non-filers Increasing the withholding tax on cash withdrawal rate to 0.6% for non-filers	July 2014 – June 2016	July 2012 – June 2018
2018	July 2018	Abolishing the 0.3% withholding tax on cash withdrawals for filers.	July 2017 – June 2019	July 2015 – June 2021
2021	July 2021	Abolishing the withholding tax on banking transactions	July 2020 – June 2022	July 2018 – June 2022

Data Source: Federal Board of Revenues Annual Books

We hypothesize that July 2005, July 2008, and July 2015 interventions should reduce the private sector deposit ratio and increase the currency in circulation. This is because higher taxation reduces financial inclusion (Chaudhry et al., 2015), and in all these interventions, the finance department increased the withholding taxes. While July 2012, July 2018 and July 2021 interventions should increase the deposit ratio and reduce the currency in circulation because these interventions were implemented to reduce the withholding taxes.

This study includes two most important and relevant variables of financial inclusion including the private sector deposit ratio and currency in circulation (Government of Pakistan, 2017). Table 2 provides the definition and detail of all variables. Deposit ratio and currency in circulation are important financial inclusion variables because while implementing the withholding tax, one of the primary motives of the finance division was to enhance the private sector deposits and to reduce the currency in circulation. Therefore, this study evaluates this contrasting perspective when compared with the theory. Theoretically, higher taxes reduce deposits and increase consumption (Keynes, 1936), while the finance division claims the opposite.

Table 2

Variables

Variables	Construct	Definition	Source
Deposit Ratio	Private Sector Deposits/Total Resident Deposits	It is the ratio of private sector deposits to total resident deposits	(SBP, 2017)
Currency in Circulation	Currency in Circulation/Total Resident Deposits	It is the ratio of currency in circulation to total resident deposits	(SBP, 2017)
Inflation	CPI of the current month – CPI of same month last year	Annual change in the CPI.	(Athukorala & Sen, 2004)
Public Sector Deposits	Public Sector Deposits/ Total Resident Deposits	Sum of public sector organizational deposits	(Athukorala & Sen, 2004)
Deposit Interest Rate	Weighted Average interest rate on deposits	It is the average interest rate paid to depositors on all sort of deposit accounts	(Athukorala & Sen, 2004)
Credit to Private Sector	Log of Credit to the private sector	Variable showing the financial deepening.	(Khan, Gill, & Haneef, 2013)

Gross Domestic Product	Log of Annual GDP uniformly reported during all months of a single year	It represents the macro-economic income level.	(Khan, Gill, & Haneef, 2013)

For determining the control variables of this study, we follow the life cycle theory (Modigliani, 1949, 1954, 1957, 1970) cited in (Modigliani, 1986). According to the life cycle theory, consumption and saving behaviors depend on the life cycle of the individuals. Consumption and savings are functions of current and expected income. An uncertainty or lower than desired future income enhances savings.

Thus, as per the life cycle theory, saving is a function of income. However, this study is unable to find monthly data for macroeconomic income. Therefore, our model considers the annual gross domestic product (GDP). We uniformly divide the annual values across all months of each year. Besides, this study considers inflation, deposit interest rate, public sector savings and credit to the private sector as the control variables of the model (Athukorala & Sen, 2004).

According to Athukorala and Sen (2004), inflation affects private sector deposits because of two reasons. First, inflation leads to uncertainty, therefore, firms and individuals prioritize savings for precautionary purposes. Second, inflation negatively affects the achievement of the target level of wealth. Hence, firms save for maintaining the future level of wealth.

Interest rate is the fundamental factor, which may determine saving behavior. Keynes (1936) explains that higher interest rates motivate firms towards a higher propensity to save. The life cycle approach also considers that higher interest rates encourage firms and individuals to save for the future (Athukorala & Sen, 2004).

Further, Athukorala and Sen (2004) claim that public sector deposits work as a substitute for the private sector deposits in maintaining financial stability. Therefore, public sector deposits also play a vital role in explaining the private sector deposits behavior.

Additionally, this study includes credit to the private sector as the proxy for financial deepening (Khan et al., 2013). Recent studies consider that a higher level of financial development enhances the importance of the financial sector, therefore, the aggregate deposits will also increase (Law & Singh, 2014).

2.2 Data

This study employs monthly time series data for the banking and finance sector of Pakistan from January 2005 to June 2022. The banking data, including the private sector deposits, currency in circulation, credit to private sector and deposit interest rate and macroeconomic data, including inflation are collected from SBP database available in the official web portal of SBP. The intervention data are extracted from FBR year books. While the GDP data are collected from the Federal Bureau of Statistics, Pakistan.

The data for credit to private sector are available since June 2006, therefore, credit to private sector is not included in the analysis of the first intervention (July 2005 intervention). Similarly, the data for deposit interest rates is available since July 2011, therefore, this study deployed the data for Karachi Inter Bank Offer Rate (KIBOR) for the interventions including July 2008 and July 2012. Additionally, the data for KIBOR is available since August 2005, hence deposit interest rate variable is not included in July 2005 intervention.

2.3 Estimation Methods

2.3.1 t-test

To build an initial understanding of whether withholding tax interventions affect financial inclusion, this study performs paired sample t-test (Zheng et al., 2016). In the test, we investigate the difference between the pre-

intervention averages of financial inclusion proxies with the post-intervention averages. A significance of difference represents the effect of the intervention.

This study divides the time series for each intervention into short- and long-term time series. The short-term starts 12 months before the intervention and closes 12 months after the intervention. While, for the long-term, we consider the total time series from the implementation of the previous intervention up to the implementation of the next intervention, taking the underlying intervention somewhere between the time series (For example, for July 2008 intervention, we initiate our long-term time series from July 2005, when the last intervention was implemented to June 2012, the last month of current intervention). We deploy the paired sample t-test on both short- and long-term time series to determine whether average financial inclusion is significantly changed once the intervention is deployed.

2.3.2 ARIMA Modelling

This study deploys the ARIMA model with intervention primarily developed by Box and Tiao (1975). The model takes the following general form:

$$FI_t = f(k, I, x, t) + N_t, \qquad \text{(i)}$$

where *FI* is the time series for financial inclusion, *I* represents the intervention, *x* is the vector of all other exogenous variables, t represents the time, k is a set of unknown parameters and N is the stochastic background noise or variation. This method efficiently deals with autoregression issues by adding the weighted average of all the previous autoregressive components. Additionally, this method includes the weighted average of all the autoregressive errors in the process. The econometric tool also addresses the issue of non-stationery observations by differencing them. This entire process builds it an autoregressive integrated moving average (ARIMA) model (Box & Tiao, 1975; Jarrett & Kyper, 2011). After integrating the ARIMA, the equation (i) takes the following form:

$$FI_t = \alpha_t + V(B)I + N_t, \qquad \textit{(ii)}$$

where α is the intercept of the model, *V(B)* is the vector of autoregressive, integrated, moving average components. This three-step process of selecting the ARIMA model develops it as one of the most sophisticated time series models, since ARIMA is even suitable for autoregressive, non-stationery and data with autocorrelation issue.

Box et al. (2015) identified the procedure for the selection of (p), the number of previous observations to be included in the model. This method is called the autoregressive process (AR). Additionally, the procedure includes the identification of (q), and the number of previous error terms to be included in the model. The moving average method determines the (q). And finally, this procedure identifies the (d), the number of times the observations should be differenced.

The selection of the ARIMA model requires a three-step process identified by Bowerman et al. (2005) cited in (Zheng et al., 2016). The steps include (i) model identification, (ii) parameter estimation and (iii) model validation. In the first step, we determine the order of differencing through the unit root test. We conduct the unit root test through the Augmented Dickey-Fuller test (Jarrett & Kyper, 2011; Yoo, 1998). Additionally, we conduct autocorrelation function test (ACF) to determine the autoregressive order (p) and a partial autocorrelation function (PACF) test for identifying the moving average order (q) (Jarrett & Kyper, 2011).

Once we identify the orders, this study identifies the two most relevant orders of ARIMA (p, d, q). To confirm, which of the order performs better, we estimate the parameters through equation (ii). As parameters are identified, this study evaluates both orders for validating the best model.

For validation, the first step is to measure the significance of the Portmanteau Q-statistic through the estimation of the autocorrelation function (ACF) of residuals. The most significant and order with a lower Q-statistic is considered

better. Additionally, the order with larger numbers of likelihood is prioritized. Further, we determine two more tests including the Akaike criteria and Schwartz criteria. Finally, we select the model, which provides the most efficient results among all the validation tests (Jarrett & Kyper, 2011; Yoo, 1998).

2.3.3 Economic Model

Motivated by the life cycle theory (Modigliani, 1986), this study deploys the economic model of Athukorala and Sen (2004). This study includes the intervention in the given model; hence the model takes the following form:

$$FI_t = \alpha_t + \beta_1 I_t + \beta_2 Inf_t + \beta_3 Credit_t + \beta_4 i_t + \beta_5 Public_t + \beta_6 GDP_t + \varepsilon_t, \qquad \text{(iii)}$$

Where some of the variables are defined in equation (i), α is the model intercept, βs are the coefficients of explanatory variables, *Inf* represents the inflation, *Credit* means the credit to private sector, *i* is the deposit interest rate, *Public* is the public sector deposit ratio, *GDP* is a gross domestic product. We have not included some of the control variables of Athukorala and Sen (2004) because monthly data for these variables are not available for Pakistan. In addition, the model is becoming extremely large and reducing the number of freedoms, thus making it difficult to estimate the proxies.

3. Results and Discussion

3.1 t-test Results

We begin the estimation process by evaluating the effect of fiscal policy intervention on private sector deposit ratio and currency in circulation through the paired sample t-test. In this analysis, we examine whether the mean values of private sector deposit ratio and currency in circulation significantly change once government implement the withholding interventions.

The t-test is applied to both short- and long-term sub-samples of each intervention. Table 3 reports the results. As predicted, results show that the implementation of interventions significantly reduced the private sector deposits and increased the currency in circulation during the short-term as well as during the long-term. As per the results, the interventions significantly reduced the short-term private sector deposits in 2005, 2015 and 2018. In addition, the currency in circulation significantly increased immediately after the implementation of interventions in 2008, 2015 and 2018, though currency in circulation decreased in 2005.

Table 3

T-test of Difference - Variable: Private Sector Deposit Ratio

	Private Sector Deposit Ratio		Currency in Circulation	
Intervention	**Mean Difference**	**Standard Error**	**Mean Difference**	**Standard Error**
2005 Short-term	-0.0226***	0.0024	-0.0158*	0.0075
2005 Long-term	-0.0244***	0.0039	-0.0275***	0.0078
2008 Short-term	-0.0011	0.0026	0.0237***	0.0058
2008 Long-term	-0.0206***	0.0019	0.0152***	0.0033
2012 Short-term	0.005***	0.0014	-0.0028	0.005
2012 Long-term	0.0005	0.0016	-0.0094***	0.0026
2015 Short-term	-0.0183***	0.0018	0.0345***	0.0038
2015 Long-term	-0.0293***	0.0017	0.0428***	0.0027
2018 Short-term	-0.0168***	0.0029	0.0245***	0.0054
2018 Long-term	-0.032***	0.002	0.0530***	0.004
2021 Short-term	-0.0002	0.0021	-0.0102	0.0074
2021 Long-term	0.0009	0.0027	-0.0025	0.0067

Note: ***, ** and * represent statistical significance at the 1%, 5% and 10% level, respectively.

In long-term analysis, results reveal that private sector deposits significantly decreased after the implementation of 2005, 2008, 2015 and 2018 interventions. While currency in circulation significantly increased in 2008, 2015 and

2018. These results show that the initiation of a 0.2 percent withholding tax on cash withdrawals in 2005, the increase in rate of tax to 0.3 percent in 2008, to 0.6 percent in 2015 and the implementation of withholding tax on local remittances in 2015 reduced the financial inclusion, as private sector reduced the deposits. Additionally, currency in circulation raised in response to higher withholding tax interventions.

On the other side, private sector deposit ratio increased and currency in circulation reduced after the implementation of the intervention in 2012. In 2012 intervention, the government increased the minimum withdrawal limit from PKR25,000 to PKR50,000, where firms could withdraw more funds without paying taxes. Technically speaking, 2012 intervention reduced the withholding tax net, therefore, it increased financial inclusion.

These results justify the results of existing studies, which also found that taxes on banking transactions lead to financial exclusion (Cintra, 2009; Fenochietto et al., 2015; Kirilenko and Summers, 2003).

In addition, private sector also reduced the deposits and currency in circulation increased when the withholding tax on cash withdrawals was removed for filers in 2018. These results are in opposition to prior results. The private sector negatively responded to the removal of withholding tax on cash withdrawals. This is in support of the financial inclusion hypothesis that with lower withholding taxes, the private sector would withdraw more money, more funds will be in circulation and deposits will be lower (Government of Pakistan, 2006).
In contrast to other interventions, the 2021 intervention has neither affected the private sector deposit ratio nor the currency in circulation. Additionally, the effect is insignificant both in short- and long-term.

3.2 ARIMA Analysis

3.2.1 Sub-Sample Analysis

The t-test is a simple test, which provides some basic understanding of the economic phenomena. However, it ignores the dynamics of time series. For instance, the t-test ignores the stationery assumption and auto-correlation issue.

For having a systematic understanding of the effect of withholding tax intervention on financial inclusion, this study estimates the results through the autoregressive integrated moving average (ARIMA) technique.

For identifying a robust model, we conducted the Dicky Fuller test to address the issue of non-stationery data. Results reveal that data for most of the variables are non-stationery at level. Therefore, this study considers the first difference of all variables for ARIMA model. This makes the d equal to 1.

Additionally, we conducted a comparative analysis of the two most suitable orders of (p, d, q). Based on the Portmanteau Q-statistic, likelihood ratio, Akaike and Schwartz criteria, we selected the possibly best models for our analysis.

Table 4 provides the results of the ARIMA model for private sector deposit ratio. Table 4 shows the results of the long-term effects of withholding tax interventions from 2005 to 2021. As per the results, the implementation of withholding tax on cash withdrawal in 2005 and its subsequent increase to 0.3 percent in 2008 did not affect the private sector deposit ratio.

Table 4

ARIMA Results - Intervention Analysis - Dependent Variable: Private Sector Deposit Ratio

Variable	2005	2008	2012 (Lag 5)	2015 (Lag 2)	2018	2021 (Lag 5)
Intervention	-0.0017	0.0057	0.0096***	-0.0137***	-0.0061***	-0.0136***
	(0.0212)	(0.0049)	(0.0031)	(0.0041)	(0.0031)	(0.0022)

Inflation	0.0003	-0.0002	0.0005	0.0012***	0.0001	0.0006*
	(0.0007)	(0.0004)	(0.0008)	(0.0004)	(0.0006)	(0.0004)
credit to private sector		-0.0485***	-0.0003	0.0153	0.0148	0.0984***
		(0.0185)	(0.0312)	(0.0203)	(0.0122)	(0.0137)
deposit interest rate		0.0004	-0.0045	0.0003	-0.0047***	-0.0022***
		(0.0011)	(0.0048)	(0.0034)	(0.0009)	(0.0008)
Public Deposit Ratio	-0.3737***	-0.3666***	-0.3656***	-0.7548***	-0.5172***	-0.5920***
	(0.0866)	(0.0744)	(0.1037)	(0.0834)	(0.0746)	(0.0965)
GDP	-0.0259	-0.0429***	-0.0062	-0.0296	-0.0170	0.0240
	(0.0523)	(0.0177)	(0.0230)	(0.0376)	(0.0229)	(0.0196)
Constant	-0.0007	1.7710***	-0.0003	0.0003	-0.0002	-0.0005***
	(0.0005)	(0.1857)	(0.0006)	(0.0004)	(0.0002)	(0.0002)
AR(L)	1	4	3	4	2	2
MA(L)	0	3	2	3	2	2
Difference	1	0	1	1	1	1
Observations	41	73	53	69	71	42

Note: Standard error in parentheses. ***, ** and * represent statistical significance at the 1%, 5% and 10% level, respectively.

However, the increment of the minimum withdrawal limit to PKR50,000 in 2012 significantly increased the private sector deposit ratio (β=0.0096, p<0.01). Though, the 2012 intervention started reducing the private sector deposit ratio 5 months after the implementation of intervention. While the combination of two interventions in 2015 significantly reduced the private sector deposit ratio two months after the intervention day (β=-0.0137, p<0.01). These results justify that higher taxes on banking transactions reduce financial inclusion.

In contrast, the 2018 and 2021 interventions also reduced the private sector deposit ratio (2018, β=-0.0061, p<0.01 and 2021, β=-0.0136, p<0.01). Since these two interventions reduced the withholding taxes on banking transactions, they should have improved the financial inclusion. But negative effects of interventions prove that the reduction of withholding taxes motivated the private sector to withdraw cash from banks without incurring any cost. This ultimately increased the size of cash withdrawals and the reduction in deposits.

For the analysis of currency in circulation, the results are reported in Table 5. Results are mostly like private sector deposit ratio results. Withholding tax intervention increased the currency in circulation in 2008, 2015, 2018 and 2021 (2008, β=0.0204, p<0.01, 2015, β=0.0327, p<0.01, 2018, β=0.0242, p<0.01 and 2021, β=0.0292, p<0.1).

Table 5

ARIMA Results - Intervention Analysis - Dependent Variable: Currency in Circulation

Variable	2005	2008 (Lag 3)	2012	2015	2018	2021 (Lag 9)
Intervention	-0.0083	0.0204***	-0.0010	0.0327***	0.0242***	0.0292*
	(0.0132)	(0.0047)	(0.0044)	(0.0109)	(0.0086)	(0.0176)
Inflation	0.0003	0.0002	-0.0015***	0.0006	-0.0017	0.0008
	(0.0011)	(0.0009)	(0.0006)	(0.0012)	(0.0015)	(0.0022)
credit to private sector	-0.0755		0.1063***	0.0520	-0.1231***	-0.2754**
	(0.0558)		(0.0359)	(0.0707)	(0.0337)	(0.1305)
deposit interest rate	0.0023		-0.0009	-0.0005	0.0048*	-0.0037
	(0.0028)		(0.0055)	(0.0076)	(0.0025)	(0.0042)
Public Deposit Ratio	0.3084	0.0735	0.1112	0.5566**	0.6376**	1.6008***
	(0.2726)	(0.2069)	(0.2297)	(0.2286)	(0.2790)	(0.4406)
GDP	-0.0292	0.0927***	0.1991***	0.0039	-0.0943	0.1369
	(0.0900)	(0.0403)	(0.0413)	(0.0526)	(0.0744)	(0.1119)

Constant	-0.0009	-0.0009	-0.0029***	-0.0006	0.0024***	-0.0008
	(0.0008)	(0.0006)	(0.0006)	(0.0010)	(0.0008)	(0.0009)
AR(L)	4	3	2	3	4	3
MA(L)	1	2	1	2	4	3
Difference	1	1	1	1	1	1
Observations	41	72	53	71	71	38

Note: Standard error in parentheses. ***, ** and * represent statistical significance at the 1%, 5% and 10% level, respectively.

3.2.2 Full Sample Analysis

We now proceed to the analysis of the full sample, where we create six indicator variables. All indicator variables take the value of zero as the sample time series begins. The 2005 intervention becomes one in July 2005, 2008, in July 2008, 2012, in July 2021, 2015, in July 2015 and 2018, in July 2018. All these interventions become zero in July 2021, when the withholding taxes on banking transactions are aborted. While 2021 intervention becomes one in July 2021. We assume that each intervention affects the financial inclusion in combination with the other identified interventions until the withholding tax is seized.

Table 6 reports the results for both the private sector deposit ratio and currency in circulation. Results are mostly identical to the sub-sample results. The private sector deposit ratio significantly reduced after the implementation of 2008, 2015, 2018 and 2021 (2008, β=-0.0045, $p<0.05$, 2015, β=-0.0065, $p<0.01$, 2018, β=-0.0117, $p<0.05$ and 2021, β=-0.0152, $p<0.1$). While currency in circulation increased in 2008, 2015 and 2018 (2008, β=0.0198, $p<0.1$, 2015, β=0.0233, $p<0.01$, 2018, β=0.0271, $p<0.01$). Though, currency in circulation significantly reduced after the implementation of 2005 intervention (β=-0.0584, $p<0.05$). This may be because the implementation of withholding tax restricted the currency in circulation.

Table 6

ARIMA Results - Intervention Analysis with Full Sample

Variable	Private Deposit Ratio	Currency in Circulation
Intervention 2005	-0.0077	-0.0584**
	(0.0153)	(0.0256)
Intervention 2008	-0.0045**	0.0198*
	(0.0021)11	(0.0103)
Intervention 2012	0.0044	-0.0045
	(0.0119)	(0.0119)
Intervention 2015	-0.0065***	0.0233***
	(0.0020)2	(0.0076)
Intervention 2018	-0.0117**	0.0271***
	(0.0053)5	(0.0068)
Intervention 2021	-0.0152*	0.012
	(0.0086)5	(0.0130)
Inflation	0.0002	-0.0001
	(0.0002)	(0.0005)
credit to private sector	-0.0078	0.0353
	(0.0119)	(0.0380)
Public Deposit Ratio	-0.4900***	0.3531***
	(0.0428)	(01351)
GDP	-0.0292**	0.0222
	(0.0115)	(0.0316)
Constant	0.000	-0.0002
	(0.0002)	(0.0004)

AR(L)	3	3
MA(L)	2	3
Difference	1	1
Observations	192	192

Note: Standard error in parentheses. The subscript of standard error shows the number of lags of interventions in the model. ***, ** and * represent statistical significance at the 1%, 5% and 10% level, respectively. Deposit interest rate is not added in the full sample because its values are available since 2011.

3.2.3 Industry Classification

Moving forward, we reexamine the effect of withholding tax intervention on the private sector deposit ratio by classifying each industry of the private sector. The private sector is majorly divided among six broad industries including agriculture, manufacturing, construction, trade, transportation, and real estate.

We report the results in Table 7. Results reveal that the agriculture sector was ignorant of withholding tax interventions during all other interventions except 2012. Wherein 2012, the deposits of the agriculture sector significantly grew three months after the increment of the tax-free cash withdrawal limit. This shows that a decrease in withholding tax increased financial inclusion.

Table 7

Industry Wise Private Sector Deposits Ratio- ARIMA Results - Intervention Analysis

Variable	Agriculture Deposits	Manufacturing Deposits	Construction Deposits	Trade Deposits	Transportation Deposits	Real Estate Deposits
2005	-0.0032	-0.0028	0.0014	0.0001	-0.0111	-0.0052
	(0.0070)	(0.0084)	(0.0030)1	(0.0016)1	(0.0082)	(0.0175)
2008	0.0014	-0.0024**	0.0007	0.0029***	0.0043***	0.0019
	(0.0032)	(0.0010)1	(0.0033)	(0.0004)5	(0.0016)	(0.0087)
2012	0.0010**	0.0018	-0.0009*	0.0001	0.0016	0.0007
	(0.0005)3	(0.0060)	(0.0033)11	(0.0016)	(0.0018)	(0.0041)
2015	-0.0003	0.0017	0.0007*	-0.0014**	0.0052***	0.0011
	(0.0030)	(0.0040)	(0.0004)11	(0.0006)4	(0.0012)	(0.0036)
2018	0.0013	-0.0108***	-0.0019	-0.0010*	-0.0046***	-0.0007
	(0.0016)	(0.0037)5	(0.0032)	(0.0006)	(0.0010)10	(0.0025)
2021	-0.0002	-0.0133***	-0.0011	-0.0001	-0.0002	0.0006
	(0.0049)1	(0.0039)5	(0.0064)	(0.0020)	(0.0079)1	(0.0162)1
Inflation	-0.0001**	0.0001	0.0000	-0.0000	0.0002**	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0002)
credit to private sector	-0.0020	0.0113	0.0057	0.0060	-0.0024	0.0081
	(0.0035)	(0.0100)	(0.0044)	(0.0041)	(0.0074)	(0.0136)
Public Deposit Ratio	-0.0221***	-0.0371	-0.0466***	-0.0667***	-0.0135	-0.0311
	(0.0079)	(0.0372)	(0.0153)	(0.0121)	(0.0199)	(0.0365)
GDP	-0.0040**	0.0019	-0.0084**	-0.0052***	-0.0049	-0.0105**
	(0.0019)	(0.0077)	(0.0034)	(0.0019)	(0.0048)	(0.0046)
Constant	0.0001**	-0.0001	0.0001	-0.0001	0.0001	-0.0001
	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0003)
AR(L)	3	3	3	4	4	4
MA(L)	3	3	1	4	2	3
Difference	1	1	1	1	1	1
Observations	192	192	192	192	192	192

Note: Standard error in parentheses. The subscript of standard error shows the number of lags of interventions in the model. ***, ** and

* represent statistical significance at the 1%, 5% and 10% level, respectively. The deposit interest rate is not added in full sample because its values are available since 2011.

While the manufacturing sector decreased its deposits after withholding tax interventions in 2008, 2018 and 2021 (2008, β=-0.0024, $p<0.05$, 2018, β=-0.0108, $p<0.01$ and 2021, β=-0.0133, $p<0.01$). These results are contrasting, since the 2008 intervention results show that the manufacturing sector decreased their deposits with the increase in withholding tax rate to 0.3 percent. This reflects our hypothesis that higher taxes reduce financial inclusion.

However, the manufacturing sector also reduced deposits when withholding taxes on cash withdrawals were aborted for filers and when withholding taxes on all banking transactions were seized. These results show that the reduction in taxes encouraged the manufacturing sector to convert their deposits into cash in a costless manner.

Additionally, the results of construction sector are opposite to our hypothesis. The results show that the construction sector decreased their deposits when the tax-free withdrawal limit increased in 2012 and increased their deposits with the increase in tax rate and tax net in 2015 (2012, β=-0.0009, $p<0.1$, 2015, β=-0.0007, $p<0.1$). These results go with the claim of Government of Pakistan (2006) that the increase in withholding tax on banking transactions raises the private sector deposits by reducing the velocity of cash withdrawal and funds transfer.

In addition, the trade sector increased its deposits after the 2008 intervention, while they negatively reacted to the 2015 intervention (2008, β=0.0029, $p<0.01$, 2015, β=-0.0014, $p<0.05$). The trade sector reduced the deposits after the 2018 intervention as well.

Moving forward to the transportation sector, this sector positively responded to tax increases in 2008 and 2015 by increasing the deposits after both interventions, while negatively responded to tax cuts in 2018. These results again go with the Government of Pakistan (2006) plans. Finally, the deposits of the real estate sector remained indifferent to all the tax interventions.

4. Conclusion

This study investigates the effect of withholding tax intervention on the financial inclusion of Pakistan. Federal Board of Revenues implemented the withholding taxes on cash withdrawals and non-cash banking transactions to cope with two objectives. The objectives include the increment of the tax net and the increase in financial inclusion. In contrast, we assume that higher withholding taxes on banking transactions discourage deposits from the private sector and therefore, higher withholding taxes should reduce financial inclusion.

This study employed two proxies of financial inclusion including the private sector deposit ratio and currency in circulation to gauge the effectiveness of each of the six withholding tax interventions employed from 2005 to 2021. We employed macro-economic monthly time series data of Pakistan from January 2005 to June 2022. We further estimate our results through the autoregressive integrated moving average (ARIMA) intervention model.

Our results show that financial inclusion was reduced when withholding tax increasing interventions were applied in 2008 and 2015, while financial inclusion increased when withholding tax decreasing intervention was applied in 2012. However, our results also show that the reduction or elimination of withholding tax also reduced financial inclusion. Overall, we conclude that withholding tax interventions in Pakistan either reduced financial inclusion or it was irrelevant to financial inclusion. Though, withholding tax intervention has never improved the financial inclusion.

Consistent with the existing literature on banking transaction tax, this study proves that withholding tax on banking transactions in Pakistan has been a failure. Therefore, this study recommends that countries should not implement

such taxes on banking transactions. Implementation of such taxes does not improve financial inclusion but rather discourages it. Additionally, the reduction of financial inclusion is a threat to the achievement of sustainable development goals.

These results are valuable for finance divisions of countries in general and for Pakistan, Argentina, and India in particular. Our results are important for Pakistan because this study specifically addresses the taxation system and fiscal policy of Pakistan. These results would help the finance division of Pakistan to devise an alternate taxation system, which either may improve financial inclusion or at least should not harm financial inclusion.

These results are important for Argentina and India as well because both countries are going to relaunch a banking transaction tax. Though, both countries implemented the same tax once and aborted it soon. Thus, our findings may help both countries in reevaluating their decision against the re-initiation of this tax.

Further studies in this area may consider a similar framework for multi-country analysis. Additionally, researchers may also investigate the recent banking transaction tax regime of India and Argentina. Further work in this area would be of particular interest to finance divisions of countries, international financial organizations, donor agencies and specifically to the United Nations for implementing the sustainable development goals.

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Acknowledgments

The authors are grateful for comments from two anonymous referees.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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The views and opinions expressed in this paper are those of the authors alone and do not necessarily reflect the views of any institution.

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