

## Tax Planning, Financial Constraints and Investment Management: Empirical Evidence from Pakistan

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### Abstract

The aim of this study is to provide insight into tax avoidance through planning and management, and its investment consequences in financially constrained and unconstrained firms, as well as to empirically examine the interrelationships between the variables studied. Data was extracted from the financial statement analysis of non-financial companies listed on the Pakistan stock exchange (PSX) published by the State Bank of Pakistan, covering ten major manufacturing sectors. KZ index and WW index are used to identify financially constrained and unconstrained firms. Tax avoidance is measured by using GETR and LETR. All the equations are estimated through panel data regression models using common, fixed, and random effects. The empirical investigation of the role of tax avoidance in all firms collectively and constrained and unconstrained firms separately showed that the tax avoidance behavior of these firms is translated into investments by these firms. The study will help policymakers in strategy formulation and implementation related to tax planning and investment decisions in constrained and unconstrained firms to overcome their financial constraints and to optimize their investment decisions for value maximization. This will substantially increase the investment in the country by providing growth opportunities and lowering the tax rates.

**Keywords:** Tax Avoidance, Financial Constraints, Investments, Cash Flows, Pakistan

**JEL Classification Code:** G30, G38, G39

### 1. Introduction

Capital structure choices are considered to be irrelevant for investment purposes in perfect capital markets (Modigliani & Miller, 1958). However, under market imperfections, studies have been significantly showing the relevance of internally generated funds and investment decisions of firms (Stein, 2003). Managers are more

inclined towards internal resources because externally generated funds are more expensive (Fazzari et al., 1988), therefore they generate cash flows from sources other than the company's main operations. One of the techniques used by managers to generate funds internally is by reducing tax liability, which may be termed as tax avoidance here onwards. Tax avoidance explicitly improves the cash flows after tax that may be further used for investment and growth purposes. Thus, tax avoidance measures may have a significant influence on the investment decisions of firms. However, it must be noted that a firm involved in tax avoidance may enhance the moral hazard issues due to the increased information asymmetry between the shareholders and managers. Furthermore, it is necessary to determine and assess whether the links between tax avoidance and investment decisions substantiate business growth or are only an aggravation of overinvestment by management to improve accounting figures.

Since firms possessing positive free cash flows with fewer investment options tend to have more internal resources and are less financially constrained, they are less likely to default as against those firms possessing

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negative free cash flows and lesser internal resources and are more financially constrained. As a result, when it comes to tax avoidance methods, both types of firms act differently. The financially unconstrained firms with more internally available funds generally do not engage in tax avoidance for growth and investment purposes whereas the financially constrained firms with lesser internally available funds are more involved in tax avoidance for their growth and investment purposes.

The study will provide an understanding of tax avoidance consequences in financially constrained and unconstrained firms along with empirically testing the interlinkages between the studied variables. It will help policymakers in strategy formulation and implementation related to tax planning and investment decisions in constrained and unconstrained firms to overcome their financial constraints and to optimize their investment decisions for value maximization. The current research is also useful for the corporate managers of developing countries where the majority of the firms have concentrating ownership in the hands of founding families or institutional investors (Malik et al., 2021; Waheed & Malik, 2019, 2021).

Earlier studies are more focused on measuring and finding determinants of tax avoidance (Waheed & Malik, 2019; Shackelford & Shevlin, 2001) effects of tax avoidance on capital structure decisions (Graham & Tucker, 2006), linkages between tax avoidance and cash holdings (Dhaliwal et al., 2011), tax avoidance and firm value (Koester, 2011), and tax avoidance and investors' reaction (Kim et al., 2010). Yet there is a need to further explore the causes and effects of tax avoidance (Hanlon & Heitzman, 2010). The present study contributes to the existing literature by exploring the linkages between tax avoidance and investment strategies in financially constrained and unconstrained firms, by providing empirical evidence on the observed and hypothesized relationships.

## **2. Literature Review and Hypothesis Development**

### **2.1. Capital Structures and Investments Strategies**

Until recently, researchers all across the world desired to investigate the links between financial constraints and tax avoidance and come up with some generalizable findings. Originating from Keynes (1936) theory of investment that financial and monetary conditions may affect a firm's capital expenditure (investment) to Modigliani and Miller (1958) who observed a positive relation between growth opportunities and debt performance of firms, it has been revealed that firms having growth opportunities

never prefer to finance through external sources. However, Modigliani and Miller (1958) came up with a new idea that under a perfect market, the investment decisions of the firms are independent of the sources of finance, and internal and external sources of finance are perfect substitutes. Brainard and Tobin (1968) concluded that managers never make new investments unless the marginal cost and marginal benefits become equal along with the investment opportunities. Myers and Majluf (1984) discussed that under positive net present value projects, firms are mostly unable to obtain external finance due to capital rationing.

Myers and Majluf (1984) added support to their finding and said that firms facing financial constraints should hold their cash to avoid future investment problems. Myers and Majluf (1984) disagreed with Miller's propositions and came up with evidence that external sources of finance are not perfect substitutes for a firm's internal capital. In addition, Fazzari et al. (1988) supported this concept by empirically proving that internal finances are much cheaper than the external sources of finances. However different studies conducted on the issues such as information asymmetries in capital markets and the effects of capital structure decisions, suggested that financial structures of the firms do have an effect on investment decisions. Titman and Wessels (1988) argued on growth opportunities and found a negative relation between leverage and growth opportunities. According to Kim et al. (1998), capital market imperfections cause a positive relationship between internal sources of finance and investment, and cash holdings are more valuable for firms, so firms hoard more cash when external sources of finance are insufficient to meet their internal capital needs. Stein (2003) mentioned that several theorists posit that under capital market imperfections, firms may be forced to rely on their internal sources of funds for their investments. Almeida et al. (2004) added support to the literature by providing evidence that firms facing problems in raising finance from outside sources save a major portion of their cash flows for future investments. Chen and Zhao (2006) also documented a strong relationship between investment opportunities and internal resources of the firm and indicated managers to rely on cash generated by the firm, and added support to the literature by proving that external sources are always costlier than a firm's own sources.

### **2.2. Financial Constraints**

Financial constraints are those obstacles that prevent the firms from their desired investments. The reason for these obstacles could be credit constraints, equity issuance problems, dependence on financial institutions, or illiquidity of assets (Lamont et al., 2001). Kaplan and

Zingales (1997) developed the KZ index, which uses cash flows, leverage, business size, and age to differentiate between financially constrained and unconstrained firms. Using cash flows, dividend payout, industrial growth, and sales growth, Whited and Wu (2006) created an index to indicate financially constrained enterprises. Both KZ and WW index gave a negative score to cash flows of constrained firms which shows that constrained firms are always concerned about their cash savings through any possible means. These two indicators are widely used by recent researchers to identify and segregate constrained firms and unconstrained firms (Kaplan & Zingales, 1997; Lamont et al., 2001; Livdan et al., 2009; Li, 2011; Whited & Wu, 2006). Faulkender and Wang (2006) observed that financially constrained firms have a stronger relation between cash flows and stock returns. They explained the differential impact of cash holdings in financially constrained firms as against financially unconstrained firms, concluding that financially constrained firms having high investment needs tend to hold more cash as against financially unconstrained firms.

### 2.3. Tax Avoidance

Taxes are one of the major contributors in any economy and firms have always been involved in various forms of tax planning. Hanlon and Hietzman (2010) defined tax avoidance as the reduction of explicit taxes. Chen et al. (2010) defined tax aggressiveness as downward management of taxable income to reduce tax payments to tax authorities. Tax avoidance is a legal measure of reducing taxable income, but tax evasion is not paying all or a part of tax illegally. Representation theory indicates that firms always use incentives to reduce taxes by aggressive tax planning, however, Wang (2010) highlighted that tax avoidance activity may not increase wealth or capital due to costs firms face in tax avoidance activities. Slemrod (2004) developed the idea that shareholders set the level of tax aggressiveness by setting managers' compensation with effective tax rates. Gupta and Newberry (1997) mentioned firm size, industry type, and incentives as a measure for tax avoidance and linked it to GAAP ETR (general accepted accounting principles effective tax rates) while other researchers used rewards, organizational structure, and ownership as a stimulant to tax avoidance. Previous researchers have used GAAP ETR and Long-run ETR in their studies (Dyreng et al., 2008).

Further studies on tax avoidance show how firms save their taxes and what are the reasons for engaging in tax avoidance. Cheng et al. (2012) empirically proved that firms engage in more tax avoidance behavior after their hedge fund transfer. Dyreng et al. (2010) used long-run

cash effective tax rates as a measure of tax avoidance over a period of 10 years. Recently researchers have tested the financial effect of tax avoidance on leverage (Graham & Tucker 2006), cash holding (Dhaliwal et al., 2011), investor return (Hanlon & Slemrod, 2009; Kim et al., 2010), and firm value (Koester, 2011; Wang, 2010). Financially constrained firms more aggressively engage in tax saving behavior than financially unconstrained firms because financial constraint firms have problems in raising external finances, therefore, they use their cash savings from tax avoidance to mitigate their investment problems. Mayberry (2012) in her working paper also explained that firms use their cash savings from tax avoidance to overcome their investment issues.

### 2.4. Hypotheses

The above-discussed literature regarding capital structure, investments, growth, financial constraints, and tax avoidance strategies, fairly allows to develop the under-mentioned hypotheses to be empirically tested and investigated statistically

*H1: Firms with more growth opportunities tend to invest more.*

*H2: Firms with more cash flows tend to invest more.*

*H3: Firms with more tax avoidance practices tend to invest more.*

*H4: Financially constrained firms with more tax avoidance practices tend to invest more.*

*H5: Financially unconstrained firms with more tax avoidance practices tend to invest more.*

## 3. Research Methods

### 3.1. Data Source

Data for different variables used in the study was extracted from financial statement analysis of non-financial companies listed on the Pakistan stock exchange (PSX), published by the State Bank of Pakistan. The report includes 10 major manufacturing sectors namely Textile, Pharmaceutical, Automobile, Tobacco, Chemicals, Oil & Gas, Food, Industrial Metal, Cement, Electrical Machinery, and Paper Products.

### 3.2. Period of Study

The study takes into consideration the year 2011 to 2015 for empirically testing the hypothesized relationships, however, the data for some of the variables used in the study was taken from the year 2007 to observe lead-lag considerations.

### 3.3. Unit of Analysis

Listed manufacturing sector firms were the unit of analysis as per the nature of the study and the requirements of empirical analysis. For measuring the variable of investments, 311 firms were included in the study covering years 2007–2015, thus having 2799 firm-year observations. For the purpose of measuring tax avoidance behavior, only those listed manufacturing companies were filtered and picked which have positive net income throughout the estimation period year 2011–15. The estimation period 2011–15 offers an exciting opportunity in a way that during this period Pakistani firms went through the peak and crust of the economy. For tax avoidance proxies, data of 129 companies was obtained by taking the average of five financial years reducing the data to 645 firm-year observations.

### 3.4. Operationalization of Variables

#### 3.4.1. Investments

For measuring the firm investment the study considered an augmented version of the Fazzari et al. (1988) investment equation.

$$\text{Inv}_{i,t} = \beta_0 + \beta_1 Q_{i,t-1} + \beta_2 \text{CF}_{i,t-1} + \beta_3 \text{AGE}_{i,t} + \beta_4 \text{SIZE}_{i,t-1} + \beta_5 \text{LEV}_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

Where,

$\text{Inv}_{i,t}$  is the net capital expenditure of the firm in year  $t$  scaled by the beginning year total assets of the firm.

$Q_{i,t-1}$  is used as a proxy for the growth opportunity of the firm (given by Tobin'  $Q$ ) and calculated as the market value of the firm scaled by total assets.

$\text{CF}_{i,t-1}$  is calculated as the firm's operating cash flow of the firm in year  $t-1$  scaled by the average total assets of the firm.

$\text{LEV}_{i,t-1}$  is the leverage ratio of the firm calculated as long-term debt over the total assets of the firm.

$\text{SIZE}_{i,t-1}$  is calculated as the natural log of the firm's total assets.

#### 3.4.2. Financially Constrained and Unconstrained Firms

KZ index (Kaplan & Zingales, 1997) and WW index (Whited & Wu, 2006) are used to identify financially constrained and unconstrained firms.

For the KZ index, Growth opportunities and leverage of the firm are given positive weight whereas cash balances, operating cash flows, and dividends are given negative weights. Firms having a higher value of the KZ index are considered financially constrained as the difference between

the internal and external sources of finances for those firms increases. It is calculated as:

$$\begin{aligned} \text{KZ}_{i,t} = & -1.002 (\text{CFO}_{i,t}/\text{TA}_{i,t-1}) - 39.368 (\text{DIV}_{i,t}/\text{TA}_{i,t-1}) \\ & - 1.315 (\text{CSHBAL}_{i,t}/\text{TA}_{i,t-1}) + 3.129 \text{LEV}_{i,t} \\ & + 0.238 Q_{i,t} \end{aligned}$$

Where the  $\text{CFO}_{i,t}/\text{TA}_{i,t-1}$  is the operating cash flow balance of the year scaled by beginning year total assets of the firm,  $\text{DIV}_{i,t}/\text{TA}_{i,t-1}$  is cash dividend paid by the firm scaled by beginning year total assets,  $\text{CSHBAL}_{i,t}/\text{TA}_{i,t-1}$  is the cash balances of the firm over lagged total assets,  $\text{LEV}_{i,t}$  is the ratio of total debt to total assets and  $Q_{i,t}$  is market to book value of the firm given by Tobin'  $Q$  as growth opportunities. WW index is calculated as:

$$\begin{aligned} \text{WW}_{i,t} = & -0.091 \text{CFO}_{i,t}/\text{TA}_{i,t} - 0.062 \text{DIVDUM}_{i,t} + \\ & 0.021 \text{LTD}_{i,t}/\text{TA}_{i,t} - 0.044 \text{LogTA}_{i,t} \\ & + 0.102 \text{INDSG}_{i,t} - 0.035 \text{SG}_{i,t} \end{aligned}$$

Where  $\text{DIVDUM}_{i,t}$  is the dummy variable which is equal to one if the firm pays cash dividend otherwise zero,  $\text{LTD}_{i,t}/\text{TA}_{i,t}$  is the long term debt over lagged total assets,  $\text{INDSG}_{i,t}$  is firm's two-year industrial sales growth and last,  $\text{SG}_{i,t}$  is the sales growth of the firm in year  $t$ .

Both KZ and WW indexes are used to identify the financial constraints of the firm. Earlier literature strongly suggested that the firms with higher values of KZ and WW indexes are considered financially constrained. All the firms were sorted into quintiles based on the calculated indices. Firms lying in the 4<sup>th</sup> and 5<sup>th</sup> quintiles are considered financially constrained and those lying in the 1<sup>st</sup> and 2<sup>nd</sup> are considered unconstrained firms. For heteroscedasticity measurement; Breusch-Pagan/Cook-Weisberg test was used. Winsorized means for variables are used, being a robust estimator in all equations where heteroscedasticity is detected.

#### 3.4.3. Tax Avoidance

Tax avoidance is measured first by using GETR – Generally Accepted Accounting Principles Effective Tax Rate (Dryeng et al., 2008; Mayberry, 2012) and then by using LETR – Long Term Effective Tax Rate (Dryeng et al., 2008).

$$\text{GETR}_{i,t} = \text{TaxExp}_{i,t}/\text{EBT}_{i,t}$$

Where the firm's GAAP effective tax rate is equal to the total tax expenses divided by the firm's earnings before tax.

$$\text{LETR}_{i,t} = \text{Average TaxExp}_{i,t} / \text{Average EBT}_{i,t}$$

The tax avoidance measured as LETR focused on long-run effective tax rates. It is also calculated as GETR but the sum of tax expenses over the five-year period is divided by the sum of earnings before tax over the period of five years.

### 3.4.4. Tax Avoidance and Investment Decisions

The residuals  $\varepsilon_{i,t}$  obtained from the above equation (1) will be used as a proxy for unexplained investment ( $\text{Rinv}_{i,t}$ ) that will be explained by the previous year's tax avoidance in the following equation.

$$\text{Rinv}_{i,t} = \beta_0 + \beta_1 \text{TaxAvoidance}_{i,t-1} + \text{Year}_{i,t} + \text{Industry}_{i,t} + \varepsilon_{i,t} \quad (2)$$

The tax avoidance equation is measured for both the constrained and unconstrained firms and a negative significant coefficient of tax avoidance in the case of constrained firms shows that tax savings are used to overcome investment problems faced by the firms that have limited or expensive access to external financial sources.

All the equations are estimated used common, fixed, and random effect panel data regression models. Sometimes due to large observations packed in a small time period, fixed and random effect models give conflicting results. In such cases, we used the Hausman test under the following hypothesis.

$$H_1 = \text{fixed effects is accepted}$$

$$H_0 = \text{random effects is accepted}$$

**Table 1:** Descriptive Statistics

Variables	Obs	Mean	Std. dev	Min	Max
winv	2798	0.049	0.111	-0.139	0.280
Wcf	2797	0.115	0.095	-0.016	0.287
Wage	2797	31.554	12.807	16.000	53.000
Wsize	2797	14.557	1.383	12.499	16.858
Wlev	2797	0.157	0.139	0.000	0.412
wtq	2797	2.816	1.850	0.373	6.416
wrin	645	0.039	0.024	0.008	0.086
wgetr	644	0.248	0.130	0.044	0.452
wletr	644	0.241	0.097	0.093	0.388
kzdum	645	0.400	0.490	0.000	1.000
wwdum	645	0.419	0.494	0.000	1.000

## 4. Results and Discussion

### 4.1. Descriptive Statistics

The descriptive statistics (Table 1) showed that investment has a mean of 5% while cash flow and leverage have mean values of 11.5% and 15.6% respectively. The mean value of firm age is 31 years, firm size has a mean value of 14.5% and growth opportunities have a mean value of 2.8. It shows that overall firms had growth opportunities while their leverage ratio is more than their internal cash flow. Since this is the long-term debt, Pakistani firms generally use external funds to finance their investment and are supposed to invest less as compared to firms with a lesser leverage ratio. However, the mean value of cash flow is 11.5% that may indicate that Pakistani firms are also using internal cash flows for investment purposes. There are 2798 observations of investment equation and 645 observations of variables used in tax avoidance as firms with negative pretax income were excluded from the study. The mean variables of financial constraints showed that 40% of the firms used in the study are financially constrained when the KZ index is used whereas 42% of the firms are considered financially constrained when the WW index is used as the measure of financial constraints. The measure of tax avoidance variables GETR and LETR have mean values of 24.7 and 24.1 respectively.

### 4.2. Inferential Statistics

The correlation between the variables (Table 2) used in the study indicated that there is no significant correlation among the independent variables thus the estimation is free from multicollinearity.



Investment equation results (Table 3) were obtained using common, fixed, and random effect panel data estimation techniques. The common effect model assigns a positive significant coefficient to Tobin's  $Q$ , cash flow, age, size, and leverage while the fixed effect model assigns a negative significant coefficient to age whereas the random effect model also replicates the same coefficients as in the common effect model. The Hausman test  $p$ -value of ( $0.000 < 0.05$ ) indicates that H1 must be accepted, which is to consider the results of the fixed effect model. As Tobin's  $Q$  (growth opportunities) is assigned a positive significant coefficient ( $t$ -value = 2.5,  $p$ -value =  $0.012 < 0.05$ ), this indicates that growth opportunities have a positive significant impact on investment by the firm.

Our results are consistent with prior studies conducted by Fazzari et al. (1988). Cash flow has a positive significant coefficient  $t$ -value of 16.68 with ( $p$ -value  $0.00 < 0.01$ ) for the investment of the firm. This result is in accordance with

previous studies (Fazzari et al., 1988; Modigliani & Miller, 1958; Lamont et al., 2001; Mayberry, 2012). This shows that Pakistani firms use internal cash to conduct investment activities. The more cash savings from operations, the more the investment will be. The fixed effect model also reveals that leverage has a positive significant coefficient  $t$ -value of 1.86 with ( $p$ -value  $0.062 < 0.1$ ). Since this is the proxy for long-term debt it can be inferred that external finances are also used by Pakistani firms to finance investments. Firm size has a positive significant coefficient of  $t$ -value of 6.06 with ( $p$ -value  $0.00 < 0.01$ ), which shows that size has a positive impact on investment. If the size of the company is large the investment made by the firm will also be large as compared to smaller firms and our results in accordance with the study of Kadapakkam et al. (1998). Last, age has a negative significant coefficient having a  $t$ -value of 3.62 ( $p$ -value  $0.00 < 0.01$ ), which shows that firm age has a negative impact on its investment decisions.

**Table 2:** Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11
winv (1)	1.000										
wcf (2)	0.345	1.000									
wage (3)	-0.022	-0.040	1.000								
wsiz (4)	0.218	0.387	0.150	1.000							
wlev (5)	0.042	-0.119	-0.041	-0.072	1.000						
wtq (6)	0.068	-0.075	-0.125	0.136	0.202	1.000					
wrin (7)	0.018	0.032	0.006	-0.022	0.056	-0.036	1.000				
wget (8)	-0.012	-0.007	-0.020	0.067	0.112	0.180	-0.120	1.000			
wletr (9)	-0.014	-0.035	-0.045	-0.006	0.116	0.153	-0.091	0.722	1.000		
kz Index (10)	0.062	0.016	0.037	-0.024	-0.017	-0.038	0.113	-0.050	-0.076	1.000	
ww Index (11)	0.056	-0.088	-0.066	0.009	0.090	0.037	0.048	0.137	0.150	0.223	1.000

**Table 3:** Investments

Common Effect: Dep. Variable Inv					Fixed Effect: Dep. Variable Inv				Random Effect: Dep. Variable Inv			
winv	Coef.	Std. Err	t-stat	P >  t	Coef.	Std. Err	t-stat	P >  t	Coef.	Std. Err	z-stat	P >  z
wtq	0.003	0.001	2.590	0.010	0.004	0.002	2.500	0.012	0.003	0.001	2.590	0.010
wcf	0.376	0.022	17.300	0.000	0.478	0.029	16.680	0.000	0.376	0.022	17.300	0.000
wage	0.000	0.000	0.600	0.549	-0.004	0.001	-3.620	0.000	0.000	0.000	0.600	0.549
wsiz	0.007	0.002	4.600	0.000	0.040	0.007	6.060	0.000	0.007	0.002	4.600	0.000
wlev	0.083	0.014	5.770	0.000	0.043	0.023	1.860	0.062	0.083	0.014	5.770	0.000
_cons	-0.120	0.021	-5.670	0.000	-0.486	0.083	-5.850	0.000	-0.120	0.021	-5.670	0.000
P-value Hausman Test = 0.000												

This indicates that firms with more age invest less as they are at their stage of maturity and are less concerned about expansion. Hence, they invest less as compared to the newly incorporated firms which are at the growth stage. Our results are consistent with the study of Azam and Shah (2011) conducted on Pakistani firms determining the internal financial constraint and investment.

The results of the common, fixed, and random effect model for the proxies of tax avoidance (Table 4) using GETR and LETR depicted that the tax avoidance proxy of GETR has a negative significant coefficient in the common effect model while it remains the same in the case of fixed and random effect models. The Hausman test shows that the results of the fixed effect model must be accepted. Meanwhile, the tax avoidance proxy LETR has a negative significant coefficient in the case of the common and fixed effect models but an insignificant coefficient in the random effect model. Hence, the Hausman test shows that the results of the random effect model must be accepted. The fixed effect model assigns a negative significant coefficient for GETR which indicates the average tax paid by the firm. This indicates that the lesser tax paid by the firm in the previous year is translated into investment by the firm. However, in the case of LETR, we found a negative but insignificant coefficient that shows that in the long run, the average tax reduction will cause investment to rise in the future.

The result of constrained firm tax avoidance behaviors and its impact on investments (Table 5) were obtained

through all three models using GETR and LETR and it showed that the common and random effect models of constrained firms using the KZ index assign a negative significant co-efficient to GETR while the fixed effect model assigns a negative and insignificant coefficient to LETR. The Hausman test shows that the results of the random effect model must be accepted, which shows that constrained firms save taxes and the tax savings are in turn used for investment.

The same results were obtained again for financially constrained firms based on the WW index (Table 6) which explains the phenomenon that Pakistani firms facing financial distress use the cash saved from tax savings to finance their investment. The results from the study of constrained firm analysis are in line with practices followed by Pakistani firms relying heavily on internal financial resources for their investment activities as already evidenced in Table 3. The cash saved by paying lesser taxes is used to finance positive NPV projects. Our results conform with previous studies (Mayberry, 2012; Myers & Majluf, 1984).

In accordance with the results shown in the above tables, we can say that constrained firms aggressively engage in tax avoidance behaviors. Short-run and long-run tax avoidance practices of financially constrained firms are reflected in our results that financially constrained firms mainly focus on tax savings to save cash and use cash savings for their future investment projects. KZ index supported the negative significant relationship between tax avoidance and investments while using GETR in financially unconstrained

**Table 4:** Tax Avoidance and Investment (All Firms)

Tax Avoidance: Using GETR					Tax Avoidance: Using LETR				
<b>Common Effect Model: Dependent Variable Re-Investment</b>									
wrinv	Coef.	Std. Err	t-stat	P >  t	wrinv	Coef.	Std. Err	t-stat	P >  t
wgetr_1	-0.028	0.011	-2.620	0.009	wletr_1	-0.007	0.013	-0.540	0.591
_cons	0.044	0.006	7.880	0.000	_cons	0.039	0.006	6.910	0.000
<b>Fixed Effect Model: Dependent Variable Re-Investment</b>									
wrinv	Coef.	Std. Err	t-stat	P >  t	wrinv	Coef.	Std. Err	t-stat	P >  t
wgetr_1	-0.044	0.017	-2.540	0.012	wletr_1	-0.061	0.041	-1.490	0.136
_cons	0.053	0.005	10.500	0.000	_cons	0.057	0.010	5.520	0.000
<b>Random Effect Model: Dependent Variable Re-Investment</b>									
wrinv	Coef.	Std. Err	z-stat	P >  z	wrinv	Coef.	Std. Err	z-stat	P >  z
wgetr_1	-0.030	0.011	-2.680	0.007	wletr_1	-0.009	0.014	-0.620	0.535
_cons	0.040	0.006	6.730	0.000	_cons	0.036	0.006	5.760	0.000
p-value Hausman Test = 0.2875					p-value Hausman Test = 0.1526				

**Table 5:** Tax Avoidance & Investment (Financially Constrained Firms – Using KZ Index)

Tax Avoidance: Using GETR					Tax Avoidance: Using LETR				
<b>Common Effect Model: Dependent Variable Re-Investment</b>									
wrinv	Coef.	Std. Err	t-stat	P >  t	wrinv	Coef.	Std. Err	t-stat	P >  t
wgetr_1	-0.025	0.014	-1.81	0.073	wletr_1	-0.022	0.011	-1.96	0.052
_cons	0.033	0.009	3.73	0	_cons	0.031	0.008	3.66	0
<b>Fixed Effect Model: Dependent Variable Re-Investment</b>									
wrinv	Coef.	Std. Err	t-stat	P >  t	wrinv	Coef.	Std. Err	t-stat	P >  t
wgetr_1	-0.078	0.0294	-2.66	0.009	wletr_1	-0.029	0.024	-1.23	0.221
_cons	0.0571	0.0077	7.43	0	_cons	0.054	0.008	7.13	0
<b>Random Effect Model: Dependent Variable Re-Investment</b>									
wrinv	Coef.	Std. Err	z-stat	P >  z	wrinv	Coef.	Std. Err	z-stat	P >  z
wgetr_1	-0.036	0.0156	-2.32	0.021	wletr_1	-0.021	0.0118	-1.77	0.076
_cons	0.046	0.0044	10.42	0	_cons	0.051	0.0046	11.11	0
p-value Hausman Test = 0.090					p-value Hausman Test = 0.686				

**Table 6:** Tax Avoidance & Investment (Financially Constrained Firms – Using WW Index)

<b>Common Effect Model: Dependent Variable Re-Investment</b>									
wrinv	Coef.	Std. Err	t-stat	P >  t	wrinv	Coef.	Std. Err	t-stat	P >  t
wgetr_1	-0.026	0.014	-1.910	0.059	wletr_1	-0.142	0.083	-1.720	0.088
_cons	0.049	0.018	2.760	0.007	_cons	0.072	0.020	3.630	0.000
<b>Fixed Effect Model: Dependent Variable Re-Investment</b>									
wrinv	Coef.	Std. Err	t-stat	P >  t	wrinv	Coef.	Std. Err	t-stat	P >  t
wgetr_1	-0.034	0.024	-1.450	0.153	wletr_1	-0.049	0.050	-0.980	0.328
_cons	0.056	0.009	6.550	0.000	_cons	0.061	0.016	3.820	0.000
<b>Random Effect Model: Dependent Variable Re-Investment</b>									
wrinv	Coef.	Std. Err	z-stat	P >  z	wrinv	Coef.	Std. Err	z-stat	P >  z
wgetr_1	-0.027	0.014	-1.900	0.058	wletr_1	-0.120	0.083	-1.740	0.052
_cons	0.049	0.019	2.600	0.009	_cons	0.070	0.020	3.500	0.001
p-value Hausman Test = 0.6762					p-value Hausman Test = 0.8297				

firms. However, an insignificant negative relationship was observed between the studied variables using LETR in financially unconstrained firms (Table 7).

WW index also supported the same proposition as explained by the KZ index, depicting the negative significant relationship between tax avoidance and investments while

using GETR in financially unconstrained firms. However, an insignificant negative relationship was observed between the studied variables using LETR in financially unconstrained firms (Table 8).

In accordance with the results shown in the above tables, we can say that constrained firms aggressively engage in tax



**Table 7:** Tax Avoidance & Investment (Financially Unconstrained Firms Using KZ-Index)

Common Effect Model: Dependent Variable Re-Investment									
wrinv	Coef.	Std. Err	t-stat	P >  t	wrinv	Coef.	Std. Err	t-stat	P >  t
wgetr_1	-0.029	0.017	-1.740	0.083	wletr_1	-0.071	0.056	-1.250	0.212
_cons	0.044	0.008	5.770	0.000	_cons	0.055	0.014	3.870	0.000
Fixed Effect Model: Dependent Variable Re-Investment									
wrinv	Coef.	Std. Err	t-stat	P >  t	wrinv	Coef.	Std. Err	t-stat	P >  t
wgetr_1	-0.077	0.030	-2.600	0.010	wletr_1	-0.083	0.058	-1.430	0.154
_cons	0.057	0.008	7.200	0.000	_cons	0.059	0.015	3.910	0.000
Random Effect Model: Dependent Variable Re-Investment									
wrinv	Coef.	Std. Err	z-stat	P >  z	wrinv	Coef.	Std. Err	z-stat	P >  z
wgetr_1	-0.043	0.018	-2.400	0.016	wletr_1	-0.004	0.025	-0.180	0.860
_cons	0.048	0.009	5.420	0.000	_cons	0.041	0.010	3.980	0.000
p-value Hausman Test = 0.090					p-value Hausman Test = 0.177				

**Table 8:** Tax Avoidance & Investment (Financially Unconstrained Firms Using WW-Index)

Common Effect Model: Dependent Variable Re-Investment									
wrinv	Coef.	Std. Err	t-stat	P >  t	wrinv	Coef.	Std. Err	t-stat	P >  t
wgetr_1	-0.044	0.019	-2.360	0.019	wletr_1	-0.142	0.083	-1.720	0.088
_cons	0.047	0.007	6.830	0.000	_cons	0.072	0.020	3.630	0.000
Fixed Effect Model: Dependent Variable Re-Investment									
wrinv	Coef.	Std. Err	t-stat	P >  t	wrinv	Coef.	Std. Err	z-stat	P >  z
wgetr_1	-0.054	0.030	-1.780	0.078	wletr_1	-0.007	0.023	-0.330	0.744
_cons	0.055	0.008	6.900	0.000	_cons	0.040	0.006	6.910	0.000
Random Effect Model: Dependent Variable Re-Investment									
wrinv	Coef.	Std. Err	z-stat	P >  z	wrinv	Coef.	Std. Err	t-stat	P >  t
wgetr_1	-0.046	0.020	-2.330	0.020	wletr_1	-0.120	0.083	-1.440	0.052
_cons	0.049	0.008	6.300	0.000	_cons	0.070	0.020	3.500	0.001
p-value Hausman test = 0.705					p-value Hausman test = 0.090				

avoidance behaviors. Short-run and long-run tax avoidance practices of financially constrained firms are reflected in our results that financially constrained firms mainly focus on tax savings to save cash and use cash savings for their future investment projects. Financially unconstrained firms are found to be involved in tax avoidance activities in the short run but not in long run. This is because financially unconstrained firms tend to have more convenient access

to external sources of finance so they are lesser concerned about cash savings through tax avoidance in the long run.

## 5. Conclusion

The study aimed to explore the role of tax avoidance and its linkages with investment decisions of the Pakistani manufacturing sector. The study observed that Pakistani

manufacturing firms rely heavily on their internal sources of finance like cash saving to finance their positive NPV projects and also rely on leverage to finance their positive NPV projects. The empirical investigation of the role of tax avoidance in all firms collectively and constrained and unconstrained firms separately showed that the tax avoidance behavior of these firms is translated into the investments by these firms. The findings suggest that policymakers look into these implications to substantially increase the investment in the country by providing growth opportunities and lowering the tax rates. Moreover, the study explains the manufacturing firm's behavior regarding tax aggressiveness and somehow justifies how this behavior may ultimately lead to the growth of the firms providing those firms with higher margins in the future, and in turn, paying more taxes to the national exchequer, thus contributing to the economic growth significantly.

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