TAX STRUCTURE AND ECONOMIC GROWTH IN PAKISTAN

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Abstract

The issue of economic growth and prosperity has been the subject of heated debate around the world for decades. Technology, investment (in both human and physical capital), and innovative manufacturing techniques are without a doubt the growth fundamentals. Taxation has a significant impact on investment and production of corporate sectors, which influences the decisions on the rate of development and growth in corporate sectors and which ultimately effect the economic growth. The global rate of taxation has declined steadily during the previous decades in almost every country. But in Pakistan it is still higher compare to its neighboring countries. This research intends to investigate the effects of corporate tax rate and effective sales tax rate on corporate sector's production and their corresponding impact on economic growth. This study has used secondary data, and applied two different regression to find out the effect of tax structure on economic growth, In the first regression model we estimate the effect of effective sales tax rate on four corporate sectors' production (Cement, textile, Cigarettes and natural gas) and in the second regression model we analyzed the effect of estimated corporate sector's production on economic growth for the time period of 2000 to 2019, in the direct strategy we have used the ARDL technique to analysis the effect of corporate tax rate on economic growth for the time period of 1980 to 2020. The finding of the research suggests that tax structure has negative and statically significant impact on economic growth. The study concludes that by lowering the corporate tax and sales tax rate can increase the production of corporate sector, which will ultimately boast in the economic growth. Therefore to fuel the progress and development in economic growth, well-structured policy framework regarding tax structure is crucial.

Keywords: *Economic Growth, Tax Structure, Effective Sales Tax Rate, Corporate Tax Rate, Corporate Sector and Production.*

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List of Abbreviation

ADF	Augmented Dickey Fuller
AIDP	Automotive Industry Development Program
ARDL	Auto Regressive Distributive Lag
CKD	Completely Knocked Down
CTR	Corporate Tax Rate
CS	Corporate Sectors
CPI	Consumer Price Index
ECM	Error Correction Model
ETR	Effective Sales Tax Rate
FBR	Federal Board of Revenue
ILO	International Labor Organization
IMF	International Monetary Fund
LCVs	Light Commercial Vehicles
LSM	Large Scale Manufacturing
MOIP	Ministry of Industries and Production
NPM	Net Profit Margins
PBS	Pakistan bureau of Statistic
R&D	Research and Development
SBP	State Bank of Pakistan
SME	Small Medium Enterprises

SSM	Small Scale Manufacturing
WTO	World Trade Organization
WDI	World Development Indicators
UNDP	United Nations Development Program
UNIDO	United Nations Industrial Development Organization

CHAPTER 1

INTRODUCTION

1.1 Introduction

Taxation is largely used to fund government expenses. Taxation is also used to achieve other goals, such as equality, and to address social and economic issues. The rates must be put up to reduce taxpayer compliance costs and government administrative costs while discouraging tax evasion and avoidance. Taxes, on the other side, have had an effect on individual's decisions to consume, save, provide services, and spend in development of human resources, and as well as firm decision to supply, create jobs, innovate, and invest, including investor's decision of saving or invest on financial assets (Padda and Akram 2010). There has been a tremendous amount of study in fiscal policy over the last several decades demonstrating the various methods in which taxations distort enterprises' and individuals' distribution choices and effect of taxation on the whole economic development (Padda and Akram 2010).

The primary goal of a good tax structure is to adequately fund public goods and services, minimize income inequality, and endorse resource efficiency and economic stability(Musgrave and Finance 2008). In this study we have considered tax rates under tax structure discussion. The corporate income tax rate is the percentage of a company or person's income that is taxed underneath a taxation system (usually expressed as a proportion). There are many methods to

portray a tax rate: Statutory, Marginal, Average, and effective. There are two kinds of tax base definitions: inclusive and exclusive[1], which may be used to calculate these rates.

The tax-structure and growth nexus has long been a source of debate among policymakers and economists. Numerous empirical and theoretical researches have attempted to explore this topic (Solow 1970; Romer 1990; Schumpeter 2010; Lodhi, 2017). There appears to be a direct link between tax structure and economic growth because firms' performance is the important source for the economic growth (Schumpeter 2010) and hence the corporate tax rate and effective sales tax rate is also an important source for the economic growth. This is so because corporate tax rates and effective sales tax rate have direct impact on the firm's compatibility, sales, and growth. Therefore, any adverse effect in firm's production would translate in to poor economic growth.

According to the exogenous[2] and endogenous growth[3] theories different tax structure has significant effects on economic growth (Solow 1970). Especially endogenous theorists consider that changing the tax rate can boost economic activity in the long run (Romer 1990). According to endogenous growth theory, level of taxes and tax composition both are crucial in order to achieve long-run economic growth. In endogenous growth theory, there are two instruments of taxes: distortionary taxes, which prevent the accumulation of physical and human capital whereas, non-distortionary taxes, have no effect over accumulation of capital (Benos 2009). Corporate tax rate discourage capital accumulation and decrease the economic growth whereas

[1]Tax Inclusive refers to the tax amount that is included in the price of purchase.

[2] The exogenous growth theory is a theory of neoclassical economics that asserts that outside exogenous factors are more critical in determining the success of an economy, industry, or individual business.

[3] The endogenous growth theory is an economic theory which argues that economic growth is generated from within a system as a direct result of internal processes.

indirect tax such as effective sales tax rate have a long-term impact on consumer choices. (Harberger 1964) showed that changing the tax structure has insignificant effect on economic growth.

Many tax structure research articles (Munir and sultan 2018; Saqib, Ali et all 2014; Ahmad, Sail et al 2018; Lodhi, 2017) already have concluded that in Pakistan tax policies, are growth retarding. The complexities of the tax structure and the essence of taxation in Pakistan are the key obstacles to develop a business-friendly environment. Improper, retrogressive, rigorous, and unfair taxation structures with an exceedingly narrow tax base are the main underlying factors for the lower tax-GDP ratio (Hussain.S, 2001). Pakistan does not have a competent state that will use the increased revenues wisely. Some, including Haque (2017 and 2020), argue that the state is wasteful and incompetent. The state keeps wasting resources on poorly thought projects, building official housing and other low return or negative return projects (Haque et al. 2020). A major problem for investors has been the lack of consistency, continuity, clarification, accountability and business-unfriendly tax policy (Lodhi 2017). Historically, the primary reason for the government to impose taxes has been to raise tax revenues for the mobilization of resources for government spending. However for the last five years, the tax to GDP ratio has hovered between 10.7 percent to 10.9 percent, which is one of the lowest in the region when compared with neighboring countries such as Nepal, India, Sri Lanka and Bangladesh (Revenue, 2021). It is noticeable here that the national tax number (NTN) holders in Pakistan are only 7.4 million out of a population of 220 million and only 3 million so far filed returns during 2021 (Revnue, 2021). This shows that in Pakistan, tax structures have simultaneously been quite ineffective and controversial creating complexities in our taxation policies.

Pakistan's national assembly debated the federal budget for fiscal year 2021-22 on June 11th 2021. The budget contains tax policies and other provisions targeted at enhancing long-term economic growth. The reduction in capital gain tax from 15% to 12.5 percent provided significant relief to the corporate sector in the budget. A number of withholding taxes were also eliminated in the budget. The budgeted amount for business subsidies has been set at PKR 682 billion (USD 4.3 billion). Tax assistance for women entrepreneurs is also included in the budget. In the budget, the finance minister stated that no new taxes will be placed on the salaried class. He went on to say that the yearly turnover tax ceiling has been raised from PKR 10 million to PKR 100 million to help small enterprises (approximately USD 63,000 to USD 630,000) (Shabbir, 2021).

According to present literature there are several studies which show the relation among direct as well as indirect tax on economic growth. However in the context of Pakistan there is no such particular study has been carried out to demonstrate the effect of tax rate change on the different corporate sector and their corresponding impact on overall economic growth. So this thesis will be helpful to have an estimate the effect of corporate tax rates and effective Sale tax rate on different corporate sector and corresponding impact on overall economic growth in Pakistan.

1.2 Research Question

The study will have the following questions

- What is the effect of corporate tax rate on economic growth in Pakistan?

- What is the effect of effective sales tax rate on different corporate sectors of Pakistan economy such as cement, textile[4], cigarettes and natural gas sector?

1.3 Objectives of the study

The Objectives of the study are:

- To understand the effect of effective sales tax rate [5]on different corporate sector (Cement, Textile, Cigarettes[6] and Natural gas) outcome and their corresponding impact on overall economic growth.
- To understand the effect of corporate tax rate on economic growth in Pakistan.
- Identify the optimal tax rates.

1.4 Significance of the study

Finding of the research will be helpful to estimate the effect of corporate tax rate and effective sales tax rate of different corporate sector and their corresponding effect on overall economic development in Pakistan and will help to propose an optimal tax structure which will help the policy maker to formulate a better tax policy for economic growth.

[4] Textile sector includes only Cotton yarn, Cotton fabric and Jute's production.
[5] Sales Tax is a tax levied by the Federal Government under the Sales Tax Act, 1990, on sale and supply of goods and on the goods imported into Pakistan. Sales Tax on services is levied by the Federal Government under The Islamabad Capital Territory (Tax on Services) Ordinance, 2001
[6] In the study the Tobacco sector is not fully represented, since we have only Cigarette production data available therefore, we have opted the Cigarette commodity only.

1.5 Organization of the study

After the introduction chapter 1, chapter 2 gives overview of the literature and chapter 3 will discuss the theoretical background; chapter 4 gives details about methodology and data for effect of effective sales tax rate on corporate sector and their corresponding impact on economic growth in Pakistan. Chapter 5 will discuss the results and discussion. In the chapter 6 we will discuss methodology and result for corporate tax rate effects on economic growth. In chapter 7 Qualitative Analysis is discussed. And finally in the chapter 8 the conclusion and policy recommendation is given.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This Chapter reviews the literature related to the effect of tax structure on different corporate sectors and their corresponding impact on overall economic growth in Pakistan. So, this chapter will explain very briefly the factors reconnoiter by different studies on tax structure. The literature reviews help us to identify the research gap and explain in brief the objectives of the study discussed in previous studies.

2.2 Tax Policy Effects on Economic Growth

In past few years, the Pakistani system of taxing businesses has experienced significant modifications. However, the corporation tax system continues to be burdened by plenty of issues, including those relating to the system's neutrality, yield, and simplicity. The tax base has reduced over time as a result of tax avoidance and evasion, reducing revenues and eliminating many taxpayers from the tax net (Haider, 2013). The situation in Pakistan with regard to tax collection is going to worsen. The Federal Board of Revenue is responsible of tax collection in Pakistan, though its transparency has been questioned. Taxation is viewed as a financial stress by both the well off and the poor. Pakistan's government has been unable to encapsulate the elite class, whereas, middle class or lower class is pressurized to pay taxes. There are two main types of taxes: indirect and direct taxes. Direct taxes are gathered from properties, income and profit earned from corporate sector while indirect tax is attained from sales tax and value-added import tax (Haider, 2013).

Many economists acknowledge that there is a negative relationship between taxes and economic growth. As tax discourages work efforts, also people who pay more tax tries to move to the other country having low tax rate. On the other hand Investors decision regarding investment in country with high tax rates is highly correlated with taxes. In short, tax rate is important ingredient of economic growth. Each country collects revenue in their own way. Some collects revenue through increase in taxation. Economic growth is always negatively affected by tax rates (Engen and Skinner 1996). The primary thoughts on endogenous growth theory were expressed by (Solow 1970). In the exogenous model, tax policies have a short-term impact on growth. (Barro 1990) was the first to explore the link between taxes and economic development (1990) by using two sectors model. He presented that in the long-run, consumer tax, corporate tax and labor tax negatively impact growth.

Moreover (Dowrick 1995) also found negative relation between tax and economic growth. Due to increase in tax revenues, there exists inverse relation between government expenditures and taxes while lower tax rates boost economic growth (Margareta and Constantin 2015). The influence of taxes on economic growth and wealth distribution is a controversial area of discussion. Clark (2008) stated that progressive taxation helps to enhance income equality by promoting an equitable allocation of income. Barry (2015) used regression analysis to look at the relationship between tax policy and economic development from 1964 to 2004. The author used an endogenous growth framework and discovered a negative link between taxation and economic growth. Taxes are crucial to the country's economic development and progress. Therefore tax policy component must be included in every country's economic goals. Higher taxes are a deterrent to investment.

If the tax rate is lower, people and organizations will focus on research and development, and vice versa. Taxes deter people from working, resulting in lower labor participation and, as a result, lower economic growth. Because investors would relocate their investments to industries with lower tax rates, tax policies can affect capital's marginal productivity (Masood, 2010). Although in many developed countries despite having high tax rates, they are able to fetch high Investment because the tax rate is not only the determinate which effects the investment. Key determinate for the investment are level of economic activity, the capacity utilization rate, cost of capital goods, stock of capital, technology change and fiscal policy. As Lodhi (2017) stated that in the developing countries lower tax rates have generally positive impact on investment. Therefore in the developing countries tax rates have greater impact on investment's determinates than developed countries. Abdioglu et al. (2016) explained the relationship between corporate income taxes and investment level in OECD countries and concluded that there is significant increase in the Investment level due to low tax rate in the region. Furthermore Ahmed et al. (2010) run a micro-simulation analysis for tax reform in the country and conclude that almost simulations of increasing the tax rate in the country result in a decrease in investment levels, reduced consumption, and an increase in poverty.

Ogbonna (2011) investigates the impact of Nigeria's tax change on economic development. The author's analysis is based on secondary data from 1994 to 2009. Tax reforms have a positive and substantial relationship with economic development, as per the Johansen and Granger Causality Test. Santiago (2012) claims that there is a negative relationship between tax and economic growth, a tax system presents an opportunity as a key factor in the economy. The taxation system in Pakistan comprises taxes on a variety of income sources, consumption, wealth, profits, and capital gains. Customs duties, excise duties, levies, and surcharges are also used to generate

revenue. The most of revenue is generated from federal taxes, which account for around 92 percent of overall revenue collections. The sales tax is the most important federal tax, accounting for 36% of overall tax receipts whereas; income tax generates 33% of the revenue. In 2015-16, excise and custom duty contributed 5% and 11%. Provincial tax stuck at 7%.

Table 2.1: Relation between Taxes and Economic growth

No.	Research Paper	Year	Negative	Positive
1	**Abdioglu et al.**	OECD, 2016	Negative	-
2	**Ahmad et al.**	2018	Negative	-
3	**Ahmed et al.**	2010	Negative	-
4	**Anastassiou & Dritsaki**	JJSS, 2005	Negative	-
5	**Atif et al.**	2013	Negative	-
6	**Azeem et al.**	2013	Negative	-
7	**Babatunde**	AESS, 2016	Negative	-
8	**Barry and Jules**	2008	Negative	-
9	**Branson & Lovell**	Springer, 2000	-	Positive
10	**Dackehag & Hanson**	OECD,2015	Negative	-
11	**Djankov et. Al**	NBER, 2011	Negative	-
12	**Edame and Okoi**	2014	Negative	-
13	**Ferede & Dahlby**	National Tax Journal, 2012	Negative	-
14	**Gbewopo Attila**	SSRN, 2008	Negative	-
15	**Gustavo et. al**	AIDB, 2013	Negative	-
16	**Hakim et al.**	JBRMR, 2016	Negative	-
17	**Holocombe & Lacombe**	Public Finance review, 2004	Negative	-
18	**Islahi**	Mad.Confernce 2006	Negative	-

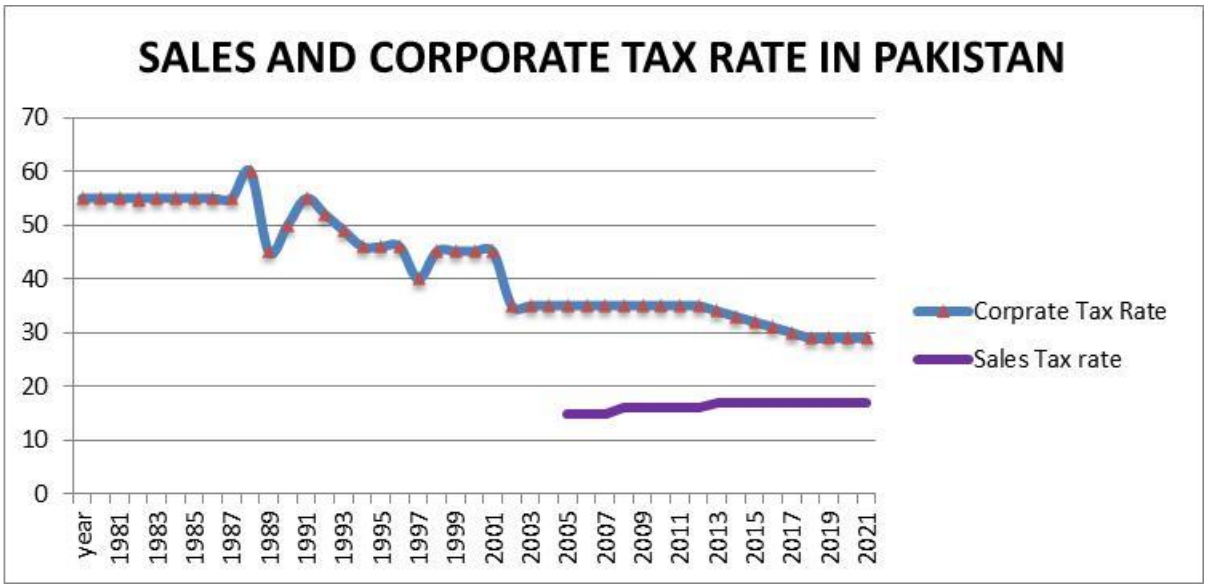
19	**Johansson et. Al**	**OECD,2008**	Negative	-
20	**Kopczewska et al**	Springer, 2015	Negative	-
21	**Lee & Gorden**	Elsevire, 2005	Negative	-
22	**Madni**	2014	Negative	-
23	**Martin Feldstein**	NBER, 2006	Negative	-
24	**Rudolf Macek**	OECD, 2015	Negative	-
25	**Saqib et al.**	2014	Negative	-
26	**Siddiqui**	2010	Negative	-
27	**Yahya**	JREIF, 2013	Negative	-

Table2.1: In the light of Different studies in the literature review concludes that taxation has adverse effect on economic growth.

2.3 Corporate and Sales Tax Rate Trend in Pakistan

In past few years, the Pakistani system of taxing businesses has experienced significant modifications. We have witnessed a significant decline in the corporate tax rate and sales tax rate in Pakistan.

Fig 2.1: **Comparison of Corporate Tax rate**



Source: Organization of Economic Corporation and Development (OECD)

Fig: 2: The above Chart presents the corporate tax rate and sales tax rate trend in Pakistan. Since 1980-2021 corporate tax rate and sales tax rate in Pakistan depict the decline trend.

2.4 Comparison of Corporate Tax Rate between Pakistan and the Rest of the World

Africa has the highest corporate tax rate as compared to any other country, whereas, with a corporate tax rate of 19.62 percent, Asia has the lowest corporate tax rate of any country. South America has the highest overall corporation tax rate, at 31.03 percent, as measured by GDP. At 23.97 percent, Europe's weighted average corporate income tax is the minimum in history.

In 1980, global corporate tax rates averaged 40.11 percent and 46.52 percent when GDP was factored in. Since then, countries have realized the impact of high corporation tax rates on business investment decisions. In 2021, the average tax rate for 180 various tax jurisdictions is 23.54 percent, and 25.44 percent when aggregated by GDP. Every major state in the world, including the world's most powerful economy, has witnessed declines. There are just a few tax countries with statutory corporate income tax rates higher than 35%. About 115 countries [7]impose a tax of at least 20% but not more than 30%, Pakistan is also included in these countries. Just Twenty-two countries [8]have a statutory corporation tax rate of at least 30% but not more than 35%. Just three countries have rates higher than 35%, a statutory corporation tax rate lesser than 20% is found in 85 countries, while a corporate tax rate of less than 30% is found in 200 countries.

Stronger and more advanced economies, on average, have higher corporate income tax rates than weaker countries. Generally, corporation tax rates have steadily decreased over the last 40 years. The unweighted average global statutory tax rate in 1980 was 40.11 percent. Today, the average statutory rate is 23.54 percent, a drop of 41 percent during the 41 years analyzed. During this time, the weighted average statutory rate has held higher than the simple average.

[7] https://taxfoundation.org/publications/corporate-tax-rates-around-the-world/

[8] High corporate income rate Countries (Comoros, Suriname, Argentina, Chad, Cuba, Equatorial Guinea, Guinea, Malta, Saint Martin (French Part), Sint Maarten (Dutch part),Puerto Rico, Sudan, Zambia, American Samoa, Brazil, Venezuela, Cameroon, Saint Kitts and Nevis, Seychelles, Bangladesh).

Table 2.1: Cross Countries Comparison (Corporate Tax Rate)

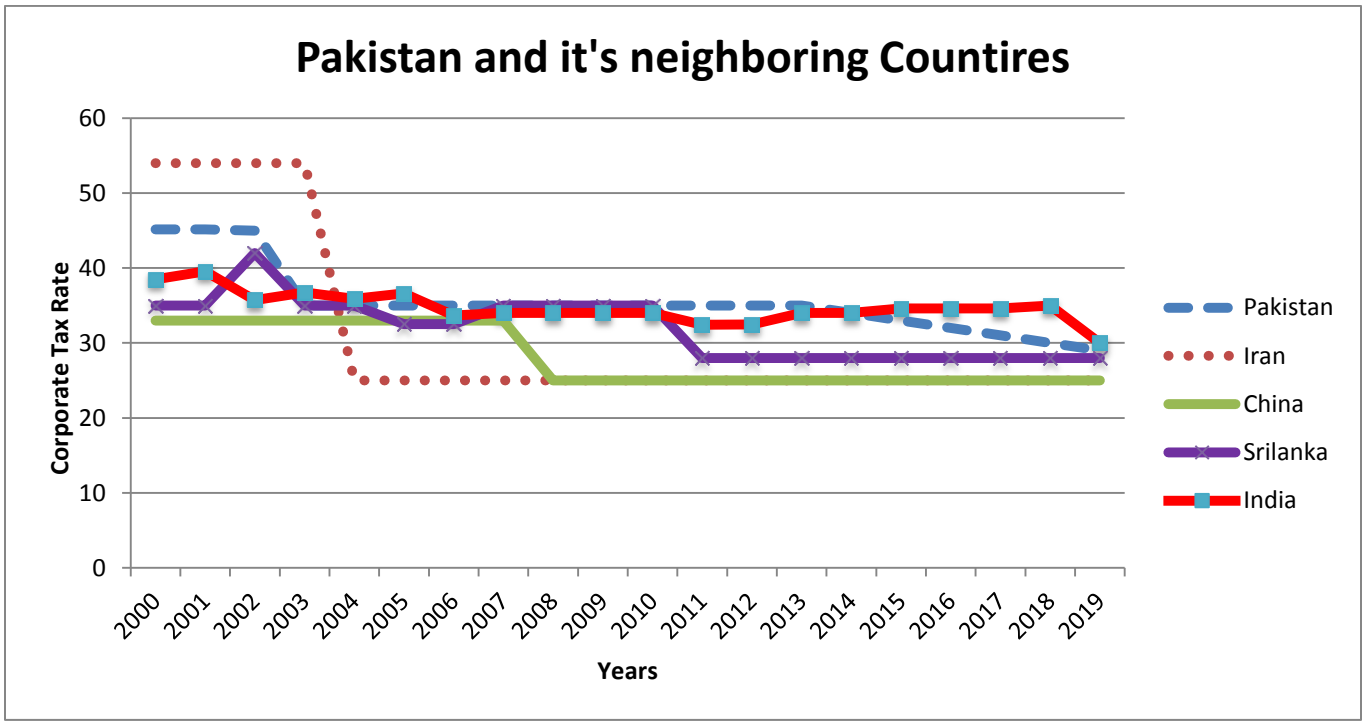
Year	Pakistan	Iran	China	Sri Lanka	India
2000	45.15	54	33	35	38.5
2001	45.15	54	33	35	39.55
2002	45	54	33	42	35.7
2003	35	54	33	35	36.75
2004	35	25	33	35	35.875
2005	35	25	33	32.5	36.5935
2006	35	25	33	32.5	33.66
2007	35	25	33	35	33.99
2008	35	25	25	35	33.99
2009	35	25	25	35	33.99
2010	35	25	25	35	33.99
2011	35	25	25	28	32.44
2012	35	25	25	28	32.45
2013	35	25	25	28	33.99
2014	34	25	25	28	33.99
2015	33	25	25	28	34.61
2016	32	25	25	28	34.61
2017	31	25	25	28	34.61
2018	30	25	25	28	35
2019	29	25	25	28	30

Source: Organization of Economic Corporation and Development (OECD)

Table2.1: In the context of Pakistan the corporate tax rate is 29 percent in 2021, which is relatively higher as compare to the world wide average corporate tax rate which is 23.54 percent. Even though in the neighboring countries of Pakistan's have lower corporate tax rate, like Sri Lanka has 24 percent, Afghanistan has 20 percent, china has 25 percent and similarly Iran also imposed 25 percent corporate tax rate on business sector. But India have 30 percent corporate tax rate on business. The average corporate tax rate in Pakistan between from 1980 to 2020 was 43.10 percent with highest range is 55 percent in 1980 and lowest range is 29 percent in 2020.

The Below Chart presents the corporate tax rate comparison between Pakistan and its neighboring countries. Since 2000-2019 corporate tax rate in Pakistan was comparatively higher than its neighboring countries (Iran, China and Sri Lanka) except India with 30 percent corporate tax rate in 2019.

Fig 2.2: **Comparison of Corporate Tax rate**



Source: Organization of Economic Corporation and Development (OECD)

2.5 Comparison of Sales tax rate between Pakistan and the Rest of the World

Governments all throughout the world rely heavily on consumption taxes for revenue. If a consumer tends to purchase any particular commodities from a grocery store or another merchant, then consumer will almost certainly have to pay tax on it. Consumption taxes, like many other tax laws, are not universal over the world. While they account for one-third or more

of revenue in many of the 37 nations that make up the Organization for Economic Co-operation and Development (OECD), this scenario varies across the globe.

Consumption tax policies are so crucial for raising revenue, it's critical to understand how they're designed, how they work, and where governments are choosing better or worse ways to raise income from purchases. Sales of products or services are subject to consumption taxes. Sales taxes, value-added taxes (VAT), and excise taxes are the three main types of consumption taxes. While sales taxes and VATs are typically applied to a wide range of goods and services, excise taxes are exclusive to a single product.

Only ten of the 37 OECD nations collect money from general sales taxes, with the United States leading in both total revenue (8.2%) and revenue as a percentage of GDP (2 percent). Spain, on the other hand, collects less than 0.1 percent of total income and less than 0.1 percent of GDP in sales taxes.

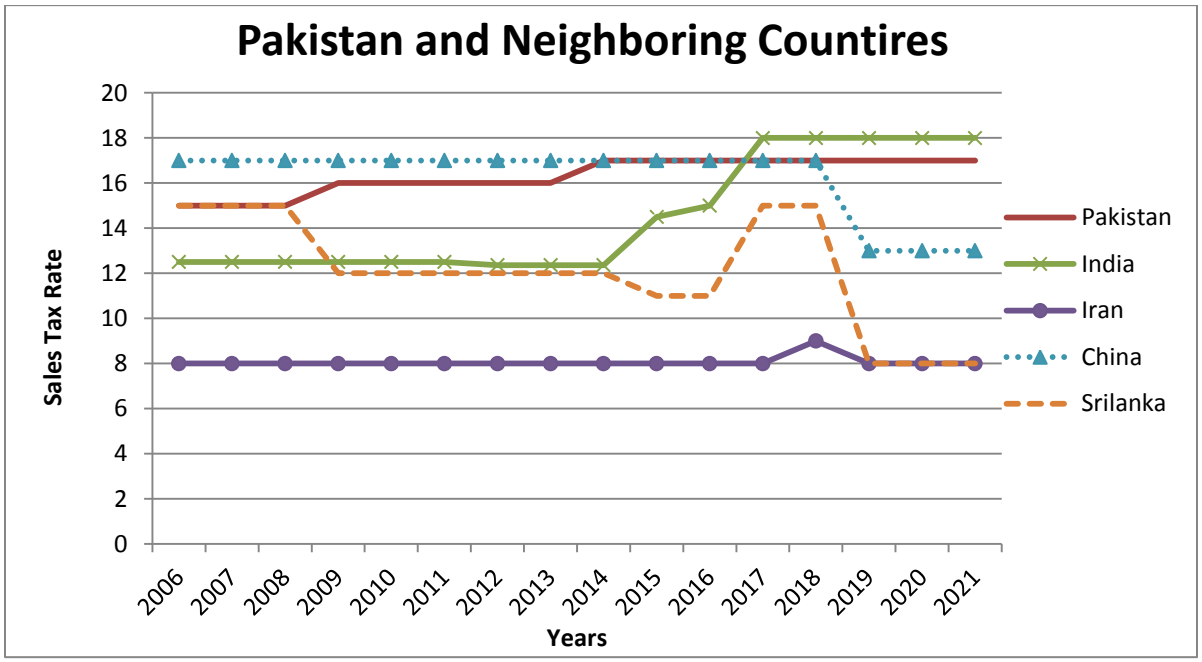
In Pakistan Sales Tax Act of 1990 imposes a tax on the sale and service of commodities, as well as on items imported into Pakistan, by the Federal Government. The Federal Government imposes a sales tax on services under the Islamabad Capital Territory (Tax on Services) Ordinance, 2001.

In the context of Pakistan the Sales tax rate is 17 percent in 2021 which is relatively higher comparing to the world wide average sales tax rate. Even though the neighboring countries of Pakistan have lower sales tax rate e.g. Sri Lanka has 8 percent, china has 13 percent and similarly Iran also imposed 8 percent Sales tax rate on good and Services. However India has 18 percent sales tax rate on good and services which is higher than Pakistan. The average sale tax

rate in Pakistan between from 2006 to 2021 is 16.31 percent with highest range is 17 percent in 2021 and lowest range is 15 percent in 2006.

The Below Chart presents the Sales tax rate comparison between Pakistan and its neighboring countries. Since 2006-2021 sales tax rate in Pakistan is comparatively higher than its neighboring countries (Iran, China and Sri Lanka) except India in 2021.

Fig 2.3: **Comparison of Sales Tax rate**



Source: Organization of Economic Corporation and Development (OECD)

2.6 Sector-wise Growth rate and Contribution in GDP

The below table provides information about four corporate sectors in Pakistan from 2016 to 2021. It shows corporate sectors' contribution to GDP and their growth rate.

Table 2.2: Sector-wise Contribution

Contribution to GDP				
Years	**Textile**	**Tobacco**	**Cement**	**Natural gas**
2020-21	1.94	0.19	0.49	NA
2019-20	-1.63	-0.41	-0.41	NA
2018-19	-0.43	-0.04	-0.10916	NA
2017-18	1.28	0.13	0.32	NA
2016-17	1.024835	0.10	0.25	NA
Growth rate				
Years	**Textile**	**Tobacco**	**Cement**	**Natural gas**
2020-21	5.90	17.76	25.14	-5.97
2019-20	-2.58	-31.45	1.74	-6.34
2018-19	-0.17	7.24	-5.45	-1.98
2017-18	0.10	77.56	11.95	-1.16
2016-17	0.16	-42.46	7.19	-0.10

Source: Economic Survey of Pakistan

Table 2.2: The table makes it very clear that there have been fluctuations in corporate sector's growth rate and their contribution to GDP each year. In 2020-21, Cement industry contributed 0.49 percent to the GDP and textile sector contributed 1.94 percent while the industry with least contribution was the tobacco that contributed 0.19 percent, and their growth rate was 25.14 percent, 5.90 percent and 17.76 percent respectively.

The following section explains the literature on the importance of corporate sector (Cement, Textile, Tobacco, and Natural Gas) in Pakistan and impact of taxes on these corporate sectors.

2.7 Cement Sector

The cement industry plays an important role to a country's economic growth. The cement sector empowers to the country's economic development through increasing employment opportunities, generating offshore money through exports, and expanding tax income (Ali, 2015). The cement industry's origins can be traced back to 1921, when a cement plant was installed in Taxila. This marked the beginning of the cement industry in the region, and until Pakistan's independence in1947, the cement industry in the region moved at a slower rate. During the 1960s, the industry grew at a 9.7% annual growth rate as six additional units were built in the 1950s and 1960s. After economic liberalization in the 1990s, the cement sector experienced rapid expansion.

Despite the concerns raised by COVID-19, Pakistan's cement sector has continued to thrive as a result of timely government initiatives. Private-sector construction, together with work at the Bhasha and Dasu dams, contributed in expanding local cement demand. In April 2020, the government introduced an incentive package for the construction industry, which boosted the economy, particularly private-sector housing developments. Amnesty, tax exemptions, and an Rs 36 billion subsidy for the Naya Pakistan Housing Scheme were all part of the package. In addition, banks have been instructed to expand construction sector loans to 5% of their overall loan book, and the FED's cut in cement prices from Rs 2/kg to Rs 1.5/kg has boosted the cement industry. The construction sector has seen a large increase in Foreign Direct Investment (FDI)1 and Long-Term Financing Facility (LTFF)2 .

Due to a large increase in domestic consumption as well as exports, the cement sector reported the highest ever year on year growth of 44.6 percent in March FY2021. Cement dispatches totaled 5.381 million tonnes, up from 3.719 million tonnes the previous year. Domestic consumption increased by 42% to 4.563 million tonnes in March FY2021, up from 3.213 million tonnes in March FY2020, The export trend increased by 61.6 percent to 0.818 million tonnes exports in March FY2021, compared to 0.506 million tonnes in the previous year.[9]

The cement sector in Pakistan has requested tax relief, claiming that the imposition of new tax has increased the burden on the cement sector. According to a member for the All-Pakistan Cement Manufacturers Association (APCMA), excesive taxes are the biggest challenge facing by the cement sector. He explained that the Federal Excise Duty was Rs 1,500 per tonne and Rs 75 each bag of cement, while the General Sales Tax was 17% and 100 Rs per bag, and provincial raw material taxes were 120 Rs per tonne. The government must provide significant assistance to the cement sector by rationalizing/lowering taxes and enabling its operations through the provision of subsidies. Because cement is such an important component for the housing industry, the government should explore lowering excise duties and Sales Tax. The government could increase cement consumption by implementing policies that promote industrialization and the housing and construction industries.[10]

[9] https://www.finance.gov.pk/survey/chapters_21/03-Manufacturing.pdf
[10] https://thefinancialdaily.com/pakistans-cement-industry-seeks-tax-breaks-apcma/

2.8 Textile Sector

Textile sector is Pakistan's most important manufacturing sector, with the longest production chain and intrinsic value addition possibilities at every stage of processing, from cotton to ginning, spinning, fabric, dyeing and finishing, made-ups, and garments. This industry accounts for about one-fourth of total industrial value added and employs roughly 40% of the workforce in Pakistan. Textiles have maintained an average proportion of roughly 60% in national exports, notwithstanding seasonal and cyclical swings. The textile industry has the biggest weight in the Quantum Index of Manufacturing (QIM), with a value of 20.91, and consequently has a major impact on large scale manufacturing's overall performance. Textile production climbed by 5.90 percent from July to March FY2021, compared to a 2.58 percent fall in FY2020.[11]

GST has a significant impact on the textile industry because it is the most extensively consumed product. The government of Pakistan has taken outstanding steps to simplify the refund process. However, past reimbursements (about Rs365 billion in the Sales Tax, Duty Drawback, and Income Tax refund regimes, and Rs85 billion in textile policy incentives like as the DLTL, TUF, and mark-up assistance plan) remain unpaid. To boost textile exports, textile exporters were given a Duty Drawback of Taxes (DDT) incentive based on their exports, which resulted in a considerable increase in textile exports. For growth to continue, the Duty Drawback of Taxes (DDT) incentive should be maintained.[12]

[11] https://www.finance.gov.pk/survey/chapters_21/03-Manufacturing.pdf
[12] https://www.thenews.com.pk/print/932588-growth-in-textile-exports-new-beginnings-new-hopes

2.9 Cigarettes Sector

Tobacco farming and cigarette production contribute only a small portion of Pakistan's economy, accounting for less than 0.5 percent of the country's GDP. The cigarette industry employs 0.2 percent of the workforce in the manufacturing industry (Model 2021).

Despite the fact that Pakistan was the ninth-largest tobacco grower in the world in 2018, tobacco remains a small crop in the country's agriculture industry. In 2019–20[13], tobacco crops covered 47 thousand hectares out of 23.5 million hectares, accounting for only 0.2 percent of the total planted area. Tobacco production in 2019–20 was 104 thousand tonnes, ranging between 100 and 116 thousand tonnes over the previous five years.[14]

In Pakistan, tobacco taxation has two goals: to discourage smoking and to increase revenue. Pakistani Tobacco Taxes Direct and indirect taxes are the two types of taxes. Direct taxes on income and corporations are the most common, while indirect taxes are on consumption, production, and imports . Income and corporation taxes are not commodity-specific taxes and hence cannot be classified as tobacco taxes in the context of tobacco taxation. Pakistan has three primary indirect taxes in addition to direct taxes. There is a general sales tax (GST) on local manufacturing and imports, as well as a Federal Excise Duty (FED) on specified commodities and import duties. Around 16 percent of GST is imposed on retail price of tobacco.[15]

[13] http://www.fao.org/faostat/en/#rankings/countries_by_commodity
[14] Pakistan Economic Survey 2019–20, Statistical Supplement, Table 2.2
[15] https://tobacconomics.org/files/research/726/spdc-rp-cge-report-final.pdf

2.10 Natural Gas

Carbon taxes have been used by states and local governments as an economic policy tool to reduce greenhouse gas emissions that contribute to global climate change for more than twenty-five years. As of early April 2019, these taxes had been implemented in 46 national and 28 subnational jurisdictions throughout the world. In the short term, a carbon price would reduce greenhouse gas emissions by encouraging the use of natural gas-fired electrical generation instead of coal. According to the World Bank Group, carbon taxes already in force throughout the world range from less than $1 per ton of CO2 in Poland to up to $127 per ton in Sweden.

The social cost of carbon emissions, according to most researchers, ranges $80-$300 per ton CO2, or as much as $417 per ton CO2. Carbon taxes are good for the environment since they lower greenhouse gas emissions in this sector (Hajek et al.,2018). When collected over a longer period of time, carbon taxes are more effective than emissions allowance trading (Lin & Li, 2011). According to various theoretical stability or supply function model studies, CO2 taxes decrease energy industry emissions (Green, 2008; McKibbin, 2015).

Studies have indicated that NGCC is overtaking coal generators as the induced sources of power due to cheap natural gas pricing and the environmental benefits of NGCC compared to coal (Salovaara, 2012). Stevens (2020) not only helps to combat climate change and reduce carbon emissions, but it also considers economic considerations about energy transitions. This centrist policy strategy decreases reliance on fossil fuels while preserving access to low-cost, clean energy sources.

2.11 Literature on Corporate Sector taxes

Indirect taxes have traditionally played a significant role in Pakistan's tax system. Because of the prevailing assumption that indirect taxes are regressive and interfere with effective resource allocation, this has alarmed economists of all ages. There is limited research on tax incidence and tax shifting in Pakistan. Some studies have attempted to look at the overall tax structure's impact, however these analyses have relied on a number of unjustified assumptions. In each case, it was revealed that indirect taxes are not passed on to the user, contrary to common thought (Radhu 1965). A number of observations on price changes in response to changes in excise and sales tax rates were gathered, and price changes were regressed on the change in tax rate. The findings did not support the assumption that indirect taxes are passed on to the customer (Radhu 1965). There was no attempt to weight goods according to their significance to excise and sales tax collection, and the most of the observations were about minor sales tax adjustments. Azfar (2018) examined the tax structure's incidence using two sets of assumptions: one assumes that all indirect taxes are moved forward, and the other assumes that most import tariffs are carried by the traders. From both circumstances, the taxation system is progressive, however in the later example, the degree of progressivity is exceptionally high. The study's main result is that indirect taxes performed a progressive function among the income categories that do not pay income tax (i.e., the poorest 95 percent of families), but direct taxes had no impact. These forecasts were based on a set of purely arbitrary assumptions about how taxes on cigarettes and petroleum goods, among other things, were distributed throughout income levels.

There's a strong argument to be made that entrepreneurial activities and R&D (Research and Development) in general deliver such positive spillovers. Externalities might originate from a number of different sources. (Lucas Jr 1988) demonstrated that positive externalities can be

generating by education, since people learn by seeing others' conduct. (De Long and Summers 1991) illustrate that investment in equipment can have significant positive spillovers. Therefore high corporate tax rate will discourage the entrepreneurs to invest less in Research and Development which ultimately hinders the positive spillovers and this will create an adverse effect on economic growth.

The quantity of R&D activity is influenced by patent protection and R&D funding. Tax policy can also have a broader impact on the quantity of entrepreneurial activity (Gentry and Hubbard 2000). They also demonstrated that due to higher corporate tax structure the investor avoids risk-taking investment. (Gordon and Cullen 2002) illustrates that the option to incorporate means to a low corporate tax rate compared to personal income tax encouraged risk-taking. (Gordon and Cullen 2002), investigated the various possible impact of the tax structure on the corporate sector and found a significant empirical impact on these sector by using US tax return data from 1964 to 1993. A better taxation system can increase the growth of an economy (Schumpeter 2010). Human capital investment seems to have more sophisticated tax consequences. According to (Trostel 1993).

(Mankiw, Romer et al. 1992) regressed growth rates on primary school enrollment rate and GDP per capita, (Barro 1990) political stability, price distortion and government expenditure. Even though there is debate over the proper measure of education, as it is projected to be the most significant element determining economic growth (Benhabib and Spiegel 1994).

(Rodriguez and Rodrik 2000), show that the trade openness has a great impact on economic growth of an economy. (Widmalm 2001) analyzed the relation between taxation and economic growth, using 23 OECD countries data from 1970-1997. This study concludes that there is an

adverse relation among individual income tax rate also includes capital income and economic growth because high labor income tax may distort the labor leisure choice. According to the economic growth theory predicted that low return on capital accumulation lead to negative growth. This study also state that there is significantly positive relation between tax share and growth. (Lee and Gordon 2005) showed the impact of taxation system on economic growth, using panel data from 1970-1997. The study conclude that corporate tax rate adversely correlated with economic growth rates, controlling for various other determinants of economic growth, in this research the estimates proposed that if the corporate tax rate decrease by 10 percentage than I will lead to increase the growth by one to two percentage.

Forbin et al (2011) performed another research in which he examined the quantitative effect of corporate tax on GDP growth rate utilizing time series data from 1951 to 2010 for Sweden. As according economic theory, tax structure must have a significant effect on growth. But, this research found that business corporate tax rate has no substantial impact on Swedish economic development, however other study (lee and Gordon, 2005; Widmalm, 2011 and Saqib, Ali et al. 2014) showed the relationship between taxation and economic growth.

(Saqib, Ali et al. 2014) examined the impact of tax structure on economic activity in Pakistan over time (1973 to 2010). They constructed an investment, consumption, and expansion growth models to investigate the impact of taxes on economic activity in Pakistan. According to the findings, the tax-to-GDP ratio has an adverse impact on real GDP, negative and significant effect of personal income tax on investment and negative effect of VAT on household consumption.

The presence of undocumented economy and its potential of growing with unusual pace and administrative flaws provide them space to expand, which must be stop on time before it become

impossible or difficult to change. There is a need to document that informal sector, for large setup, it is difficult to operate or remain as informal way so in the beginning of reforms provide reductions or amnesty for these informal units of economy, in the long run their contribution will slowly adjust in taxation system and will take part in tax growth of nation (Khalid & Nasr, 2020).

(Munir and Sultan 2018) showed that in the context of Pakistan, direct tax have a long-term impact on economic growth, while indirect tax have a positive effect in long-term and short-term on economic growth. But this study also demonstrated that sales tax have negative impact on economic growth in the short-run.

According to another study by Nizamani (2020), tax structure and financial development are negatively linked. This study stated that the impact of corporation tax rates, personal income tax rates, and expenditure tax levels on GDP growth rate.

(Ahmad, Sial et al. 2018) analyzed the empirical relation between indirect taxes and economic growth in Pakistan for the period of (1974-2010). This study concluded that there is significantly negative effect on economic growth in long-term but in short-term indirect tax (Sales tax) has insignificant effect on economic growth.

2.12 Research Gap

In literature review we have studied many papers which highlighted that the tax structure has significant impact on economic growth. Some of these studies conclude that corporate tax rate and sales tax have significantly negative effect on economic growth and on the other hand few studies conclude that there is no significant relationship among corporate tax rate and economic growth. However in the context of Pakistan there is no such particular study has been conducted to demonstrate the effect of tax rate change on the specific sector outcome and what is their corresponding impact on overall economic growth. So this thesis will be helpful to estimate on the effect of Effective sales tax rate of different corporate sector and corresponding impact on overall economic growth in Pakistan and will propose better tax structure recommendations based on these estimates.

CHAPTER 3

Theoretical Background

3.1 Theoretical Background of Tax and Economic Growth

Theoretical background includes different economic growth theories and how tax rates and others factors effect economic growth.

3.1.1 Taxes and Economic Growth

A varied range of methods in which the tax system might impact apparent economic growth rates have been identified in previous studies (lee and Gordon, 2005; Widmalm, 2011 and Saqib, Ali et al. 2014), we further describe these impacts in this section, We exclusively concentrate on such impacts that can be quantified inside the existing evidence regarding tax structures in the time series analysis for Pakistan because the aim of our study is to conduct empirical investigation. Jaimovich and Rebelo (2015) find the effect of taxation on growth non-linear and that low or moderate tax rate have a small impact on the long-run growth rate, however, as the tax rate rises, the negative impact of taxation on growth increases dramatically.

3.1.2 Taxes and Factor Accumulation

The economy is built solely on the development of human and physical capital, as according neoclassical growth model. In the long-run, a tax structure can create balance among the capital/labor ratio and the educational qualifications per employee. An increase in exogenous rate with technological development can result in even more gains in per capita output. Irrespective of the size of the taxation structure's misdistribution, there must be no long-run

impact on the per capita output's growth (Hall and Jorgenson 1967). Ahmad et al. (2018) analyses the impact on indirect taxation in the country for time series data (1974-2010) and confirms the negative effect of indirect taxation on growth. The study declares that one percent increase in indirect taxes reduces growth by 1.68 percent.

3.1.3 Taxes in an Endogenous Growth Framework

The research based on Solow growth model offer methods for forecasts long-rum growth with a static taxation system. The current incentives to investment in physical and human capital assets continue to be the most concerning aspect; growth rates should be higher during the periods of more incentive. We will not be using a long enough period of time to measure whether impact on growth die out perhaps after quite a few decades according to neoclassical model, or permanent as in endogenous growth model (Lee and Gordon 2005). Djankov et al. (2011) in an investigation of 85 countries discovered a large negative effect of corporate income tax on aggregate investment, FDI and entrepreneurship.

3.1.4 Endogenous Government Policies

Richer nations' tax structures clearly differ from those of poorer ones, with a greater dependence on the individual income tax and a propensity to greater tax amounts in wealthier nations.

Throughout times of rapid development, there will be a significant need for new infrastructure investment, implying that great taxes will be necessary to fund these expenditures. There's no way to rule out the possibility that strong growth rates have an impact on tax rates and government policies in general (Lee and Gordon 2005).

Any additional government policies can have an impact on the rate of entrepreneurial activities. We will need to govern for additional related strategies in direction to separate the effect of taxation per se. direct measures that encourage innovation, like as R&D grants, and possibly will be beneficial. However, for our sample, we are unable to locate any data on R&D subsidies (Lee and Gordon 2005).

3.2 Theoretical Framework

As per the neoclassical growth theory, in the long-run any adjustment in fiscal policy will not effects the steady state growth of the economy (Ramsey, 1928; Solow, 1989). Endogenous growth theories, on the other side, predict that any adjustment in taxation policy will result in an irreversible shift in the economy (Romer, 1986; Lucas, 1988: Rebelo, 1991). In endogenous growth, tax reform that distorts the motivations to acquire human and physical capital would cause the country's economic rate of increase to be reduced dramatically. As a consequence, taxes on capital accumulation and capital, including such corporate tax rate and sales tax, will reduce economic growth. However, not all taxes affect the economy adversely, thus the taxation mix becomes a significant growth factor. If the labor supply is inelastic, than the Sales tax will have no effect on an individual's intertemporal spending choices, leaving capital accumulation decisions and growth unchanged (Rebelo, 1991). Rebelo and Kind (1990) and Jones et al (1993), measured the distortionary effect of taxation system on productivity expansion for the US economy and found that the effects of these taxes ranges from small to very large on economic growth.

For growth analysis we simplicity take the Cobb-Douglas production function, therefore per capita output satisfies.

$$f_t(k_t) = \alpha_t k^a_t h^\beta_t e^\eta, \quad \textbf{(3.1)}$$

In equation (3.1) k denotes the Per capita capital, and h represents the average human capital per labor. Therefore, the growth rate for economy's output satisfies:

$$\dot{F}/f = \dot{\alpha} + \alpha (\dot{k}/k) + \beta (\dot{h}/h) + \dot{\eta}. \quad \textbf{(3.2)}$$

If there is any efficiency increase caused by entrepreneurial activity will seem in the first term, $\dot{\alpha}$, so that tax effect on entrepreneurship activity will be seen here.

The 2nd and 3rd term in Eq. (3.2) show any variations in the capital/labor proportion and the average standard of education per employee. This may be attributed in part to current changes in taxation.

Regulatory Framework

3.3 Regulatory Framework

This chapter presents the policy framework adopted by the government of Pakistan, The recent Policies Tax Amnesty Scheme (2020-2021) & The Impact on the Cement Industry of Pakistan. Textiles and Apparel Policy (2020-25) by Ministry of Commerce to boost Textile sector, and Track and trace system in 2021.

3.3.1 Policies Tax Amnesty Scheme (2020-2021) Review

Policies Tax Amnesty Scheme (2020-2021) & the Impact on the Cement Industry of Pakistan initiative is unveiled (Ashfaq et. al, 2022) under the Assets Declaration Ordinance, 2017. The assumptions made in the TAS 2019 were 'there exist large scale non declaration of assets, sales and expenditure and it is prudent to make provisions for the declaration of assets.

Under the tax amnesty scheme to the cement industry, tax exemptions and Rs.30bn subsidy is provided for the NAYA Pakistan. In the pandemic period, the domestic consumption of cement witnessed decline by 16.7% in March 2020. Therefore, to push the construction industry from the loss government introduced amnesty scheme[16].

The continuity of tight monetary policy (Khan, 2010) causes an intensive increase in cost of production. Due to high interest rate financing cost increases which cause a severe effect on production. The withholding tax of 1% effects the production badly. The high cost of doing business is because of intensive increase in the rate of interest which has increased the problems

[16] https://www.cemnet.com/News/story/169022/economic-survey-reviews-pakistan-cement-industry-for-fy19-20.html

of the industry. The government should take immediate measures to remove slowdown in the textile sector.

3.3.2 Textiles and Apparel Policy (2020-25) Review

The textile policy of 2009-14 was introduced by the (Khan, 2010) Ministry of Textile. Under this policy many factors were identified such as inadequate infrastructure facilities; the absence of exclusive areas dedicated to textiles production and provided with key services such as power, gas, and clean water; the lack of skilled labor; and the fact that the regulatory framework increased the cost of doing business.

The key measures of this policy were Duty drawback scheme (DLTL/DDT) for value-added textile products only i.e. technical textiles, apparel, made-ups and carpets. Long Term Financing Facility (LTFF) and Export Financing Scheme (EFS) rates will be continued at 5% and 3% respectively during FY 2021-22.

During Policy period, the Federal Government will ensure that energy prices remain regionally competitive and rationalized among provinces. The problem in Pakistan is with using existing (McCartney, 2014 capacity (productivity), not with a lack of capacity (investment). There is no obvious constraint to meeting any extra demand. In the cotton-spinning sector in 2011, capacity utilization was 89 percent in spindles and 60 percent in rotors. Low rates of capacity utilization were also characteristic of textile, cement, and fertilizer. In the jute industry between 2011/12 and 2012/13, there were small increases in the number of spindles and looms installed but significant falls in the number of spindles and looms actually worked.

3.3.3 Track and trace system in (2021) Review

Since July 1st, 2021, Pakistan implemented the Track and Trace Solution across the Tobacco, Cement, Sugar, and Fertilizer Sectors in an effort to increase tax revenue, lower counterfeiting, prevent the smuggling of illegal goods and to control sales tax evasion of big corporate sectors through the implementation of a robust, nationwide, electronic monitoring system of production volumes and by the implementation of more than 5 billion tax stamps on various products at the production stage, which will allow FBR to track the movement of goods.[17] This approach will lead to computerized monitoring of the production and large-scale manufacturing of these important sectors and it will aid in decreasing human interaction in addition to preventing Revenue leaks, paving the path for a trustworthy and transparent tax compliance system in the whole country.

[17] https://www.fbr.gov.pk/introduction-track-and-trace/152962/152963

Chapter 4

Data and Methodology

4.1 Introduction

In this chapter the study will briefly discuss the Conceptual frame work, description of data and econometric methodology in details.

4.1.1 Conceptual Framework

High corporate tax rate and effective sales tax rate (Forbin, 2011) have distortionary impact on the economy. Since entrepreneurial/ business, corporate finance and open economic activities are linked with the fiscal policy variable. Moreover these result to readjustments in wages, investment, labor productivity, employment and business location, all of which lead to economic inefficiency.

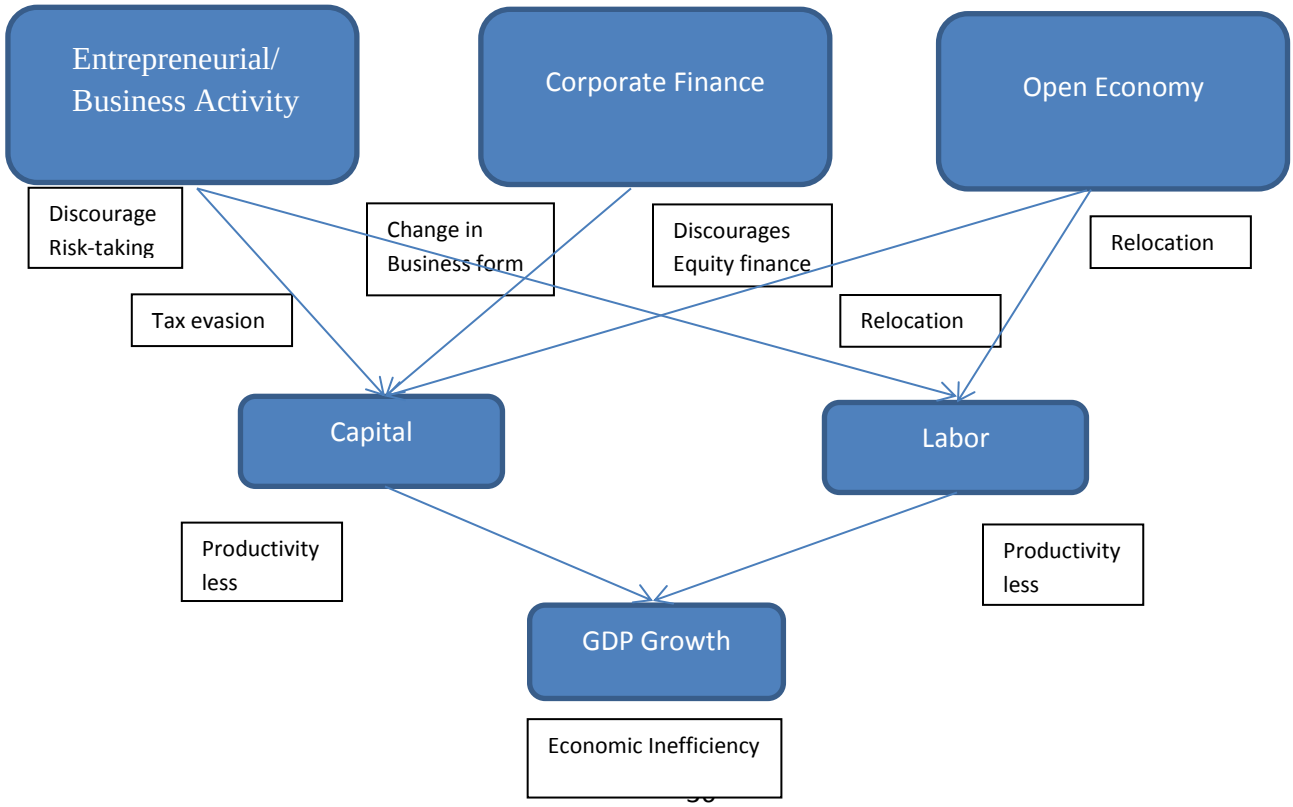


Figure 4.1: The conceptual frame work map shows how top statutory corporate tax rate effect economic growth

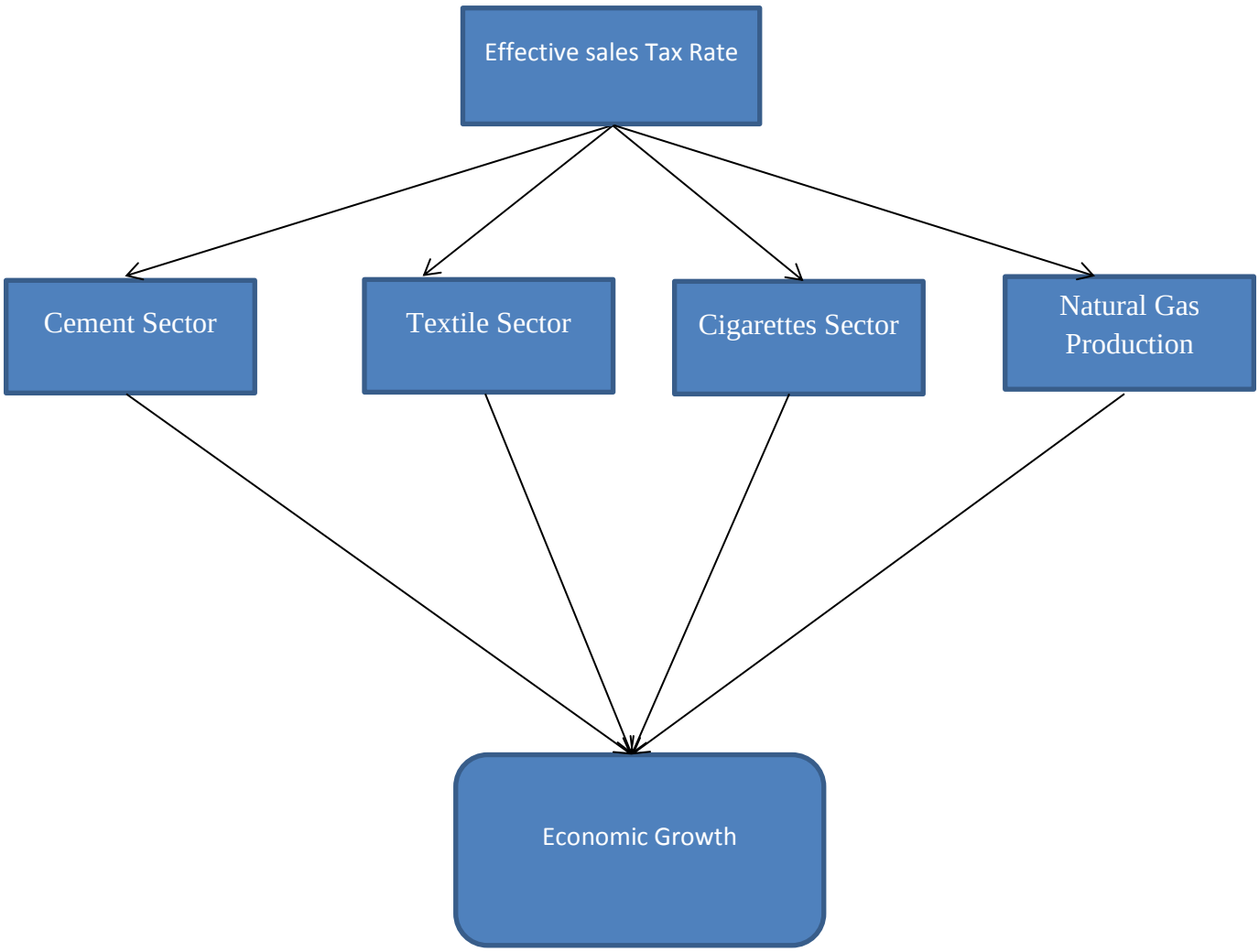


Fig 4.2: Conceptual Framework

In Figure 4.2: The conceptual frame work map shows impact of effective sales tax rate change on the specific sector outcome and their corresponding impact on overall economic growth. Our main objective is to investigate the effects of sectorial tax policies especially effective tax rate on different sectors performance and their corresponding impact on overall GDP growth.

4.1.2 Econometric Model for Corporate Sectors

An econometrics model shows the statistical relationship between dependent and independent variable supported by specific economics theory. In this study for the econometric models we will use indirect strategies. In this strategy we will use two regression models; in the first regression model we estimate the effect of effective sales tax rate on four corporate sector's production and in the second regression model we will analyze the effect of estimated corporate sector's production on economic growth by using ARDL technique.

Thus in first regression model there will be 6 different models to analysis the effect of effective sales tax rate on each corporate sector.

The basic specification

First regression model

Model 1

$$Cemy_t = \beta_{0+} \beta_1 CemERT_t + \mu_t \quad \textbf{(4.1)}$$

Whereas,

$Cemy_t$ represents the production of cement at time t and $CemETR_t$ represent the effective sales tax rate of cement sector.

Model 2

$$Cigy_t = \beta_{0+} \beta_1 CigETR_t + \mu_t \quad \textbf{(4.2)}$$

Whereas,

$Cigy_t$ represents the production of cigarettes at time t and CigETRt represent the effective sales tax rate of cigarettes sector.

Model 3

$$NGy_t = \beta_{0+} \beta_1 NGETR_t + \mu_t \quad \textbf{(4.3)}$$

Whereas,

Ny_t represents the production of natural gas at time t and $NETR_t$ represent the effective sales tax rate of natural gas.

Model 4

$$Cfaby_t = \beta_{0+} \beta_1 CfabETR_t + \mu_t \quad \textbf{(4.4)}$$

Whereas,

The dependent variable includes production of cotton fabric $Cfaby_t$ at time t. while the independent variable is effective sales tax rate of cotton fabric (CfabETR).

Model 5

$$Cyay_t = \beta_0 + \beta_1 CyaETR_t + \mu_t \quad \textbf{(4.5)}$$

Whereas,

The dependent variable includes production of cotton yarn $Cyay_t$, while the independent variable is effective sales tax rate of cotton yarn $CyaETR_{t.}$

Model 6

$$Jy_t = \beta_{0+} \beta_1 JETR_t + \mu_t \quad \textbf{(4.6)}$$

Whereas,

The dependent variable includes production of jute Jy_t at time t. while the independent variable is effective sales tax rate of jute $JETR_{t.}$

In second regression model there will be single growth model

Second regression model

$$Y_t = \beta_0 + \beta_1 eCem_t + \beta_2 eCig_t + \beta_3 eNG_t + \beta_4 eCFabric_t + \beta_5 eCyarn_t + \beta_6 eJute_t + X_t + e_t \quad \textbf{(4.7)}$$

Whereas,

Y_t: Per capita income at Factor cost.

$\beta 0$: is an intercept of the model.

β_1-β_6: are the coefficient of the dependent variables.

$eCem_t$: is estimated value of Cement production.

$eCig_t$: is estimated value of Cigarettes production.

eNG_t: is estimated value of Natural Gas production.

$eCFab_t$: is estimated value of Cotton Fabric production.

$eCya_t$: is estimated value of Cotton Yarn production.

$\beta_6 eJute_t$: is estimated value of Jute production.

X_t: control vector, which is taken as Gross fixed capital formation GFCF.

4.2 Brief overview of the Data

In this study is used time series data from 2000 to 2019 and which includes different variables and all the variables are quantitative in nature. The following table has been used for the analysis.

Table 4.1: The Detailed Data Description is as Follow

Variables	Symbol	Description	Source
GDP per capita income at Factor Cost	Y_t	GDP Per capita income at Factor cost in Million Rs	Pakistan Bureau of Statistics
Corporate tax rate	CTR	Corporate tax rate	Federal Board of Revenue
Cement Production	$CemPT_t$	Cement Production in Tonnes.	State Bank of Pakistan
Effective tax rate of Cement Sector	$CemERT_t$	Cement per Tonne unit tax in Rs	Federal Board of Revenue
Cigarettes Production	$Cigy_t$	Cigarettes Production in Nos	State Bank of Pakistan
Effective tax rate of Cigarettes	$CigETR_t$	Cigarettes per Nos unit tax in Rs	Federal Board of Revenue
Natural Gas Production	NGy_t	Natural gas Production in CFT Unit	State Bank of Pakistan
Effective tax rate of Natural Gas	NGETR	Natural Gas per CFT unit tax in Rs	Federal Board of Revenue

Cotton Fabric Production	$Cfaby_t$	Cotton Fabric Production in Sq.M	State Bank of Pakistan
Effective tax rate of Cotton Fabric	$CfabETR_t$	Cotton Fabric Sq.M Per unit tax in Rs	Federal Board of Revenue,
Cotton Yarn Production	$Cyay_t$	Cotton Yarn Production in Tonnes	State Bank of Pakistan
Effective tax rate of Cotton Yarn	$CyaETR_t$	Cotton yarn tonnes Per unit tax in Rs	Federal Board of Revenue,
Jute Production	Jy_t	Jutes Production in Tonnes	State Bank of Pakistan
Effective tax rate of Jute	$JETR_t$	Jute Tonnes Per unit tax in Rs	Federal Board of Revenue,
Control vector	X_t	Control vector, includes Gross fixed capital formation GFCF (Million), and Inflation rate.	State Bank of Pakistan

4.3 Estimation Technique

In econometrics various con-integration techniques for instance Johansen (1988), Engle-Granger (1987), Peraran (2001) ARDL are used. This study has used time series and secondary data for the period 2000 to 2019 and applied two different regression models to investigate the short run and long run effect of tax structure on economic growth in Pakistan. In the first regression model we estimated the effect of effective sales tax rate on four corporate sector's performance (Cement, Textile, Cigarettes and natural gas) and in the second regression mode we analyzed the effect of estimated corporate sector's on economic growth, this study deals with Quantitative dependent variables. Order of integration of all variable will be evaluated separately, if we ignore the problem of unit root our result will lead to spurious result, after that if the data is stationary then we will proceeds to co-integration technique. We will use ARDL (Autoregressive Distributed lag) co-integration for both regression models. Firstly; a descriptive analysis will be made before the estimation of the models.

4.3.1 Unit Root Test

Time series data shows trending behavior. Therefore it is an obligation in econometrics is to determine the most suitable form of data trends

In this series non-stationarity of the variable is common and creates the problem of spurious regression. Therefore we start by testing the variables for non-stationarity. The pre-tests (unit roots) are the necessary before estimating the equation as non-stationary variables may not be used for regression unless co-integrated (Hystad et al, 2015).Therefore the Augmented Dickey Fuller (ADF) unit root is estimated for all the model variables.

The hypothesis for the ADF is given as

H0: Data is non-stationary i.e. there is unit root

H1: Data is stationary i.e. no unit root

The stationarity of the data can be interpreted through p-value. If the p value is greater than 5% then we will accept (see Khan 2016) the H0 i.e. presence of unit root. And if the estimated p value is less than 0.05 then we will reject the H0 and data confirm the no unit root means that data is stationary. Another assumption for the ARDL is that if the data follows the second order integration I (2) then this method cannot be applied. Therefore no variable should be I (2).

4.3.2 Formal Procedure for the ADF

$$\Delta X_t = \beta_0 + \beta_{1t} + \beta X_{t-1} + \sum_{j=1}^{p} \delta j \, \Delta \mathrm{Xt}_{t-1} + \mathrm{U}_t \qquad \textbf{(4.8)}$$

Where ΔX_t indicates the first difference and p denotes the lag order at time t. In ADF test when H0 is rejected i.e. X variable is non-stationary (see Khan 2016) and($H_0 : \beta = 0$) if β is significantly negative.

When the model shows non-stationary results at level then they are transformed into first difference and then the null hypothesis is tested to achieve the stationarity. One of the assumptions of the ARDL bound test is that (see Khan 2016, Lwin 2017) all the variables must be integrated at I(0) and I (1) not at I (2) as when the data follows the I (2) order ARDL bound model will yield spurious results.

4.3.3 Autoregressive Distributive Lag (ARDL) Approach to Co-integration

To analyze the presence of co-integration we apply the bound test ARDL approach. Thus the relationship among the tax and production is evaluated through ARDL bound testing approach. The ARDL method was developed (see Haq & Larsson, 2016) by Pesaran & Shin in 1998 and further modified in 2001 by Perasan et al. In analyzing co-integration and long run relations this method is preferred over traditional statistical methods due to its several advantages (Haq & Larsson 2016, Khan 2016, Afzal et al. 2013) such that ARDL may be applied for the combined I (0) and I (1) as well as for I (1) and I (0) while Engle and Johansen tests cannot be applied for the mix level co-integration. On other side, for the higher order integration I (2), this method (ARDL) will reveal spurious results. Many co-integration techniques such as Johansen and Engle tests are sensitive to the sample size while ARDL is the robust methodology for the small sample sizes (Haq & Larsson, 2016). Financial time series is often the combination of I (0) and I (1) therefore this method is quite advantageous. Furthermore the ARDL explains the short run impact without dropping the long-run information by using error correction method. Although long run and short run impact can be assessed simultaneously.

In the light of the proposed advantages, ARDL method is utilized in our study to access the long run and short run effect tax structure on different corporate sectors outcome and their corresponding impact on overall economic growth.

4.3.4 The ARDL model for Effective sales tax rate

First regression model

$$\Delta ln\text{Cemy}_t = \beta_O + \sum_{i=1}^{q}\beta_1 \Delta ln\text{CemERT}_{t-1} + e \quad \textbf{(4.9)}$$

$$\Delta ln\text{Cigy}_t = \beta_O + \sum_{i=1}^{q}\beta_1 \Delta ln\text{CigETR}_{t-1} + e_t \quad \textbf{(4.10)}$$

$$\Delta ln\text{Ny}_t = \beta_O + \sum_{i=1}^{q}\beta_1 \Delta ln\text{NETR}_{t-1} + e_t \quad \textbf{(4.11)}$$

$$\Delta ln\text{Cfaby}_t = \beta_O + \sum_{i=1}^{q}\beta_1 \Delta ln\text{CfabETR}_{t-1} + e_t \quad \textbf{(4.12)}$$

$$\Delta ln\text{Cyay}_t = \beta_O + \sum_{i=0}^{p}\beta_1 ln\Delta\text{CyaETR}_{t-1} + e_t \quad \textbf{(4.13)}$$

$$\Delta ln\text{Jy}_t = \beta_O + \sum_{i=0} B_1 \ln\Delta\,\text{JETR}_{t-1} + e_t \quad \textbf{(4.14)}$$

Second regression model

$$\Delta lnY_t = \beta_O + \sum_{i=1}^{q}\beta_1 \Delta ln\text{eCemt}_{t-1} + \sum_{i=0}^{p}\beta_2 ln\Delta\,\text{eCigt}_{t-1} + \sum_{i=0} B_3 \ln\Delta\,\text{eNG}_{t-1} + \sum_{i=0}\beta_4 \ln\Delta\,\text{eCFabric}_{t-1} + \sum_{i=0}\beta_5 \ln\Delta\,\text{eCyarn}_{t-1} + \sum_{i=0}\beta_6 \ln\Delta\,\text{eJute}_{t-1} + \sum_{i=0}\beta_7 \ln\Delta\,X_{t-1} + e_t \quad \textbf{(4.15)}$$

Δ Show the first difference operator while the β_s show the long run and short run co-efficient. The hypothesis of no co-integration states that: H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$ and alternative hypothesis is on no co-integration i.e. H_1: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 \neq 0$

The first step is to estimate the ARDL equation through OLS method. The second stage in the analysis involves testing the Null hypothesis of no co-integration against the alternative hypothesis i.e. existence of co-integration by using the F-statistics. In accessing the long run relationship, if the estimated F-statistics is higher than the upper bound critical value the null

hypothesis H0 will be rejected (Haq & Larsson 2016, Makuyana & Odhiambo 2017) and the existence of the long run relationship is evident regardless of order of the integration.

4.3.5 Error Correction Model

The next stage involves the Error Correction Model ECM which determines the causal relation among the variables propounded by Engle and Granger (1987). When the co-integration is present, the ECM should be negative (Khan 2016) and significant as well as the value of ECM should be higher. Long run causality is determined through negative statistical ECM while short run causality is explained by the significance of the lagged explanatory variables.

ECM for the model given as:

First regression model

$$\Delta ln\text{Cemy}_t = \beta_O + \sum_{i=1}^{q} \beta_1 \Delta ln\text{CemERT}_{t-1} + \gamma ECM_{t-1} + e \quad \textbf{(4.16)}$$

$$\Delta ln\text{Cigy}_t = \beta_O + \sum_{i=1}^{q} \beta_1 \Delta ln\text{CigETR}_{t-1} + \gamma ECM_{t-1} + e_t \quad \textbf{(4.17)}$$

$$\Delta ln\text{Ny}_t = \beta_O + \sum_{i=1}^{q} \beta_1 \Delta ln\text{NETR}_{t-1} + \gamma ECM_{t-1} + e_t \quad \textbf{(4.19)}$$

$$\Delta ln\text{Cfaby}_t = \beta_O + \sum_{i=1}^{q} \beta_1 \Delta ln\text{CfabETR}_{t-1} + \gamma ECM_{t-1} + e_t \quad \textbf{(4.20)}$$

$$\Delta ln\text{Cyay}_t = \beta_O + \sum_{i=0}^{p} \beta_1 ln\Delta\text{CyaETR}_{t-1} + \gamma ECM_{t-1} + e_t \quad \textbf{(4.21)}$$

$$\Delta ln\text{Jy}_t = \beta_O + \sum_{i=0} B_1 \ln \Delta\, \text{JETR}_{t-1} + \gamma ECM_{t-1} + e_t \quad \textbf{(4.22)}$$

Second regression model

$$\Delta lnY_t = \beta_O + \sum_{i=1}^{q}\beta_1 \Delta ln\text{eCemt}_{t-1} + \sum_{i=0}^{p}\beta_2 ln\Delta\ \text{eCigt}_{t-1} + \sum_{i=0} B_3 \ln \Delta\ \text{eNG}_{t-1} + \sum_{i=0}\beta_4 \ln \Delta\ \text{eCFabric}_{t-1} + \sum_{i=0}\beta_5 \ln \Delta\ \text{eCyarn}_{t-1} + \sum_{i=0}\beta_6 \ln \Delta\ \text{eJute}_{t-1} + \gamma ECM_{t-1} + \sum_{i=0}\beta_7 \ln \Delta\ X_{t-1} + e_t \quad \textbf{(4.23)}$$

Δ Represents the difference operator, while γ should exhibit the negative significant sign (Alimi 2014) to confirm the long run relation. The null hypothesis for the variable is given as: H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$ and the alternative is: H_1: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 \neq 0$. F-statistics are used for testing the hypothesis.

4.3.6 Sensitivity Analysis

The diagnostics tests such as Ramsey test, ARCH, Jarque-Bera (JB) and LM test will be applied under the sensitivity analysis to ensure the validity of the data used in the model.

Chapter 5

Results and Discussion

5.1 Descriptive Statistics

The table below covers summary of descriptive statistics about the variables. Each variable has twenty total numbers of observations with annual time series data from 2000-2019. The average of GDP per capita income is 11.39 (in long term) with standard deviation is 0.68 respectively, Further the Jarque-Bera test used for normality states that the probability value of Jarque-Bera (JB) is greater than 0.05 which means that all the variables are normally distributed.

Table 5.1: Descriptive Statistics

Variable	Mean	Maximum	Minimum	Std. Dev.	Skew Ness	Kurtosis	Jarque-Bera	Probability
Y	11.39506	12.41477	10.32568	0.681802	-0.17262	1.627708	1.835516	0.399413
CemY	17.00397	17.53269	16.08495	0.479993	-0.851049	2.322193	2.797134	0.246951
CemETR	6.614118	7.728245	5.863356	0.599711	0.590777	2.211387	1.681651	0.431354
GFCF	14.99433	17.7319	12.52063	1.488359	0.318370	2.227684	0.834925	0.658716
CigY	-0.012298	0.542243	-0.443745	0.194232	0.563036	5.589828	6.313736	0.042559
CigETT	0.101573	0.282057	-0.386268	0.155864	-1.573166	6.116107	15.52421	0.080426
CFGD	2.703041	2.875371	2.527377	0.098530	0.153774	2.181492	0.637118	0.727196
INF	7.756815	20.28610	2.529300	4.529090	1.045861	3.912311	4.339676	0.114196
CTR	35.15714	45.15000	29.00000	4.650411	1.136233	3.741608	4.999828	0.082092

Cfaby	20.61773	20.76824	20.01024	0.237970	-1.576756	3.915564	8.985750	0.06188
CfabETR	-1.991343	0.095287	-3.818264	1.155049	-0.013955	1.991268	0.848600	0.654228
Cyay	14.82433	15.04848	14.35841	0.229612	-0.922747	2.458913	3.082184	0.214147
CyaETR	5.855991	9.057511	2.172256	1.862661	-0.324846	2.193990	0.893128	0.639823
JuteY	-0.028284	0.209721	-0.535962	0.176248	-1.313307	4.709199	7.774529	0.070501
JuteETR	0.050762	4.540855	-3.322092	1.767166	0.349442	4.041202	1.244929	0.536620
NGY	27.92658	28.07571	27.49784	0.169721	-1.640243	4.236001	10.24107	0.075973
LNNGETR	-4.636722	-3.699719	-5.961736	0.673039	-0.476409	2.402250	1.054306	0.590283

Source: Author's Estimations

5.2 Stationary-test for variables

5.2.1 Empirical Results

Before going for any analysis, it is necessary in econometrics to determine the relationship among the variables. Therefore to investigate the stationarity of the data ADF test would be applied. The results are summarized in Table 5.1. It can be noticed that natural log of some variables exhibit non-stationarity therefore to convert into first difference form may be used i.e. we evaluate the impact of independent variables on the each specific sectors variables, not level.

The ADF test is performed both in level I (0) and differenced forms I (1) with and without the trends i.e. with and without the intercept (γ). Some of the variables exhibit the stationarity at level (when adjust for trend) and some at first difference I (1) and no presence of higher order integration I (2) in our time series.

In this study, some variables are either I (0) or I (1) at the trend term Therefore the ARDL is most appropriate methodology for our model in contrast with other models for instance Johansen's test that is only appropriate for the variables (see Haq & Larsson, 2016) exhibiting I (0) or I (1) not the mix integration.

Table 5.2: Augmented Dickey Fuller Test (ADF)

	Level		First Difference	
Variable	**Intercept**	**Trend and intercept**	**Intercept first difference**	**Trend and intercept**
CTR	-2.472290	-3.038435	-4.459676	-4.525585
Y	-0.584742	-0.911849	-1.875656	-3.300841
GFCF	-1.647531	-3.734854	-3.509056	-3.342727
INF	-2.048609	-1.986477	-4.959230	-4.824341
Cemy	-2.630748	-0.660361	-2.309245	-3.457838
CemETR	-0.792777	-0.940077	-4.116359	-3.537387
CigETR	-0.235614	-2.679190	-3.705639	-3.588033
CigY	-2.593140	-2.672867	-4.836047	-3.560396
NGY	-3.882266	-1.252138	-1.574212	-3.354781
NGETR	-1.218216	-1.225661	-2.168930	-2.525695
CFabETR	-1.104218	-2.023388	-2.102675	-3.270341
CFaby	-3.069436	-1.552073	-1.597064	-4.422707
Cyay	-2.746762	-0.134986	-1.793473	-2.885264
CyETR	-1.526715	-1.318566	-2.823134	-3.012990
Jutey	-0.653341	-1.211033	-4.029924	-4.079699
JuteETR	-1.751554	-2.914854	-2.989845	-3.057218

Note: Null Hypothesis H0= Data is non-stationary i.e. existence of unit root. H1 Data is stationary i.e. has no unit root. Rejection of null hypothesis H0 (i.e. p value less than 0.05)

Source: Author's Estimation

5.2.2 Short-Run and Long-Run test

To evaluate the long run and short run relation among the model variables ARDL is applied on the entire period from 2000-2019. The below table shows the statistics summary of ARDL bound test. The ARDL bound test estimation involves the two stages. The first stage consists of testing the co-integration relationship among the variables. Further the long run relation is established when the lagged values of the variables are statistically significant. This will lead us to the 2nd stage which consists of estimating the long run and short run co-efficient of ARDL model. If the F-statistics estimated value is less than then the lower bound critical value (Makuyana & Odhiambo 2017, Afzal et al. 2013) then the H0 will be accepted i.e. no co-integration will be accepted i.e. not significant therefore establishing no long run relation. Further if the F-statistics value occurs between upper and lower bound critical values then the results will become inconclusive. The value of the F-statistics depends on the sample size, explanatory variables and constant/trend of ARDL.

Error correction model is used to capture the short run dynamics of the variables in first differenced form. Table below summarizes the long run bound test. The F-bound test statistics show that the performance variables share the long run relationship. These results of long run relationship support the findings of other studies such as Haq & Larsoon, 2016, Afzal et al, 2013, and Khan 2016.

Tables 5.3 shows that there is collectively and long run relationship exit in these econometric models.

Table 5.3: Long run form and Bound test

Dependent Variable	Function	F-Statistics	Co-integration status
Cement Production	F(CemETR)	12.67***	Co-integrated
Cigarettes Production	F(CigETR)	12.47***	Co-integrated
Natural Gas Production	F(NGETR)	7.31***	Co-integrated
Cotton Fabric Production	F(CfabETR)	6.64***	Co-integrated
Cotton Yarn Production	F(CyaETR)	4.84***	Co-integrated
Jute Production	F(JETR)	4.69***	Co-integrated
Economic Growth	F(eCemy,eCigy,eNG,eCfab,eCya,eJ)	37.59***	Co-integrated

Source: Author's calculations.

5.2.3 Long-run Estimation Results

The empirical result below shows that the relationship between the Cement production and Effective sales tax rate is negative and is statistically significant. A 1 percent increase in Effective sales tax rate will lead to a reduction of 15 percent in cement production

Table 5.4: Long run form and Bound test

Dependent Variable: Cement Production

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCemETR	-0.154289	0.325289	-0.474312	0 0417
C	18.79785	2.263249	8.305694	0.0000

Source: Author's calculations

The empirical result below shows that the relationship between the Cigarettes production and Effective sales tax rate is negative and is statistically significant. A one percent increase in effective sales tax rate will lead to a reduction more than 1 percent in Cigarettes Production.

Table 5.5: Dependent Variable Cigarettes Production

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCigETR	-1.214070	0.400115	-3.034300	0.0084
C	0.110146	0.049916	2.206640	0.0433

Source: Author's calculations

The empirical result below shows that the relationship between the Natural gas production and Effective sales tax rate is positive but is statistically insignificant.

Table 5.6: Dependent Variable Natural Gas

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN-NGETR	0.080300	0.062210	1.290783	0.2151
C	28.38689	0.295593	96.03355	0.0000

Source: Author's calculations

The empirical result below shows that the relationship between the Cotton Fabric production and Effective sales tax rate is negative and is statistically significant. A 1 percent increase in Effective sales tax rate will lead to a reduction of 4 percent in Cotton Fabric production.

Table 5.7: Dependent Variable: Cotton Fabric Production

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCfabETR	-0.043809	0.054364	-0.805849	0.0421
C	20.66407	0.126618	163.2000	0.0000

Source: Author's calculations

The empirical result below shows that the relationship between the Cotton Yarn production and effective sales tax rate is positive and is statistically significant. A 1 percent increase in Effective sales tax rate will lead to increase of 2 percent in Cotton Fabric production.

Table 5.8: Dependent Variable: Cotton Yarn Production

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCyaETR	0.027917	0.071192	0.392139	0.0305
C	14.93697	0.370376	40.32926	0.0000

Source: Author's calculations

The empirical result below shows that the relationship between the Jute production and Effective sales tax rate is negative and is statistically significant. A one percent increase in Effective sales tax rate will lead to a reduction of 3 percent in Cotton Fabric production.

Table 5.9: Dependent Variable: Jute Production

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNJUTE	-0.031325	0.023890	-1.311232	0.0095
C	-0.023398	0.042309	-0.553016	0.5884

Source: Author's calculations

The empirical result below shows that the relationship between the estimated value of cement production and GDP per capita income is negative and is statistically significant. The impact of estimated value of cigarettes and cotton fabric production on GDP per capita income is positive but is statistically insignificant; similarly the impact of natural gas production on GDP per capita income is negative and is statistically significant, while the estimated value of cotton yarn and GDP per capita income shows negative relationship and statistically significant and impact of estimated value of jute production on GDP per capita income is negative and is statistically insignificant. Gross fixed capital formation has positive impact on the production. 1 % rise in GFCF will cause an increase in 0.9% in economics growth. And it has statistical significant relationship with the economics growth.

Table 5.10: Dependent Variable: Economic Growth

Variable	Coefficient	Std. Error	t-Statistic	Prob.
eCement	-1.300059	0.244699	-5.312886	0.0130
eCigarettes	0.006995	0.057416	0.121825	0.9107
eCfabric	0.245901	0.351410	0.699754	0.5345
ECyarn	-1.640993	0.262783	-6.244673	0.0083
EJute	-0.822349	0.100662	-8.169420	0.0038
eNatural Gas	-2.938331	0.430635	-6.823255	0.0064
LNGFCF	0.909035	0.012144	74.85516	0.0000
C	124.8182	15.63488	7.983316	0.0041

Source: Author's calculations

5.2.4 Error-Correction Model for Cement Production

Error correction model is applied in order to analyze the short-run impact of taxation on the production of Cement. The result estimated in the table shows that the error correction coefficient is negative and is statistically significant at level which confirms the existence of co integration among the variables.

Table 5.11: ECM Cement Production

ECM Regression				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
CoinEq(-1)*	-0.495992	0.167376	-2.963335	0.0097
R-squared	0.339984		**Mean dependent var**	-0.002608
Adjusted R-squared	0.339984		**S.D dependent var**	0.087161
S.E of regression	0.070811		**Akaike info criterion**	-2.403657
Sum squared resid	0.085241		**Schwarz criterion**	-2.354192
Log likelihood	22.63292		**Hannan-Quinn critter**	-2.396837
Durbin-Wats on stat	1.922761			

Source: Author's calculations

5.2.5 Error-Correction Model for Cigarettes Production

Error correction model is applied in order to analyze the short-run impact of taxation on the Cigarettes Production. The result estimated in the table shows that the error correction coefficient is negative and is statistically significant at level which confirms the existence of co integration among the variables.

Table 5.12: ECM Cigarettes Production

ECM Regression				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(CigETR)	-1.219868	0.204183	-5.974383	0.0000
CointEq(-1)*	0.243239	0.075097	3.239014	0.0055
R-squared	0.691931		**Mean dependent var**	-0.012298
Adjusted R-squared	0.673809		**S.D dependent var**	0.194232
S.E of regression	0.110932		**Akaike info criterion**	-1.460499
Sum squared resid	0.209200		**Schwarz criterion**	-1.361084
Log likelihood	15.87474		**Hannan-Quinn critter**	-1.443674
Durbin-Wats on stat	2.481022			

Source: Author's calculations

5.2.6 Error-Correction Model for Natural Gas Production

Error correction model is applied in order to analyze the short-run impact of taxation on the Natural gas production. The result estimated in the table shows that the error correction coefficient is negative and is statistically significant at level which confirms the existence of co integration among the variables.

Table 5.13: ECM Natural Gas Production

ECM Regression				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
CointEq(-1)*	-0.245623	0.049449	-4.967194	0.0001
R-squared	0.520800		**Mean dependent var**	0.021502
Adjusted R-squared	0.520800		**S.D dependent var**	0.059891
S.E of regression	0.041459		**Akaike info criterion**	-3.477007
Sum squared resid	0.030940		**Schwarz criterion**	-3.427300
Log likelihood	34.03157		**Hannan-Quinn critter**	-3.468595
Durbin-Wats on stat	1.406477			

Source: Author's calculations

5.2.7 Error-Correction Model for Cotton Fabric Production

Error correction model is applied in order to analyze the short-run impact of taxation on the cotton fabric production. The result estimated in the table shows that the error correction coefficient is negative and is statistically significant at level which confirms the existence of co integration among the variables.

Table 5.14: ECM Cotton Fabric Production

ECM Regression				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
CointEq(-1)*	-0.248267	0.052407	-4.737295	0.0002
R-squared	0.484633		**Mean dependent var**	0.033964
Adjusted R-squared	0.484633		**S.D dependent var**	0.087812
S.E of regression	0.063039		**Akaike info criterion**	-2.638915
Sum squared resid	0.071532		**Schwarz criterion**	-2.589208
Log likelihood	26.06969		**Hannan-Quinn critter**	-2.630503
Durbin-Wats on stat	2.076203			

Source: Author's calculations

5.2.8 Error-Correction Model for Cotton Yarn Production

Error correction model is applied in order to analyze the short-run impact of taxation on the cotton yarn production. The result estimated in the table shows that the error correction coefficient is negative and is statistically significant at level which confirms the existence of co integration among the variables.

Table 5.15: ECM Cotton Yarn Production

ECM Regression				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(CyarnETR)	-0.014836	0.007161	-2.071863	0.0559
CointEq(-1)*	-0.113379	0.027930	-4.059342	0.0010
R-squared	0.464358		**Mean dependent var**	0.030289
Adjusted R-squared	0.432850		**S.D dependent var**	0.059980
S.E of regression	0.045171		**Akaike info criterion**	-3.257443
Sum squared resid	0.034686		**Schwarz criterion**	-3.158028
Log likelihood	32.94571		**Hannan-Quinn critter**	-3.240618
Durbin-Wats on stat	1.991737			

Source: Author's calculations

5.2.9 Error-Correction Model for Jute Production

Error correction model is applied in order to analyze the short-run impact of taxation on the Jute production. The result estimated in the table shows that the error correction coefficient is negative and is statistically significant at level which confirms the existence of co integration among the variables.

Table 5.16: ECM Jute Production

ECM Regression				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
CointEq(-1)*	-1.020177	0.255463	-3.993448	0.0012
R-squared	0.483159		**Mean dependent var**	-0.009530
Adjusted R-squared	0.483159		**S.D dependent var**	0.238737
S.E of regression	0.171632		**Akaike info criterion**	-0.632973
Sum squared resid	0.500780		**Schwarz criterion**	-0.583508
Log likelihood	6.696754		**Hannan-Quinn critter**	-0.626152
Durbin-Wats on stat	1.690619			

Source: Author's calculations

5.2.10 Error-Correction Model for Growth

Error correction model is applied in order to analyze the short-run impact of estimated value of production for each sector on the economic. The result estimated in the table shows that the error correction coefficient is negative for estimated value of Cement, Cotton Yarn, jute, Natural Gas Production and is statistically significant at level which confirms the existence of co integration among the variables. But error correction coefficient is positive for estimated value of Cotton Fabric and Cigarettes production and is statistically significant.

Table 5.17: ECM Economic Growth

ECM Regression				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(eCement)	-1.704805	0.082558	-20.64985	0.0002
D(eCIGARETTES)	0.100365	0.013079	7.673712	0.0046
D(eCOTTON FABRIC)	0.078041	0.147616	0.528677	0.6336
D(eCOTTON YARN)	-1.558956	0.135446	-11.50982	0.0014
D(eJUTE)	-0.880881	0.056336	-15.63624	0.0006
D(eNATURAL GAS)	-1.069185	0.153519	-6.964523	0.0061
CointEq(-1)*	-1.912557	0.054298	-35.22313	0.0001
R-squared	0.939638		**Mean dependent var**	0.100410
Adjusted R-squared	0.906714		**S.D dependent var**	0.041770
S.E of regression	0.012758		**Akaike info criterion**	-5.600056
Sum squared resid	0.001790		**Schwarz criterion**	-5.253801
Log likelihood	57.40051		**Hannan-Quinn critter**	-5.552312
Durbin-Wats on stat	2.157074			

Source: Author's calculations

5.3 Diagnostic Test

The diagnostic tests were estimated to check the serial correlation, normality, model's stability and heteroskedasticity. The p-value of all the tests must be greater than 0.05%. The results displayed for the variables passed all the diagnostic test of normality serial correlation and heteroskedasticity.

The serial correlation is determined by LM test (SANN & Lwin, 2017).H0 states that there is no serial correlation among the variables. The p-value of LM test for both estimated model is 0.1540 and 0.1323, greater than 0.05 therefore we will accept the H0 and confirms that data is white noise.

Ramsey proposed the RESET (Regression Specification Error Test) in 1969. The purpose of this test was to analyze whether the errors (Khan, 2016) in the model follow multivariate normal distribution. Since the p-values for the both estimated model are 0.3620 and 0.3443 i.e. greater the 0.05 which states that model is well specified and free from omitted variables. Similarly Jarque-Bera (JB) is used to detect normality. The results estimated shows that JB is greater than 0.05 which means data is normally distributed. The diagnostic test further confirms that no heteroskedicity is observed in the models i.e. 0.098, 0.09> 0.05. The ARCH test concludes that the error terms are white noise i.e. doesn't follow the specific pattern.

Table 5.18: Diagnostic Test

Test	Probability (Cement Production)	Probability (Cigarettes Production)	Probability (Natural gas Production)	Probability (Cotton fabric Production)	Probability (Cotton Yarn Production)	Probability (Jute Production)	Probability (Economic Growth)
Arch	0.23 (1.40)	0.78 (0.07)	0.20 (1.62)	0.91 (0.012)	0.91 (0.012)	0.5790 0.307874	0.07 (3.26)
White test	0.40 (0.55)	0.34 (5.64)	0.05 (9.72)	0.06 (10.3)	0.09 (15.02)	0.4797 (4.50)	0.21 (17.88)
LM	0.87 **(**0.02)	0.33 (0.92)	0.47 (0.50)	0.64 (0.21)	0.67 (0.17)	0.34 (0.88)	0.06 15.19
Jarque Bera	0.54	24.95	0.56	17.7	2.7	7.33	0.78
Ramsey Reset	0.81 **(**0.42)	0.42 (0.82)	0.09 (3.76)	0.056 (2.06)	0.10 (1.75)	0.87 (0.16)	0.1919 (1.94)

Source: Author's Calculation

5.3.1 Discussion

The study purposes to analyze the effect of effective tax rate on different corporate sectors of the economy and their corresponding impact of economic growth of Pakistan. In this study Autoregressive Distributed Lag model (ARDL) is applied for the long run analysis while Error Correction Model (ECM) is utilized for short run. And for the sensitivity analysis diagnostic test is applied which involves LM serial correlation test, Ramsey (RESET) test, Jarque-Bera (JB) and Arch and White test. Therefore the results show that the model can explain the short run and long run impact of taxation on the specific sector and their corresponding effect on economic growth

Pre-estimation tests such ADF is applied which demonstrates that all the variables are stationary at level I (0) and first difference I (1). Therefore it ensures that the time series data is stationary at mixed I(0), I(1) and ARDL method is the most appropriate approach. While the negative sign of error correction term also confirms the short run relationship among the dependent and independent variables.

The quantitative results suggest that Sales tax rate (effective tax rate) has both long-run and short-run impact on corporate sector and corporate sectors have corresponding significant impact on economic growth.

Coefficient on cement, natural gas, jute and cotton yarn's production with the negative sign indicates that the effective sale tax rates have negative impact on the cement, natural gas, jute and cotton yarn's production and these sectors ultimately have adverse impact on economic growth.

Further the empirical result show that effective sales tax rate have positive impact on Cigarettes and Cotton Fabric production and these sector eventually have positive impact on economic growth but the statistical analysis reveals that the p-vale of inflation is greater than 0.05 both for the production of Cigarettes and Cotton fabric (0.9 and 0.5 respectively) that means these sector has no significant impact towards economic growth. These results are consistent with the findings of the Larsson and Haq (2016): Riyanti and Phelivanoglu, (2018) and Oleka et al, (2015).

Gross fixed capital formation (GFCF) has positive impact on economic growth. This result is supported by the findings of the (Larsson and Haq), as if country will spend more on the investment if it saves more and which will further increase in the output. In this study the Gross fixed capital formation GFCF is a factor that positively adds to the economic growth.

Chapter 6

Methodology and Result for Corporate Tax Rate

In this chapter the study will briefly discuss the description of data and econometric methodology in details for corporate tax rate.

6.1 Brief overview of the Data

Table 6.1: The Detailed Data Description is as Follow

Variables	Symbol	Description	Source
GDP capita income at Factor cost	Y_t	GDP Per capita income at Factor cost in Million Rs	Pakistan Bureau of Statistics
Corporate tax rate	CTR	Corporate tax rate	Federal Board of Revenue
Consumer Price index	CPI	Consumer price index	Pakistan Bureau of Statistics
Trade Openness	TO	Trade Openness	Pakistan Bureau of Statistics
Control vector	X_t	Control vector, includes Trade Openness TO, and and Consumer Price index CPI at time t.	State Bank of Pakistan Pakistan Bureau of Statistics

6.2 Estimation Technique

In econometrics various con-integration techniques for instance Johansen (1988), Engle-Granger (1987), Peraran (2001) ARDL are used. This study has used time series and secondary data for the period 1980 to 2020 and applied regression model to investigate the short run and long run

effect of corporate tax rate on economic growth in Pakistan. This study deals with Quantitative dependent variables. Order of integration of all variable is evaluated separately, if we ignore the problem of unit root our result will lead to spurious result, after that if the data is stationary then we will proceeds to co-integration technique. We will use ARDL (Autoregressive Distributed lag) co-integration for both regression models. Firstly; a descriptive analysis will be made before the estimation of the models.

6.3 Model Specification for Corporate Tax Rate

Specifications are essential when accessing the possible relation among the variables. To analyze the impact of corporate tax rate on economic growth of Pakistan an empirical model is adopted. This study follows the work of (Khan 2016, Afzal et al. 2013 and Sann & Lwin, 2017) among others.

In the following equation Y is independent variable, f is the function and X is the vector of independent variable.

$$Y= f(X) \quad \textbf{(6.1)}$$

In order to determine the empirical relationship among the endogenous and exogenous variables the following equation is developed.

$$Y= f (CTR, X) \quad \textbf{(6.2)}$$

In the linear form

$$Y_t= \beta_O + \beta_1 CTR + \beta_2 X_t + \mu_t \quad \textbf{(6.3)}$$

Where GDP per capita at factor cost at time t, vector X shows the set of instrumental variables that includes Trade Openness TO and Consumer Price index CPI at time t. While the exogenous variable is corporate tax rate CTR (Percentage) at time t. β0 is the slope or constant while $\beta_1 - \beta_2$ are the coefficients of the explanatory varibles and μ_t is the error term. In the above equation we use the Fiscal Policy variable (Corporate tax rate) to find the dynamic effect of corporate tax rate on economic growth.

To covert the equation into more appropriate form, each variable will be transformed into natural logarithmic form as it will reduce the effects of heteroscedasticity in time series data.

$$\ln Y = \beta_O + \beta_1 CTR_t + \beta_2 lnX_t + \mu_t \qquad \textbf{(6.4)}$$

In econometrics various con-integration techniques for instance Johansen (1988), Engle-Granger (1987), Peraran (2001) ARDL and Johansen-Juselius (1990) are used. While in our study to investigate the long run and short run relation between corporate tax rate and economic growth, ARDL bound testing approach is utilized.

ARDL approach will be utilized with three steps. First stage involves the stationarity of the data through ADF method. The second stage involves estimating the model to analyze the long run and short run dynamics among the variables through ARDL. The third stage involves the diagnostic tests to confirm the model's goodness of fit.

6.4 Unit Root Test: Effect of Corporate tax rate on Economic growth

Time series data shows trending behavior. Therefore it is an obligation in econometrics is to determine the most suitable form of data trends

In many econometric time series data trending behaviors are observed and to remove these trends unit root tests are applied. Therefore we start out by testing the variables for non-stationarity. The pre-tests (unit roots) are the necessary before estimating the equation as non-stationary variables may not be used for regression unless co-integrated (Hystad et al, 2015).Therefore the Augmented Dickey Fuller (ADF) unit root is estimated for all the model variables.

The hypothesis for the ADF is given as

H0: Data is non-stationary i.e. there is unit root

H1: Data is stationary i.e. no unit root

The stationarity of the data can be interpreted through p-value. If the p value is greater than 5% then we will accept (see Khan 2016) the H0 i.e. presence of unit root. And if the estimated p value is less than 0.05 then we will reject the H0 and data confirm the no unit root means that data is stationary. Another assumption for the ARDL is that if the data follows the second order integration I (2) then this method cannot be applied. Therefore no variable should be I (2).

6.5 Formal Procedure for the ADF

$$\Delta X_t = \beta_0 + \beta_{1t} + \beta X_{t-1} + \sum_{j=1}^{p} \delta j \, \Delta \mathrm{Xt}_{t-1} + \mathrm{U}_t \qquad \textbf{(6.5)}$$

Where ΔX_t indicates the first difference and p denotes the lag order at time t. In ADF test when H0 is rejected i.e. X variable is non-stationary (see Khan 2016) and($H_0 : \beta = 0$) if β is significantly negative.

When the model shows non-stationary results at level then they are transformed into first difference and then the null hypothesis is tested to achieve the stationarity. One of the

assumptions of the ARDL bound test is that (see Khan 2016, Lwin 2017) all the variables must be integrated at I(0) and I (1) not at I (2) as when the data follows the I (2) order ARDL bound model will yield spurious results.

6.6 Autoregressive Distributive Lag (ARDL) Approach to Co-integration

The next step after estimating the level of integration of all the variables is to analyze the short run and long run dynamic relationship among the variables. Therefore to analyze the presence of co-integration we apply the bound test ARDL approach. Thus the relationship among the corporate tax rate and economic growth is evaluated through ARDL bound testing approach. The ARDL method was developed (see Haq & Larsson, 2016) by Pesaran & Shin in 1998 and further modified in 2001 by Perasan et al. In analyzing co-integration and long run relations this method is preferred over traditional statistical methods due to its several advantages (Haq & Larsson 2016, Khan 2016, Afzal et al. 2013) such that ARDL may be applied for the combined I (0) and I (1) as well as for I (1) and I (0) while Engle and Johansen tests cannot be applied for the mix level co-integration. On other side, for the higher order integration I (2), this method (ARDL) will reveal spurious results. Many co-integration techniques such as Johansen and Engle tests are sensitive to the sample size while ARDL is the robust methodology for the small sample sizes (Haq & Larsson, 2016). Financial time series is often the combination of I (0) and I (1) therefore this method is quite advantageous. Furthermore the ARDL explains the short run impact without dropping the long-run information by using error correction method. Although long run and short run impact can be assessed simultaneously.

In the light of the proposed advantages, ARDL method is utilized in our study to access the long run and short run impact of the macroeconomic variables to check the effect of corporate tax rate on economic growth.

6.7 The ARDL model of f(X)

$$\Delta lnY_t = \beta_O + \sum_{i=1}^{q} \beta_1 \Delta CTR_{t-1} + \sum_{i=0} \beta_2 \ln \Delta X_{t-1} + \mu_t \qquad \textbf{(6.6)}$$

In econometrics various con-integration techniques for instance Johansen (1988), Engle-Granger (1987), Peraran (2001) ARDL and Johansen-Juselius (1990) are used. While in our study to investigate the long run and short run relation between corporate tax rate and economic growth, ARDL bound testing approach is utilized.

ARDL approach will be utilized with three steps. First stage involves the stationarity of the data through ADF method. The second stage involves estimating the model to analyze the long run and short run dynamics among the variables through ARDL. The third stage involves the diagnostic tests to confirm the model's goodness of fit.

6.8 ECM

The next stage involves the Error Correction Model ECM which determines the causal relation among the variables propounded by Engle and Granger (1987). When the co-integration is present, the ECM should be negative (Khan 2016) and significant as well as the value of ECM should be higher. Long run causality is determined through negative statistical ECM while short run causality is explained by the significance of the lagged explanatory variables.

ECM for the model given as:

$$\Delta lnY_t = \beta_O + \sum_{i=1}^{q} \beta_1 \Delta CTR_{t-1} + \sum_{i=0} \beta_2 \ln \Delta X_{t-1} + \gamma ECM_{t-1} + \mu_t \quad \textbf{(6.7)}$$

Δ Represents the difference operator, while γ should exhibit the negative significant sign (Alimi 2014) to confirm the long run relation. The null hypothesis for the variable is given as: H_0: $\beta_1 = \beta_2 = 0$ and the alternative is: H_1: $\beta_1 = \beta_2 \neq 0$. F-statistics are used for testing the hypothesis.

6.9 Sensitivity Analysis

The diagnostics tests such as Ramsey test, ARCH, Jarque-Bera (JB) and LM test will be applied under the sensitivity analysis to ensure the validity of the data used in the model.

6.10 Results and Discussion

6.10.1 Descriptive Statistics

The table below covers summary of descriptive statistics about the variables. Each variable has twenty total numbers of observations with annual time series data from 1980-2020. The average of GDP per capita income at factor cost 'Y' is 11.39 with std. dev. is 0.68. Average and std. dev. of other variables such as corporate tax rate (CTR) is 35.15 and 4.65 respectively. Further the Jarque-Bera test used for normality states that the probability value of Jarque-Bera (JB) is greater than 0.05 which means that all the variables are normally distributed.

Table 6.2: Descriptive Statistics

	CTR	TO	CPI	Y
Mean	35.15714	-1.131115	8.163158	11.39506
Maximum	45.15000	-0.954530	20.28612	12.41477
Minimum	29.0000	-1.374120	2.529328	10.32568
Std. Dev.	4.650411	0.112600	3.763079	0.681802
Skewness	1.136233	-0.630452	0.675493	-0.172624
Kurtosis	3.741608	2.545800	3.770034	1.627708
Jarque-Bera	4.999828	3.068467	4.130948	1.835516
Probability	0.082092	0.215621	0.126758	0.399413

Source: Author's Estimation

6.10.2 Stationary-Test for Variables

6.10.2.1 Empirical Results

Before going for any analysis, it is necessary in econometrics to determine the relationship among the variables. Therefore to investigate the stationarity of the data ADF test would be applied. The results are summarized in Table 1. It can be noticed that natural log of some variables exhibit non-stationarity therefore to convert into I (1), first difference form may be used i.e. we evaluate the impact of independent variables on the economic growth variables, not level.

The ADF test is performed both in level I (0) and differenced forms I (1) with and without the trends i.e. with and without the intercept (γ). Some of the variables exhibit the stationarity at level (when adjust for trend) and some at first difference I (1) and no presence of higher order integration I (2) in our time series.

Corporate tax rate is the main explanatory variables used in this study. Some variables are either I (0) or I (1) at the trend term for instance in case of Corporate tax rate is I (1) at no trend and I (0) at trend while the instrumental variables Consumer Price Index 'CPI' and Trade Openness 'TO' are stationary at I (1). Therefore the ARDL is most appropriate methodology for our model in contrast with other models for instance Johansen's test that is only appropriate for the variables (Haq & Larsson, 2016)

Table 6.3: Augmented Dickey Fuller Test (ADF)

	Level		First Difference	
Variable	**Intercept**	**Trend and intercept**	**Intercept first difference**	**Trend and intercept**
CTR	-1.286992	-3.593414	-4.370191	-4.070549
LNTO	-1.647531	-3.734854	-3.509056	-3.342727
LNCPI	-2.048609	-1.986477	-4.959230	-4.824341
LNY	-0.584742	-0.911849	-1.875656	-3.300841

Note: (1) Null Hypothesis H0= Data is non-stationary i.e. existence of unit root. H1 Data is stationary i.e. has no unit root. (2) Rejection of null hypothesis H0 (i.e. p value less than 0.05) (3) Significance level 1%, 5%, 10%

Source: Author's Estimation

6.10.3 Short-Run and Long-Run test

To evaluate the long run and short run relation among the model variables ARDL is applied on the entire period from 1980-2020. The below table shows the statistics summary of ARDL bound test. The ARDL bound test estimation involves the two stages (..) . the first stage consists of testing the co-integration relationship among the variables. Further the long run relation is established when the lagged values of the variables are statistically significant. This will lead us to the 2nd stage which consists of estimating the long run and short run co-efficient of ARDL model. If the F-statistics estimated value is less than then the lower bound critical value (Makuyana & Odhiambo 2017, Afzal et al. 2013) then the H0 will be accepted i.e. no co-integration will be accepted i.e. not significant therefore establishing no long run relation. Further if the F-statistics value occurs between upper and lower bound critical values then the results will become inconclusive. The value of the F-statistics depends on the sample size, explanatory variables and constant/trend of ARDL.

Error correction model is used to capture the short run dynamics of the variables in first differenced form. Table below summarizes the long run bound test. The F-bound test statistics

show that the performance variables share the long run relationship. These results of long run relationship support the findings of other studies such as Haq & Larsoon, 2016, Afzal et al, 2013, and Khan 2016.

6.10.4 Long-run Estimation Results

Table 6.4: Long run form and Bound test

Dependent Variable	Function	F-Statistics	Co-integration status
GDP per Capita Income	F(CTR,TO,CPI)	7.294893	Co-integrated

Source: Author's estimation

The empirical results show that the relationship between the economic growth and corporate tax rate is negative and is statistically significant. Whereas the long run tests estimates shows that a 1% increase in corporate tax rate will reduce the economic growth by 3%. While the impact of corporate tax rate on economic growth is significant at 5%. A. Similarly the impact CPI on economic is positive. A 1% rise in CPI will lead to increase economic growth by more than 1% and statistical significant relationship with the economic growth.

Trade Openness and economic shows the negative relationship. The estimated coefficient shows that the long run relation between Trade openness and Economic growth is statistically significant.

Table 6.5: Dependent Variable: GDP per Capita Income

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CTR	-0.038710	0.013506	-2.866166	0.0074
CPI	0.964305	0.145508	6.627191	0.0000
TO	-1.421778	0.564496	-2.518668	0.0172
C	6.725327	1.187179	5.664963	0.0000

Source: Author's estimation

6.10.5 Error-Correction Model

Error correction model is applied in order to analyze the short-run impact of corporate tax rate on the economic growth. The result estimated in the table shows that the error correction coefficient is negative and is statistically significant at level which confirms the existence of co integration among the variables. Therefore it assures that there exists the long run relationship among the variables such as GDP per capita income, corporate tax rate, CPI and TO. In the short run changes in the corporate tax rate will have negative impact on the GDP per capita income. Further the Durbin-Watson test confirms the non-existence of autocorrelation.

Table 6.6: ECM

ECM Regression				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(CORPORATE_TAX_RATE01)	-0.001330	0.002279	-0.583460	0.5638
D(CORPORATE_TAX_RATE01(-1))	0.007491	0.002409	3.109200	0.0040
D(LNCOSUMER_PRICE_INDEX)	1.076301	0.098680	10.90694	0.0000
CointEq(-1)*	-0.268583	0.041853	-6.417222	0.0000
R-squared	0.449165		**Mean dependent var**	0.107676
Adjusted R-squared	0.401950		**S.D dependent var**	0.060134
S.E of regression	0.046503		**Akaike info criterion**	-3.201665
Sum squared resid	0.075690		**Schwarz criterion**	-3.031043
Log likelihood	66.43247		**Hannan-Quinn critter**	-3.140447
Durbin-Wats on stat	1.843914			

Source: Author's estimation

6.11 Diagnostic Test

The diagnostic tests were estimated to check the serial correlation, normality, model's stability and heteroskedasticity. The p-value of all the tests must be greater than 0.05%. The results displayed for the variables passed all the diagnostic test of normality serial correlation and heteroskedasticity.

The serial correlation is determined by LM test (SANN & Lwin, 2017).H0 states that there is no serial correlation among the variables. The p-value of LM test for both estimated model is 0.37 and 8.41, greater than 0.05 therefore we will accept the H0 and confirms that data is white noise.

Ramsey proposed the RESET (Regression Specification Error Test) in 1969. The purpose of this test was to analyze whether the errors (Khan, 2016) in the model follow multivariate normal distribution. Since the p-values for the both estimated model are 0.70 and 0.38i.e. Greater the 0.05 which states that model is well specified and free from omitted variables. Similarly Jarque-Bera (JB) are used to detect normality. The results estimated shows that JB is greater than 0.05 which means data is normally distributed. The diagnostic test further confirms that no heteroskedicity is observed in the models i.e. 0.21, 7.09> 0.05. The ARCH test concludes that the error terms are white noise i.e. doesn't follow the specific pattern.

Table 6.7: Diagnostic Test

Test	Probability (GDP Growth)
Arch	0.10 (2.62)
White test	0.21 (7.09)
LM	0.37(8.41)
Jarque Bera	5.74
Ramsey Reset	0.70(0.38)

Source: Author's Calculation

6.12 Discussions

The study analyzes the impact of corporate tax rate on the economic growth of Pakistan. While 'CPI' and Trade Openness 'TO' are the instrumental variables for the period 1980-2020. Autoregressive Distributed Lag model (ARDL) is applied for the long run analysis while Error Correction Model (ECM) is utilized for short run. And for the sensitivity analysis diagnostic test is applied which involves LM serial correlation test, Ramsey (RESET) test, Jarque-Bera (JB) and Arch and White test. The results show that the model explains the short run and long run impact of tax structure on the economic growth of Pakistan.

Pre-estimation tests such ADF is applied which demonstrates that all the variables are stationary at level I (0) and first difference I (1). Therefore it ensures that the time series data is stationary at mixed I(0), I(1) and ARDL method is the most appropriate approach. While the negative sign of error correction term also confirms the short run relationship among the dependent and independent variables.

Moreover the quantitative results suggest that corporate tax rate has significant impact on economic growth. The coefficient on corporate tax rate with the negative sign indicates that the economic growth improves with the decline in the corporate tax rate.

The impact of instrumental variable (CPI), Consumer price index on the economic growth is significant with the positive relationship. The statistical analysis reveals that the p-value of inflation is less than 0.05; it means that inflation has statistically significant impact towards the economic growth. These results are consistent with the findings of the Larsson and Haq (2016): Riyanti and Phelivanoglu, (2018) and Oleka et al, (2015).

Trade Openness (TO) have a negative impact on economic growth, this result is supported by the findings of the Larsson and Haq (2016), in this study Trade Openness is a factor that has adverse effect to the economic growth. Mallick and Behera (2020) investigate long-run equilibrium relationship between economic growth and trade openness in India during the period 1960–2018 using the asymmetric error-correction model with threshold cointegration and conclude that economic growth and trade openness have significant exhibit asymmetry relationship. Afzal and Hussain (2010) find no causal relationship between exports and economic growth as well as between imports and economic growth in Pakistan. However Chang et al. (2009) report a positive relationship between trade openness and economic growth. Openness to trade has negative effect on growth in countries with low financial development, but has insignificant impact in countries with high financial development. Trade openness is conducive to economic growth in low-inflation countries but has insignificant impact on growth in high-inflation countries Keho and Wand (2017). This is an empirical phenomenon commonly observed in Pakistan's case where growth is accompanied with current account deficit.

Chapter 7

Qualitative Analysis

7.1 Qualitative Analysis

The research is conducted through both qualitative and quantitative approach. However in this research qualitative approach uses interview techniques. Interview has been conducted of officials working in FBR and Economic Wing of Pakistan. This chapter discusses the methods to obtain results for our objectives.

7.1.1 Research Design

This study uses the descriptive research design. This type of research design is used when we want to describe the special behavior, Deals with the questions how, how many, who and what.

7.1.2 Research Method

Research methods are the ways through which information is collected. Therefore, our qualitative research strategy uses semi structure interviews to get in depth analysis.

7.1.3 Pretesting and Sample Selection

On the basis of quantitative analysis work is done on tax structure (corporate tax rate and effective sales tax rate) and performance of corporate sector and their corresponding impact of economic growth. The survey was pre-tested through a Pilot survey and then it was refined. The Key respondents were mainly targeted from Ministry of Industries, FBR and Economists at PIDE. The interviews method was adopted followed by an Open ended discussion. The respondents were having relevant experience on tax structure and related issues.

7.1.4 Semi-Structured, Open-ended interviews

Open-ended questionnaires were used for interviews with experts. The participants were experts from Federal Board of Revenue (FBR) and Ministry of Industries and Production. The interview focused on the questions that link the economic growth with the corporate sectors and tax structure.

The following section presents the interview discussions with the experts.

Tax structure impact on the Corporate Sectors

The results of the interview showed that several economic conditions such as corruption, industry cartelization, unfriendly tax policy structure and intervention of western interests impede the progress of the industries.

Who benefits more from the tax system?

Some industries for instance textile sector is provided high government assistance through tax exemption as it contributes in our exports. While other sectors e.g. cement, LNG and tobacco are provided less attention.

What is the behavioral impact of taxes on business side?

On production side, only profit margins are considered, industry associations (Mafias) pressurize the government to make policies that best suits them. On contrary, when the policies do not favor the associations, challenges like supply demand gap is created.

Tax allocation mechanism to each sector

The interviewees responded that, textile sector is export oriented. To boost the textile industry government introduced the reduced taxes to this sector. Further, cement sector is also exposed to low tax system. However, in the Tobacco sector government mainly focused on FED rather than sales tax.

On asking about tax concession misuse, the interviewee revealed that may sectors provide the campaign fund to the political parties. Therefore in return, these political bodies offer them tax exemptions.

Tax mix structure in each sector

The interviewees responded that there is not define fixed ratio for tax mix structure. Government often increase taxes to the non-inflationary side (indirect taxes) and try to minimize the inflationary taxes (direct taxes)

How to Capture Grey Economy into tax bracket

Grey economy would not be included in the tax net because they possess less revenue and compliance cost.

Role of government intervention in formulating tax system

It was also proposed by some interviews that government intervention should be kept minimum, let the market decide it self. Sometimes government itself creates the obstacles for industrial growth.

Why tax structure is non-identical in all Provinces?

On asking about different tax structure of Pakistan, it was revealed by interviewees that after 18th amendment the provincial tax system is different.

The evidence from the interview survey further identified that most of the policies are formulated under the IMF and World Bank framework and therefore all the industries cannot enjoy the identical tax structure. In order to follow the IMF directions, tax credits are favored as the IMF is against the tax reduction/exemption policy. Therefore in the light of these decisions sales tax exemptions are reduced to the greater extent. On the other hand, in order to support the particular industry, tax exemptions are provided to the special economic zones and technology zones.

Impact of taxes on growth

Pakistan is developing country; therefore the interviewees suggested that the ratio of tax to GDP must be low so the taxes will be in balance. Further the high proportion of taxes lead to the creation of underground economy.

On asking about high corporate and sales tax, the interviewee revealed that government is trying to reduce the corporate taxes but due to the IMF regulations taxes could not be reduced. However, the corporate sectors maintain the high profit margins and shift the burden towards the consumers. This statement is supported by the findings of the Haque (2020) in which he quoted. Our top priority in a series of IMF programs has been to increase taxation.

7.2 Conclusion of Qualitative Analysis

Each sector is introduced to the different tax system. However, the sectors which yield the high revenue are provided with the tax concessions such as textile and cement because they add valuable contribution the GDP. Moreover, the sectors for instance tobacco and natural gas are exposed to the low effective sales tax. Not only the government intervention impact the sectors performance while other factors such as currency fluctuations, inflation, rent seeking activities and external forces (IMF, World Bank) impact the sectorial growth.

It was recommended that a flat tax structure should be levied to all the corporate sector since the un-identical tax system bring rent seeking activities and hence it is difficult to monitor due to lack of transparency

CHAPTER 8

Conclusion

8.1 Conclusion

In the view of analysis, the performance of the domestic corporate sectors is coupled with low quality and performance, literature studies shed light on the historical background of the these corporate sectors illustrates that the initial industrial state of the country was inert. Although government introduced several policy initiatives and the sector enjoyed the high protection rate in order to nurture the domestic industry.

However the domestic industry still deficient in establishing a competitive product and adapting innovative strategies to catch up with the market leaders. The analysis of the corporate sectors (Cement, Cigarettes, Textile and Natural Gas) on Effective tax rate showed that it is negatively correlated and statistically significant. On the other hand the results concluded that corporate tax rate also has adverse impact on Economic growth.

It is clear from the research that the tax variables are important factors in determining the performance of the corporate sector and economic growth of a country. In context of effective tax rate and corporate tax rate countries all around the world have recognized that high tax rate has adverse impact on corporate sectors, In a response to this countries all around the globe has decline these taxes but Pakistan is still have higher tax rates than the average global tax rate, The world is transforming towards the higher technology penetration therefore the industrial structure needs constant aggrandizement. Product development, technology infringement and well-structured Tax policy frameworks are the some key ingredients to attain the global integration.

8.2 Policy Recommendation

In order to inspect the impact of (Tax structure) fiscal policy variable on the performance of corporate sectors (Cement, Textile, Natural Gas and cigarettes) and their corresponding effect on economic growth, an in depth analysis is made which proclaimed that growth in these sectors is linked with the efficient business units for instance the high tax rate policy, which are sector specific, creates inefficiencies.

Therefore, the government could respond in the market through uniform tax structure for instance the tax policy must not favor specific sector, which is crucial in determining the competitiveness in the international markets. And government should reduce corporate tax rate by following the global tax structure policy framework.

Further the small sized firms due to the lack of resources and financial constraints are unable to adopt the managerial skills required to achieve competitiveness. And these high tax rates also create more burdens on the financial decisions of these firms.

The policy related to the knowledge spillover and labor skills up gradation are necessary. Further government should set the local content requirement.

These corporate sectors are very sensitive to the business fluctuations. In the time of economic crisis, Consumer confidence is declined thereby hitting the industries and markets followed by the decrease in sales and production of corporate sector.

Therefore to pull these corporate sectors from the crisis hit market and avoid the output contraction, industrial policies involves, stimulating the demand and innovation projects are

crucial. Further the government can also respond to this crisis by providing incentives to relocate the resources within the country as well outside the country.

To deal with the complex tax structure of the corporate sector with several exemptions and tax evasion, a flat tax system should be introduced for all corporate sectors instead of preferential tax structure providing companies with the free economic and industrial zones. This will also induce the regional competition.

The corporate sectors of Pakistan could be expanded through bilateral and free trade agreements (FTAs). Through central government planning and with firms‟ enrollment, industrial hubs and clusters must be developed, while the active involvement of employees, business associations, R&D centers and universities is necessary.

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